Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms

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Executive Summary

Energy efficiency is one of the lowest-cost, cleanest, most reliable options available to utilities to meet customer demand. Yet a number of historical regulatory practices have combined to impede the use of energy efficiency as a resource, and the ability to address some of those practices has played a crucial role in the expansion of utility efforts regarding customer energy efficiency programs.

York et al. (2013) list the three main disincentives to utility investment in energy efficiency:

1. The costs of efficiency programs constitute financial losses to utilities unless they are able to recover those costs through rates or fees.
2. Investments in capital assets like power plants provide a return on investment under the traditional utility business model. Expenditures on energy efficiency programs avoid the need for these capital investments but do not provide a return.
3. The traditional utility business model is based on a throughput incentive, whereby utilities earn more profits by selling more electricity. Investments in energy efficiency drive down energy use and therefore utility revenues. However efficiency does not reduce the short-term, fixed costs of providing service.

State regulators have sought to address these three major disincentives through particular adjustments to utility regulatory frameworks. This paper examines one mechanism meant to deal with a utility's disincentives to invest in energy efficiency: a *lost revenue adjustment mechanism (LRAM)* or *lost contribution to fixed costs (LCFC)*. An LRAM is a rate adjustment mechanism that allows a utility to recover revenues that are reduced specifically as a result of energy efficiency programs.

States often use LRAM as an alternative to decoupling. Decoupling is a mechanism that makes small adjustments to rates and breaks the link between the amount of electricity or natural gas utilities sell and the revenue they are allowed to recover. Rates vary so that revenues—regardless of sales—are fully recovered. With decoupling in place, a utility is indifferent to changes in sales due to any factor, including efficiency programs or weather patterns.

LRAM differs from decoupling in two key ways. First, LRAM requires a utility to estimate energy savings over a given time period. Decoupling requires no such estimation. Second, LRAM is typically not symmetrical. That is, while a utility can recover lost revenues from efficiency programs, regulators do not make additional adjustments if the utility sells more energy than predicted in the test year. Decoupling is symmetrical and can result in both customer refunds and surcharges.

In recent years, many states have adopted the LRAM approach to address utilities' throughput incentive. In 2011, an ACEEE paper detailed the experience of several states with LRAM in place. Since that time, more states have adopted this type of regulatory mechanism, and many states have had several years of experience with it. Currently, 17 states have LRAMs in place for at least one major utility. At the same time, however, several states that had LRAM policies in the past have moved toward decoupling.

ANALYSIS OF CURRENT LRAM POLICIES

We asked states to submit information on their LRAM policies, lost revenue dollars eligible for recovery by utilities in the two most recent program years, and program costs and annual savings from energy efficiency programs for each of those years. Fifteen states responded with quantitative data.

The amount utilities were eligible to recover for electricity savings ranged from $0.02 per kWh to $0.13 per kWh, with a median of $0.05 per kWh. For natural gas, eligible recovery amounts ranged from $0.09 per therm up to $0.33 per therm, with a median of $0.19 per therm. This range speaks to differences in base rate designs and lost revenue calculation inputs for the states and utilities profiled, as well as the effect of pancaked savings, i.e., the compounding of savings from measures installed in multiple years.

LRAM dollars also varied in comparison with program costs for the electric utilities we surveyed. At the low end of the range, dollars collected for lost revenue were equivalent to only about 1% of electricity efficiency program costs in a given year. However for one utility surveyed, lost revenues recovered were equivalent to more than 70% of program costs. In this case it is likely that several years of recovery were rolled into a single rate case.

LESSONS LEARNED

An LRAM can bring parties to the table. Decoupling, or the separation of energy sales from a utility's profit calculation, is the simplest way to ensure that a utility meets its revenue requirement even if other factors dampen sales. But in many states, key parties view decoupling unfavorably. While LRAM is not a perfect substitute for decoupling, it can bring parties to the table in circumstances where decoupling is not feasible. LRAM can serve as a first-step policy solution on the way to decoupling.

Good evaluation, measurement, and validation (EM&V) is important. To prevent overcharging customers or undervaluing a utility's lost revenues, utilities and regulators need to get the savings right. Evaluation of savings is controversial in many of the states in which we conducted interviews. Though evaluation procedures were already in place for efficiency programs in many states, when lost revenues were at stake the scrutiny became far greater. It is important that all parties understand and agree to evaluation procedures. The evaluation process should be rigorous and transparent, with appropriate checks along the way.

Timing matters. Timing is critical to precise, efficient implementation of an LRAM. Since energy efficiency program decisions and rate-making decisions are necessarily intertwined in states with an LRAM in place, aligning these two functions to occur at the same time can help streamline processes. Intervals between rate cases also matter. Frequent rate cases avoid the issues associated with pancaked savings.

An LRAM alone will not fully incentivize efficiency nor remove the throughput incentive. While the lost revenue adjustment can help make a utility whole by compensating it for reduced energy sales associated with efficiency programs, it will do little to *encourage* investment in energy efficiency unless combined with other policy levers. In fact, our analyses indicate that having an LRAM policy itself is not currently associated with higher levels of energy

efficiency effort (program spending) or achievement (energy savings) than are found in states without an LRAM policy. Nor does LRAM reduce a utility's motivation to increase sales (although some states do have safety nets in place). To fully remove the throughput incentive, decoupling should be considered. Regulators can prioritize energy efficiency by setting energy savings targets through an energy efficiency resource standard (EERS) and implementing performance incentives tied to specific energy saving levels. They can also help encourage efficiency investments by requiring utilities to evaluate energy efficiency in the same manner as other supply-side resources during resource planning.

CONCLUSION

Creating a regulatory environment that incentivizes utilities to invest in efficiency is critical for programs to be successful, impactful, and long lasting. Doing so requires a mix of policy tools. In addition to energy efficiency targets, utilities need a business model that aligns their financial interests with energy efficiency, including program cost recovery, performance incentives that encourage utilities to achieve high levels of savings, and some policy mechanism to neutralize the throughput incentive. It is our opinion that decoupling is the best third leg of this stool. However it is also clear that decoupling is not always an option for states for a variety of reasons. In such scenarios, LRAM can be a temporary solution, offering a mechanism to address the concern over lost revenues and, possibly, help make parties more comfortable with the idea of full decoupling in the future.

Introduction

Utilities and regulators are making major changes to the utility industry across the country. As utilities try to become more service oriented, they are paying more attention to alternative business models, particularly those that value investments in energy savings. Energy efficiency is one of the lowest-cost, cleanest, most reliable options available to utilities to meet customer demand. Saving energy offers a wealth of opportunities for both utilities and the public. Investments in energy efficiency can reduce energy costs for families and businesses, create jobs, and improve the environment. Efficiency programs can help consumers control how and when they use energy, and they can help utilities build friendlier, service-oriented relationships with their customers.

Utility investments in energy efficiency have greatly increased since the mid-2000s. In 2004, utilities nationwide invested slightly less than $1.5 billion in energy efficiency programs. By 2014, investments had jumped to $7.7 billion (Gilleo et al. 2014). A variety of factors spurred this investment. Utilities were searching for cheaper ways to meet rising demand, states were looking for cleaner energy options for businesses and residents, and consumers wanted to reduce their utility bills.

A number of historical regulatory practices have combined to impede the use of energy efficiency as a resource. In order to address these barriers, states have adopted regulatory mechanisms to incentivize utilities to include energy efficiency in their portfolios. These adjustments to the traditional business model have played a crucial role in the expansion of utility energy efficiency programs.

TRADITIONAL REGULATION AND ITS PITFALLS

It is an unfortunate fact that the traditional utility business model conflicts with the objective of increasing customer energy efficiency. Traditional utility regulation structures developed with a focus on raising large amounts of capital to build the giant power plants and massive transmission and distribution network that we have in place today. Despite shifts in the energy industry in recent years, including far more emphasis on distributed resources and energy efficiency, the traditional utility regulatory structure is still generally in place, with little variation from state to state (York and Kushler 2011).

Utilities and regulators have historically set rates for electricity or gas sales through adjudication processes called rate cases. First they set revenue requirements by aggregating all of the utility's costs of providing service. They then calculate the rates necessary to recover these costs plus some reasonable return to the utility. Traditional regulation relies on two basic formulas (RAP 2011):

Revenue requirement = *Expenses* + *Return* + *Taxes*
Rate = *Revenue requirement/Units sold*

This traditional business model gives a utility the incentive to sell more electricity or natural gas. If it can sell more units of energy than were used to calculate its rate, the utility can earn more than its base revenue requirement.

This underlies one of the three disincentives to utility investment in energy efficiency under the traditional regulatory approach as described by York et al. (2013):

1. The costs of efficiency programs constitute financial losses to utilities unless they are able to recover those costs through rates or fees.
2. Investments in capital assets like power plants provide a return on investment under the traditional utility business model. Expenditures on energy efficiency programs avoid the need for these capital investments but do not provide a return.
3. The traditional utility business model is based on a throughput incentive, whereby utilities earn more profits by selling more electricity. Investments in energy efficiency drive down energy use and therefore utility revenues. However efficiency does not reduce the short-term fixed costs of providing service.

Despite these disincentives, state regulators and other stakeholders across the country see value in efficiency investments, and they have been working with utilities to adjust the traditional business model in ways that encourage them. Utilities are key partners in delivering efficiency, and states need to get them on board to maximize energy savings. The traditional business model is not going to work for the utilities of the future.

COMMON STRATEGIES FOR BALANCING INTERESTS

State regulators have sought to address the disincentives to energy efficiency investments through adjustments to utility regulatory frameworks.

Program cost recovery is a widespread regulatory practice that allows utilities to recover the costs of energy efficiency programs through rates. Efficiency program costs are typically treated as pass-through expenses which the utility may recover by adding a surcharge to the rates it charges customers. Alternatively the costs may be capitalized and the utility may raise rates to earn a return on the money it invested in efficiency

Performance incentives offer utilities financial rewards for saving energy through efficiency programs. Incentives make these programs into a source of earnings rather than just pass-through expenses. This puts energy efficiency investments on a comparable footing with investments in new power plants or transmission and distribution, which are allowed to earn a rate of return. Performance incentives help make up for the earnings opportunities utilities forego when, due to energy efficiency, they do not need to invest as much in their supply infrastructure. The companion report to this one (Nowak et al. 2015) discusses incentive designs, which vary widely.

Decoupling is the most straightforward solution to the throughput incentive. It breaks the link between the amount of electricity or natural gas the utility sells and the revenue it is allowed to take in (RAP 2011). Under decoupling, a utility is guaranteed to earn a specific amount, no more, no less, regardless of how much energy it sells. Its revenue is based on a regulatory formula rather than on the amount of energy its customers use. Revenue requirements are established in rate cases, and then decoupling true-ups occur outside of these cases. True-ups make small adjustments to rates based on actual sales. If the utility sells more energy than projected, it is required to refund customers. If it sells less, it is allowed to raise rates to reach its revenue requirement. Under decoupling, a utility is

indifferent to changes in sales due to any factor, whether weather, efficiency programs, or anything else. Decoupling is in place in about half of the states for electric or natural gas utilities or both (Morgan 2013).[1]

As an alternative to decoupling, many states have opted to address the throughput incentive with a different regulatory tool—a *lost revenue adjustment mechanism (LRAM)* or *lost contribution to fixed costs (LCFC)*.[2] Under LRAM, a utility is allowed to recover revenues it has lost, not just due to any cause (as with decoupling) but specifically as a result of energy efficiency programs. Regulators calculate the energy savings associated with the efficiency measures installed. They then allow the utility to recoup the revenues it has lost due to those energy savings. Figure 1 shows how LRAM addresses a revenue shortfall.

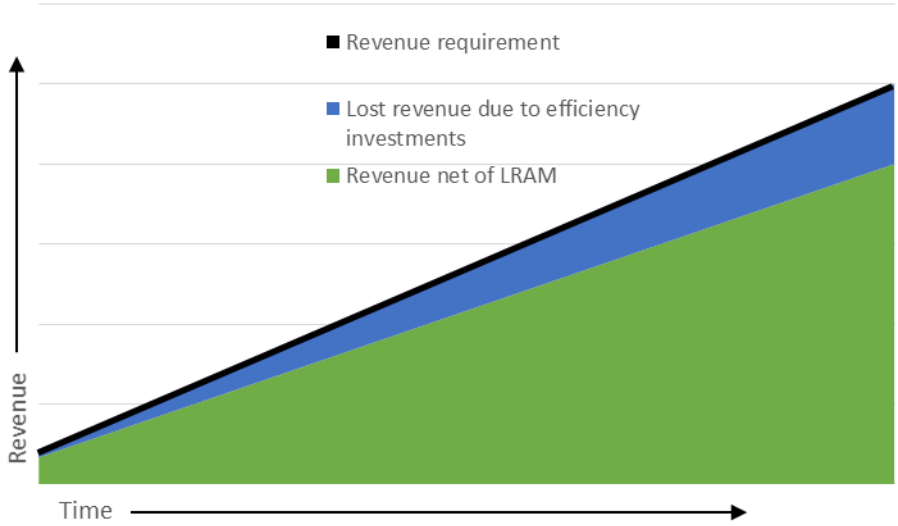

Figure 1. Theoretical application of LRAM to address revenue shortfall. A utility's revenue requirement is shown in black. In a traditional utility business model, savings from efficiency investments eliminate potential energy sales, thereby reducing a utility's revenue (shown in green). Under the LRAM approach, a utility calculates these savings and is able to capture lost revenue, shown in blue.

There are key distinctions between LRAM and decoupling. First, LRAM requires a utility to estimate energy savings resulting from efficiency programs over a given time period.[3] Decoupling requires no such estimation because its adjustments are based on actual sales volume (which is easily observable) rather than projected savings. Second, unlike decoupling, LRAM is typically not symmetrical. As discussed above, decoupling results in customer refunds if the utility sells more energy than expected, and surcharges if it sells less. With LRAM, the utility may recover revenues lost due to efficiency programs, but

[1] We consider a state to be decoupled when the mechanism is in place for at least one major utility.

[2] We use the term LRAM throughout this paper, although there are other names for this mechanism.

[3] In practice, states estimate energy savings to varying degrees, with some putting greater focus on evaluated savings than others.

regulators do not make adjustments if the utility sells more energy than predicted in the test year. Figure 2 illustrates the potential for over-earning built into the structure of LRAM.

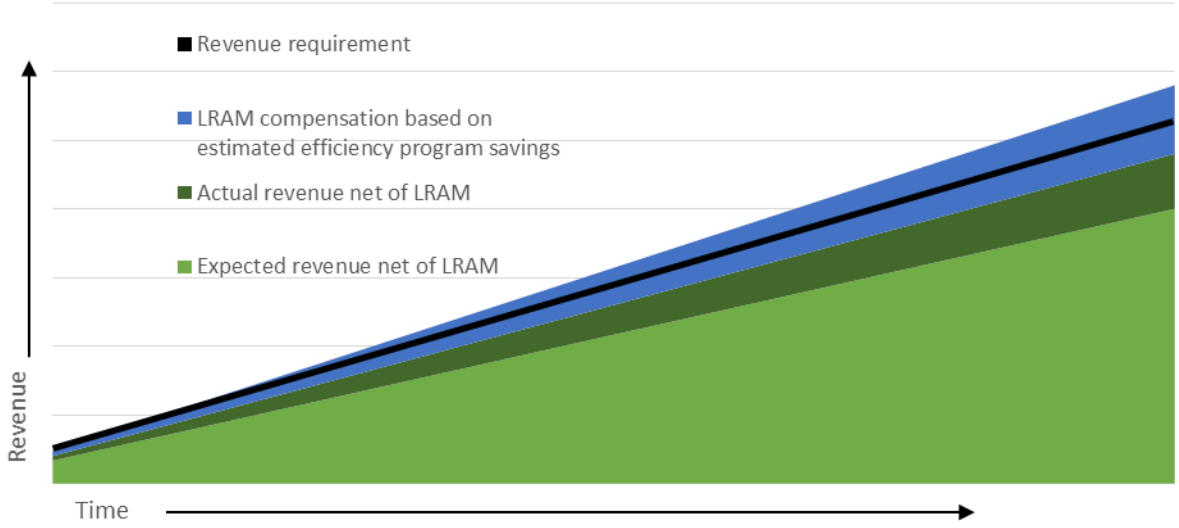

Figure 2. Potential problem with LRAM if sales are above forecast after energy efficiency programs are enacted. The dark green area is revenue above what was predicted in the test case. By evaluating savings generated through efficiency, utilities are often still able to recover the total amount of lost revenues shown in blue, even the portion above the revenue requirement.

Unlike decoupling, then, LRAM does not completely remove the link between a utility's sales and its revenues. As can be seen in figure 2, a utility could have the incentive to boost sales above the level originally forecast to allow recovery of authorized revenues beyond the revenue requirement. Some states have tried to design LRAM policies to address this issue. For example, in Nevada, utilities are explicitly prevented from over-earning and in recent years have refunded excess revenues to customers.

One more initial point should be made about LRAM. This mechanism does not reimburse utilities for the cost of energy efficiency programs; rather, it makes them whole for revenues they have lost as a result of selling less energy. Analysts should not regard LRAM as a cost of energy efficiency, and they should not include it in cost calculations, for example when they compare the cost of energy efficiency with that of other resources. This mischaracterization becomes especially misleading when LRAM dollars compound over time if there are long intervals between rate cases. We discuss this issue in the section below on the "pancake effect."

LRAM IN THE STATES

In recent years, many states have adopted the LRAM approach to address utilities' throughput incentive. In 2011, an ACEEE paper detailed the experiences of several states with LRAM in place (Hayes et al. 2011). The authors found 13 states with current or pending LRAMs for at least one electric or natural gas utility, but only 4 states with more than a year of experience. Since that time, more states have adopted this type of regulatory mechanism,

and many have had several years of experience. Currently, 17 states have LRAMs in place for at least one major electric or gas utility (figure 3).[4]

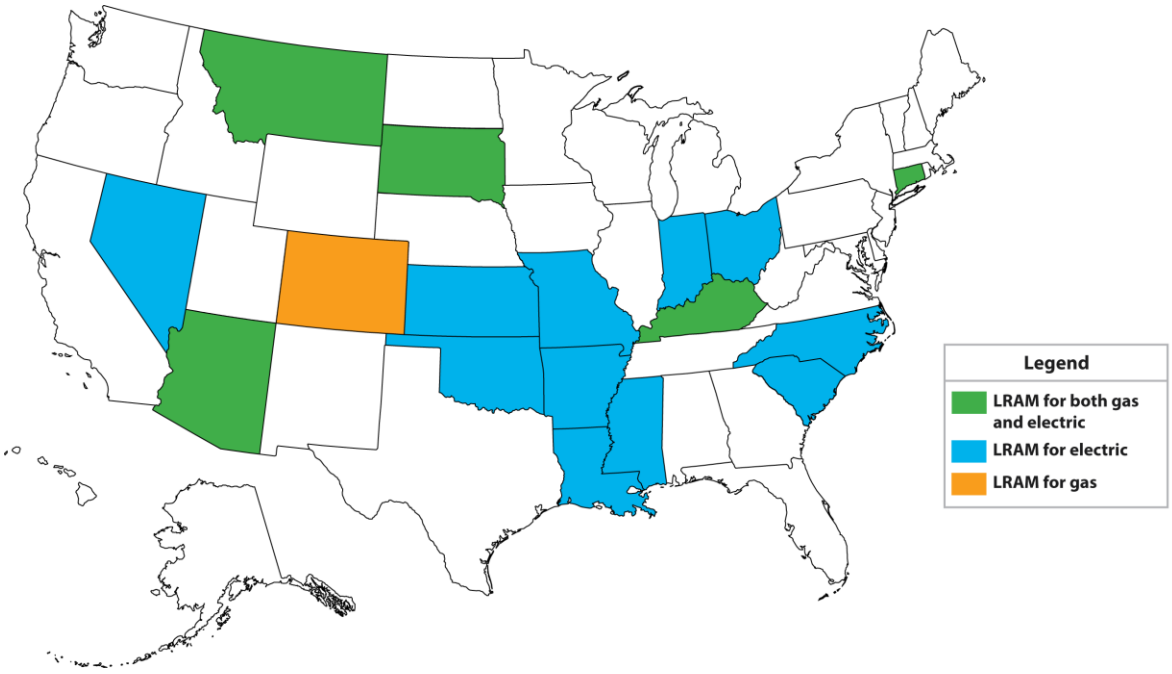

Figure 3. States with at least one utility with an LRAM currently in place. Note that decoupling or other rate adjustment mechanisms may also be in place for some utilities in these states. In Connecticut, CL&P, the only electric utility in the state with an LRAM, included a decoupling mechanism in its most recent rate case.

ACEEE tracks LRAM and decoupling policies through its *State Energy Efficiency Scorecard*.[5] Information on utility business models is also maintained in the ACEEE State and Local Policy Database.[6] However we have not examined these policies in detail since 2011 (see Hayes et al. 2011). This report expands on our prior research, describing state experiences to date and detailing the outcomes. We describe the current landscape of lost revenue adjustment across states, summarize the available data, discuss our results, and offer recommendations.

Methodology

To begin research for this report, the authors sent a questionnaire to public utility commissions in each state with an LRAM in place (see Appendix C). We asked commission staff to submit both qualitative and quantitative data on mechanisms in place for electric utilities, gas utilities, or both. In total, we distributed 24 questionnaires. Through the data collection process, we learned that six states had policies that did not fit our definition of a lost revenue adjustment mechanism. We did not include these states in this report. Four

[4] LRAM is currently pending in Louisiana but has not yet been implemented.

[5] Most recently, see Gilleo et al. 2014.

[6] http://database.aceee.org/

states did not complete the questionnaire. Many other states returned the questionnaire but indicated that at least some relevant data were unavailable or unclear.

Using the questionnaires as a starting point, we conducted interviews with states selected to represent a variety of geographical locations and regulatory experiences. Interviews with public utility commission staff, consumer advocates, utility representatives, and efficiency advocates added context to the technical details of the LRAMs in place in each of these states. We also parsed additional information from utility dockets when necessary. Using case studies and the quantitative data available, we developed a set of observations regarding state experiences with LRAMs.

Through this process we found that LRAM is being implemented in a variety of ways across the states. Because of the differences in regulatory structures and true-up timelines and the nuances in spending and savings data submitted, we cannot make apples-to-apples comparisons of dollars awarded under LRAMs. However we do present quantitative data where they are available to illustrate both trends and variation.

Each state profiled in this report treats lost revenue differently. While quantitative data are useful for understanding patterns and variances, it is also important to understand the subtleties of both policy design and policy priorities in each state. In the sections below, we describe state experience with LRAM, discuss our findings, and offer recommendations.

LRAM: History and Current Practice

HISTORICAL PERSPECTIVE

Lost revenue adjustment mechanisms are not new. In the 1980s and early 1990s, several states enacted policies allowing utilities to recover revenues lost from energy efficiency programs. However state experience with LRAM during this period was fraught with long and contentious proceedings. LRAM led to price increases, and lost revenue dollars recovered approached the amount of total dollars invested in energy efficiency (Hayes et al. 2011). These issues led many states to abandon the policy.

Historic Example: Minnesota

A prominent example of issues associated with lost margin recovery can be found in Minnesota, where an LRAM policy adopted for the state's electric utilities in 1991 was creating rapidly escalating LRAM costs for ratepayers. Due to the accumulating lost revenues between rate cases (see the discussion of pancaking that begins on page 11 of this report), the cost for lost revenues to ratepayers in 1997 was equivalent to 60% of the energy efficiency program costs, and climbing. In a filing to the Minnesota Public Utilities Commission (MPUC), the Minnesota Department of Public Service (MDPS) cited the following concerns in Docket No. E002:

- The period between rate cases is much longer than that envisioned when [the lost margin policies] were approved, significantly increasing the level of lost margins accrued.
- Lost margins increase rates without any tangible benefit to ratepayers.
- True lost margins are shrinking because, in the long run, "fixed" costs become variable costs.
- Utilities have growing opportunities to sell their saved energy on the wholesale market.

The MDPS noted:

> [I]t has now been 12 years since Otter Tail Power filed a rate case, 5 years since NSP-Electric filed, 4 years since Minnesota Power filed, and 3 years since Interstate filed. The frequency of rate cases is an important issue. The longer time lag has increased lost margins significantly, thereby raising the costs of electric utilities' DSM investments to ratepayers.

The MDPS added, "Clearly, [lost margin recovery was] intended to compensate utilities for short-term revenue losses between relatively frequent general rate proceedings. They were not intended to provide long-term windfall gains to shareholders."

For the state's largest utility (Northern States Power), while the energy efficiency program budget actually declined somewhat from 1994 through 1997, the annual lost revenue recovery increased eightfold over that time period. The MDPS recommended ending the LRAM policy after that case, and the MPUC subsequently agreed (Docket No. E002/M-98-443).

Despite the outcomes in the 1980s and 1990s, in recent years a number of states have again begun to adopt LRAM as a tool to encourage energy efficiency. The policy is meant to address utilities' concerns about revenues lost (contributions to fixed costs) as a result of customer energy efficiency programs. ACEEE's previous review of LRAM (Hayes et al. 2011) found that although the use of LRAM was increasing, there were limited data available to assess both the types of approach and the outcomes. The report also noted that no standard approach to implementation of an LRAM had emerged. Several years later, we see that the variation in these policy mechanisms is just as great. In Appendix A, we outline the details of lost revenue adjustment mechanisms currently in place in the United States.

Our research also brought to light several states where it was unclear whether a policy could be categorized as an LRAM. For example, Georgia allows utilities to earn an "additional sum," and its state code directs the utilities commission to "consider lost revenues…between the utility and its retail customers." While there had been some question as to whether Georgia's additional sum included the recovery of lost revenues, state contacts preferred to describe their regulatory mechanism as something closer to a

performance incentive.[7] Alabama's Rate Stabilization and Equalization (RSE) Mechanism also is similar to an LRAM, although its purpose is to smooth customers' rates rather than remove the throughput incentive. We did not include Alabama's RSE or Georgia's additional sum calculation in this study. Wisconsin had a pilot program similar to Alabama's RSE from 2009 to 2013 and is likewise not included in this study. The mechanism captured over- and under-collections of Wisconsin Public Service Company's gross margin due to any cause, based on the number of bill counts. We also did not include Wyoming in our analysis of LRAMs. Wyoming does have a mechanism in place that allows Montana Dakota Utilities to recover lost revenues, but this mechanism applies only to load management programs. Since the LRAM does not apply to energy conservation efforts, we omitted it from our analysis.

Other states have had LRAMs in place in the past but have since eliminated these policies, opting instead to allow utilities to meet revenue requirements through decoupling or other rate design methods.[8] We did not include such states in our research for this report, focusing instead on policies currently being implemented.

BY THE NUMBERS

We asked states to submit information on lost revenue dollars eligible for recovery by utilities in the two most recent program years, along with information on program costs and annual savings from energy efficiency programs for each of those years. Not all states were able to provide this information. In total, we received data covering 32 utilities in 17 states, most outlining program expenditures, annual savings, and eligible LRAM dollars in years 2012 and 2013, with a few results from 2011 and 2012. Figure 4 shows eligible dollars for recovery from lost revenue associated with electricity efficiency programs.[9] LRAM dollars are normalized over electricity savings.

[7] See Nowak et al. (2015) for more information on Georgia's and other states' performance incentives.

[8] For example, Hawaii terminated its LRAM mechanism in 2010 in favor of decoupling. Minnesota recently approved a decoupling mechanism.

[9] Note that in certain states, utilities may not *actually* recover all eligible dollars. For example, in Nevada, utilities are instructed to return lost revenue dollars to ratepayers after exceeding revenue requirements.

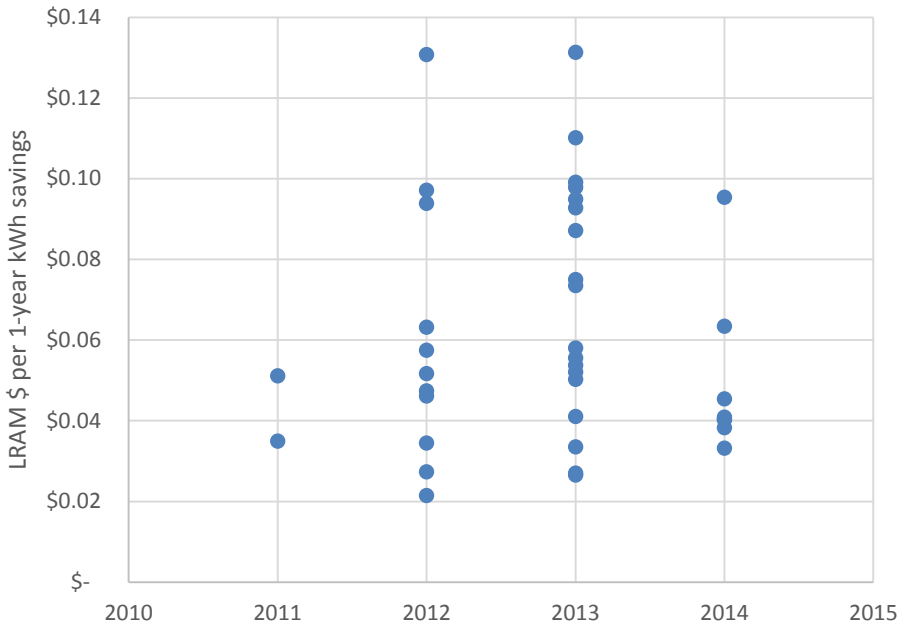

Figure 4. Lost revenue adjustment dollars recovered per kWh savings for electricity efficiency programs. Savings are annual one-year program savings. Data supplied by state public utility commissions. Note that not all states were able to provide data.

The amount utilities were eligible to recover per unit of electricity saved ranged from $0.02 per kWh to $0.13 per kWh, with a median of $0.05 per kWh. This range speaks to several factors that may influence LRAM collection:

- Different rate structures put varying amounts of rates in fixed and variable charges. The more that bills vary with consumption, the higher the LRAM rate will be.
- A utility's fixed charges also play a large role. Some utilities are vertically integrated, so LRAMs capture generation fixed costs. Other states have distribution-only utilities, so customers are not assessed generation-related fixed costs in LRAMs.
- States also have different limits in place for the time over which a utility may collect LRAM dollars for a given program year. In some cases, regulators were not able to say definitively that LRAM dollars were associated with a particular year's programs. In such situations, it is possible that recovery is also associated with additional savings from previous programs, making recovery amounts seem artificially high in comparison with energy savings.

Figure 5 shows eligible dollars for recovery of lost revenues associated with natural gas efficiency programs. LRAM dollars are normalized over natural gas savings.

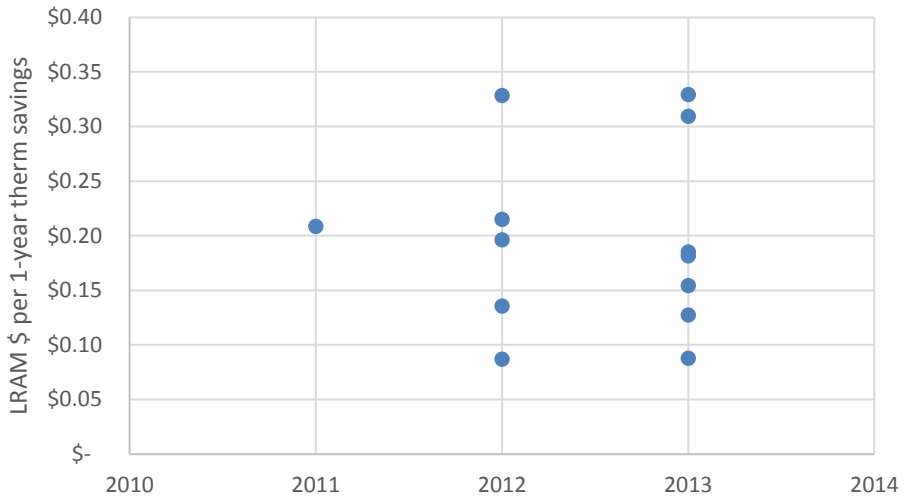

Figure 5. Lost revenue adjustment dollars recovered per therm savings for natural gas efficiency programs. Savings are annual one-year program savings. Data supplied by state public utility commissions.

As with LRAM dollars associated with electricity efficiency programs, we see notable variation in LRAM dollars eligible for recovery per unit of natural gas savings. Eligible recovery amounts range from $0.09 per therm up to $0.33 per therm, with a median of $0.19 per therm. Here too, differences in base rates may play a role. The inability to separate total lost revenues to show the amount associated with individual recovery years may also inflate figures.

The range in LRAM dollars per energy unit is dependent on the fixed costs for a given utility, which vary significantly based on a number of different factors. At their most basic, lost revenues are typically calculated as follows:

Lost revenues = Retail rate – Short-term avoided costs

Thus, lost contributions to fixed costs are directly dependent on the factors that make up utilities' base rates, and both fixed and variable costs can have an effect on the lost margin. Fixed costs can include investment costs; unavoidable costs of maintaining power plants, transmission lines, and other infrastructure; and other non-avoidable operating costs like personnel (NARUC 2007). These fixed costs may vary for a number of reasons. Simple avoided costs, as shown in the calculation above, typically represent fuel cost, although they are rarely so straightforward in practice. RAP (2011) calls these costs production costs and notes that in addition to fuel, they can include purchased power expenses, operation and maintenance costs, and transmission expenses. These too can vary by utility and region.

A variety of factors can influence lost revenue calculations, both in terms of a utility's overall fixed and marginal costs and in terms of the choices regulators make in designing the lost revenue calculation. Many states include separate LRAM calculations for each rate class. Some states factor in peak demand reductions in addition to changes in overall energy consumption.

Perhaps more telling is the comparison of a utility's program costs to the amount of lost revenue it claims each year. Figure 6 shows how the LRAM dollars recovered annually by electric utilities compare to annual program costs.

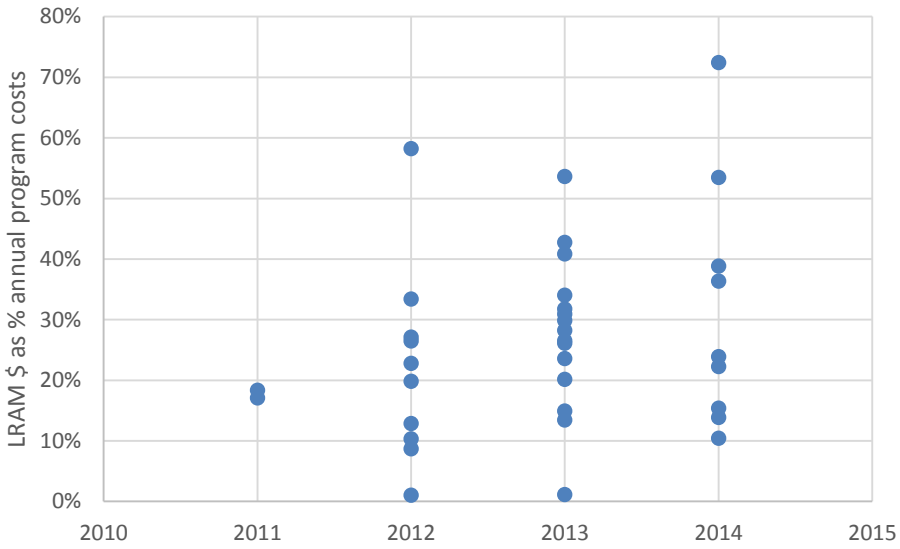

Figure 6. Lost revenue dollars eligible for recovery as a percentage of electricity efficiency program expenditures

Among the electric utilities we surveyed, LRAM dollars as a percentage of program costs varied widely. At the low end, dollars collected for lost revenue were equivalent to only about 1% of electricity efficiency program costs in a given year.[10] Median recovery was 25% of annual program costs. However, for one utility surveyed, lost revenues recovered were equivalent to more than 70% of program costs. It is likely that in such cases, several years of recovery were rolled into a single rate case. Thus, the LRAM dollars reported were not completely tied to a single year of efficiency programs, but rather accrued due to savings achieved over multiple years.

THE PANCAKE EFFECT

As noted above, LRAM dollars are not additional costs of efficiency programs. Rather, they reflect the collection of already authorized utility system fixed costs, and their collection is meant to bring the utility back in line with its revenue requirement. However there is the potential for over-earning under an LRAM if the mechanism is not well designed and closely monitored and if rates are not regularly reset to reflect updated electricity sales forecasts and utility system costs.

Efficiency measures generate savings over time. Absent intervention, and with everything else equal, lower consumption will cause a utility to not collect its fixed costs of providing service until the next rate case. In a rate case, rates are set based on current or projected

[10] This result was a for a very small efficiency program. The lowest dollar amount collected for a larger program was about 9% of program costs.

future consumption, taking into account already existing energy efficiency. LRAMs make a utility whole in the periods between rate cases. But if rate cases are few and far between, balances in a LRAM account can build up, because each year the utility is capturing the revenue lost not only from measures implemented in that year, but also from energy efficiency measures put in place since the last time rates were set. This so-called pancake effect would impose substantial additional costs on customers if many years pass between program implementation and the next rate case. This hypothetical scenario is illustrated in figure 7.

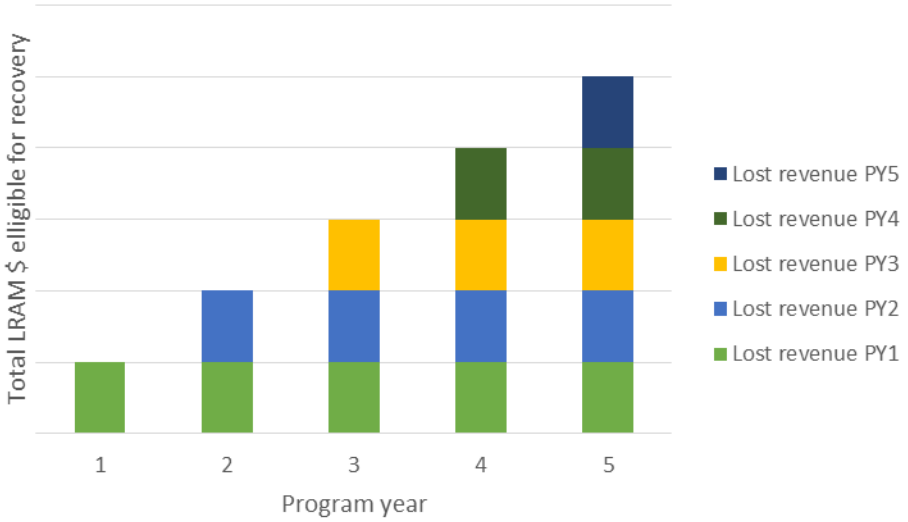

Figure 7. Scenario in which lost revenues pancake over a five-year period between rate cases. Lost revenues typically reset between rate cases, and rates are recalculated on the basis of a more current test year. For these reasons, timely rate cases help minimize pancaking and over-earnings.

As suggested above, regular rate cases can help minimize the pancaking effect, since regulators and utilities will take the effects of past years' energy efficiency programs into account in their predictions of future sales. States often set requirements stipulating the frequency with which utilities must come in for rate cases and reset lost revenues. Figure 8 shows the length of time, according to our research, that utilities typically collect lost revenues associated with a particular program year.

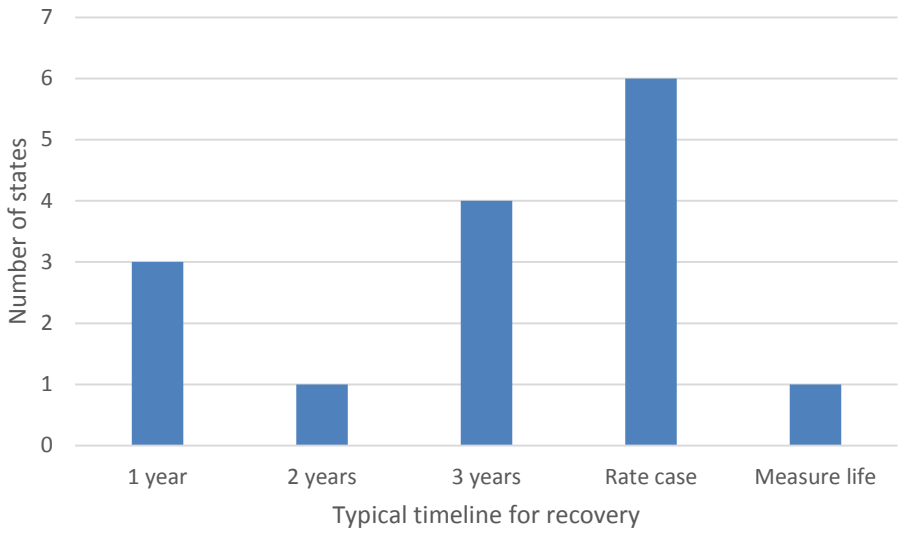

Figure 8. Length of time over which lost revenue are typically recovered for a single program year. Data from state responses.

It is most common for states to limit recovery to one to three years, although many states allow utilities to recover lost revenue for an indefinite period of time, resetting lost revenues during base rate cases. Respondents indicated that in these cases, although rules might not be in place specifying the allowable length of time between rate cases, utilities tend to bring them forward every two to three years. If there is no time limit on recovery of LRAM dollars (or rates are not reset to halt the LRAM collection), those dollar costs can pancake year after year. This has happened in some states, leading to a rejection of the LRAM policy.[11] Only one state indicated that utilities are able to recover lost revenue over the full life of an efficiency measure, regardless of rate cases.

It is also important to note that the pancake effect is an added challenge for regulators. Few regulatory staff were able to parse out lost revenues associated with a particular year's efficiency programs. Since LRAM dollars tend to flow into a single efficiency rider from several years' worth of programs, it can be difficult for regulators to judge the reasonableness of a utility's request for lost revenue. Development of reliable tracking systems is costly in terms of both time and money, and public service commissions are often understaffed and underfunded. Due to these constraints, quantifying the dollars associated with specific program years is often a near-impossible feat.

DOES LRAM FACILITATE GREATER ENERGY EFFICIENCY?

The fundamental purpose of an LRAM policy is to facilitate greater investment in energy efficiency by a utility. The LRAM is meant to address utility concern about lost contributions to fixed costs due to energy efficiency programs. Data on energy efficiency program performance available from ACEEE's annual *State Energy Efficiency Scorecard* allow

[11] See the Minnesota example above.

us to examine whether electric utility LRAMs are associated with greater energy efficiency accomplishments.

For this analysis we focused on two key indicator variables (energy efficiency spending as a percentage of total revenues, and energy efficiency kWh savings as a percentage of retail sales), using the most recent year (2013) for which complete data were available. Many unique factors in a state or utility will influence utility behavior regarding energy efficiency programs, but it is nonetheless useful to look at how patterns of performance vary across many states under different policy conditions.

Due to a small sample size, we were limited in our analysis and relied on data visualization to make inferences. To begin, we compared states that had an LRAM policy in place for at least one utility in 2013 with states that had no LRAM or decoupling policy in place. (States with decoupling were excluded for the first analysis because decoupling is intended to address the same issue as LRAM.) No clear pattern emerges when comparing efficiency budgets between these two groups of states. While the spread between maximum and minimum budgets is larger for states with no revenue adjustment mechanism, median budgets are about the same (0.85% and 0.95%). Figure 9 shows efficiency budgets for these groups of states.

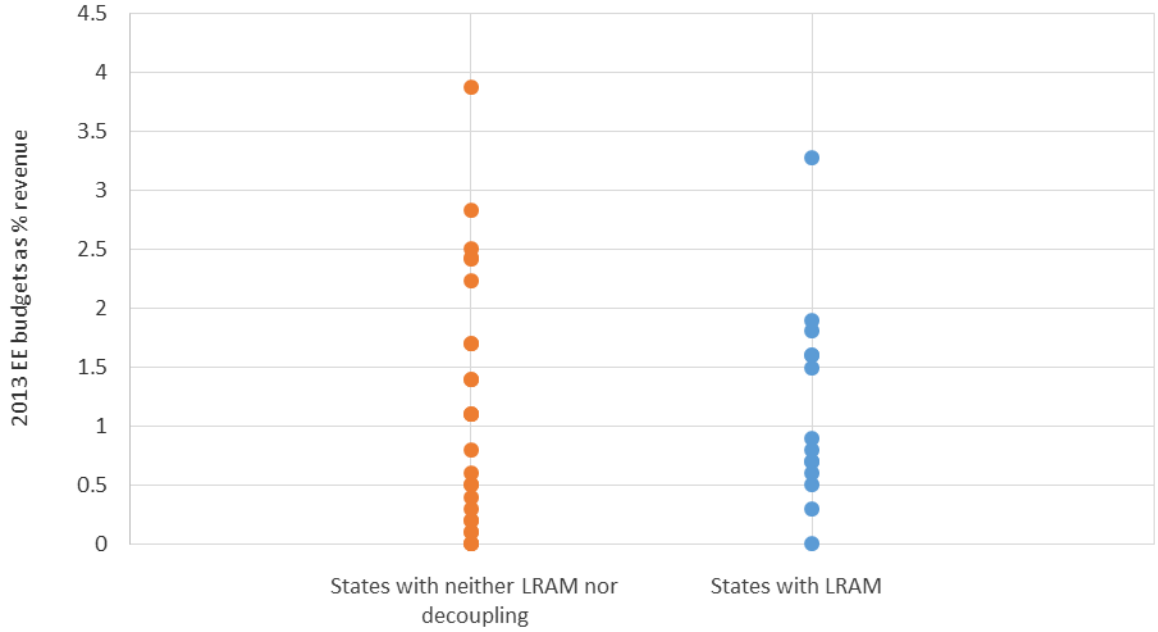

Figure 9. Efficiency budgets in states with LRAM compared with states having no revenue adjustment mechanism

Figure 10 shows 2013 savings data for this same set of states. Median statewide electricity savings for states with LRAM was 0.55% in 2013, compared with median savings of 0.3% in states with no revenue adjustment mechanism.

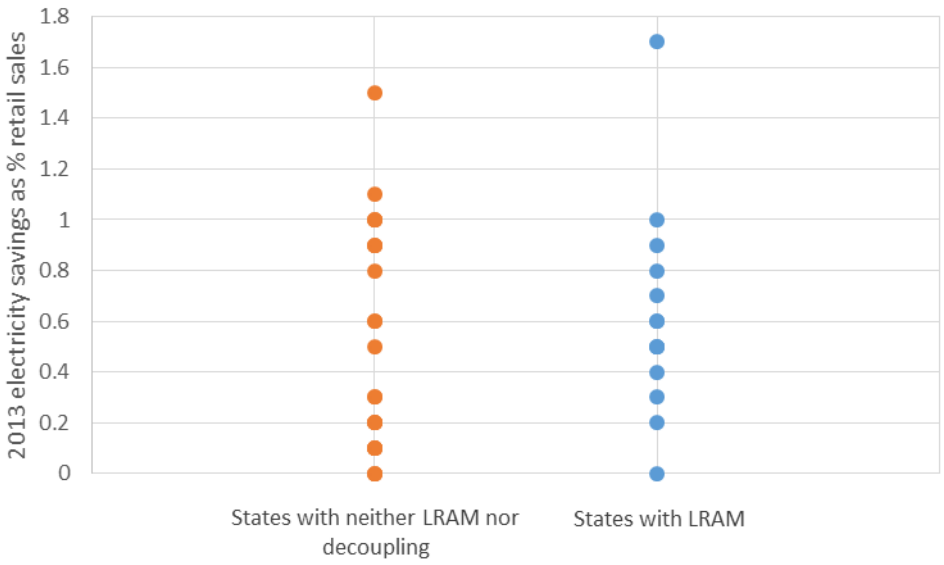

Figure 10. Electricity savings in states with LRAM compared with states having no revenue adjustment mechanism

We then compared states with LRAM against states with at least one electric utility decoupled. Figure 11 shows 2013 electricity efficiency budgets for these states.[12]

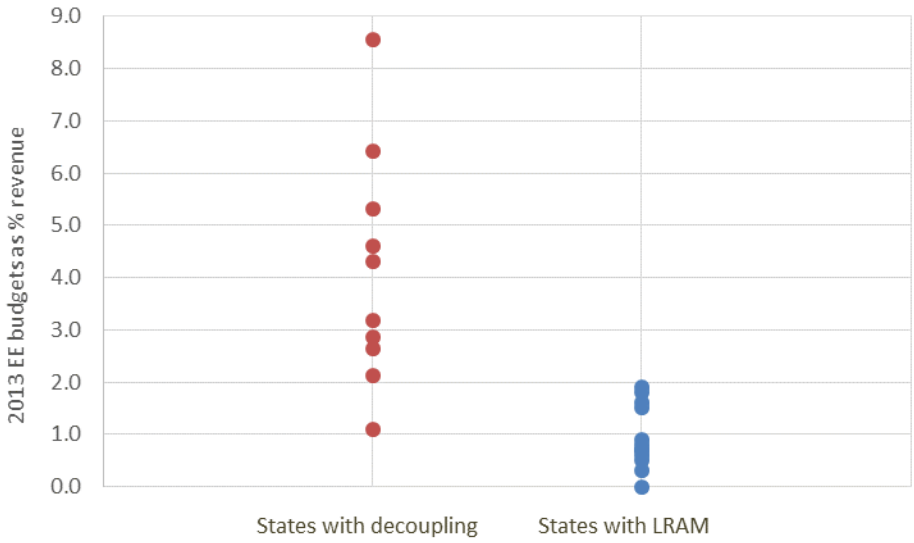

Figure 11. Electricity efficiency budgets in states with LRAM compared with states that have decoupling

Here, we do see some difference between spending in states with decoupling and those with LRAM. Specifically, states with decoupling appear to be spending more on energy efficiency

[12] States in which at least one utility is decoupled *and* one utility has an LRAM in place were excluded from this analysis.

relative to revenue. We see a similar pattern in our comparison of electricity savings, shown in figure 12.

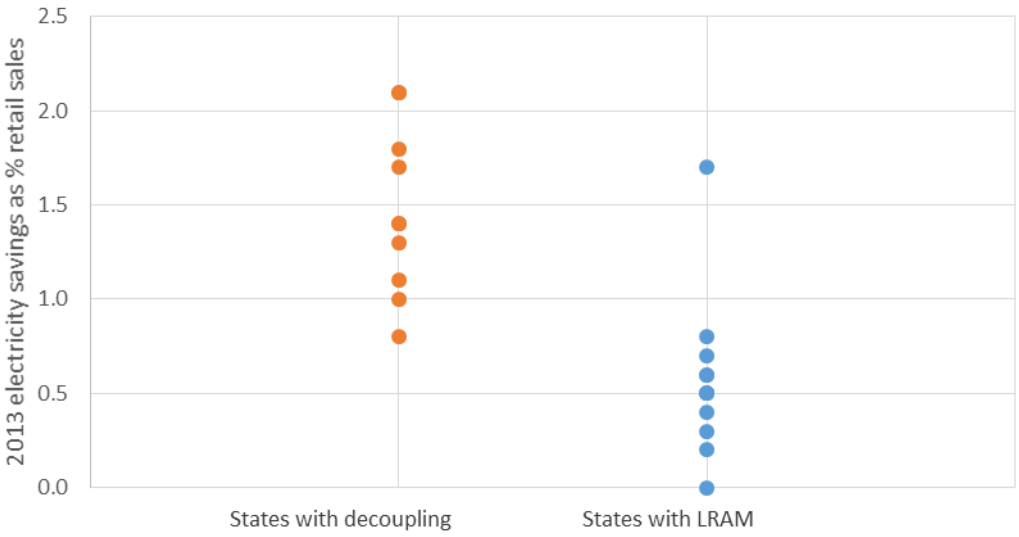

Figure 12. Electricity savings in states with LRAM compared with states that have decoupling

Median incremental electricity savings in 2013 was 1.4% for states with decoupling, compared with median savings of 0.5% for states with LRAM, a stark difference. However, it is important to note that all but one of the decoupling states also had an energy efficiency resource standard (EERS) policy in place, which we have found to be the dominant policy associated with greater energy efficiency spending and savings. To control for that factor, we did two additional analyses. First, we looked just at states with an EERS, charting efficiency budgets for states with LRAM and for those with decoupling. Figure 13 shows the results of this analysis, which included only a small set of states.

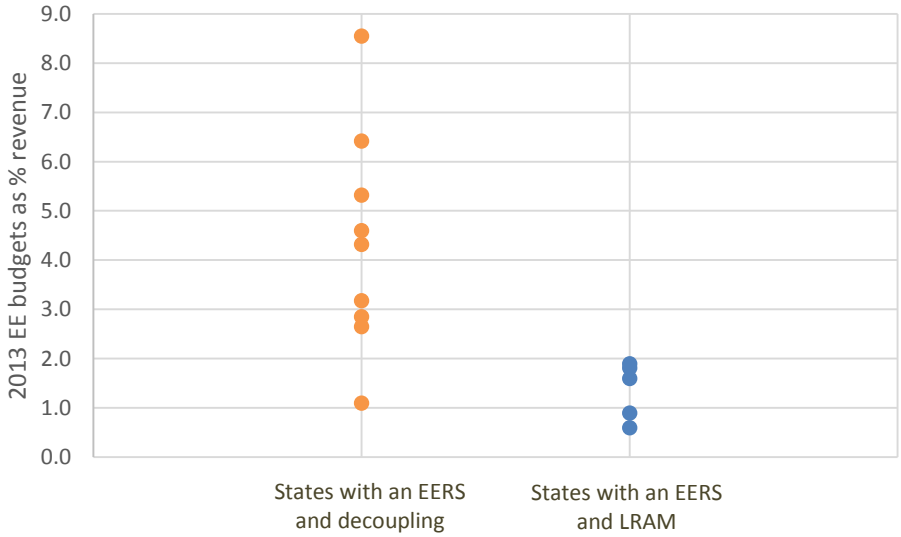

Figure 13. States with LRAM compared with states with decoupling when an EERS policy is in place

Figure 14 shows the results of this analysis for statewide electricity savings in 2013.

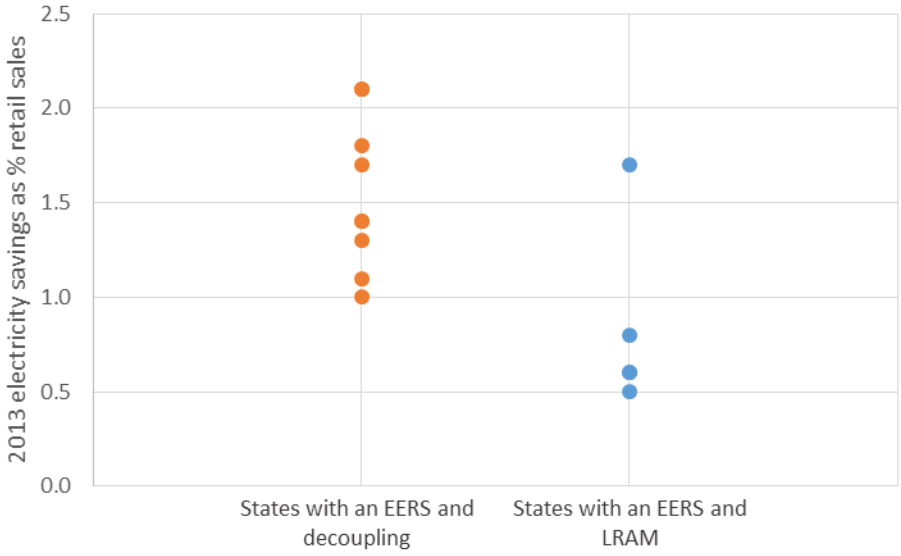

Figure 14. States with LRAM compared with states with decoupling when an EERS policy is in place

Here also, data visualization indicates that when an EERS is in place, states with decoupling tend to have higher electricity efficiency budgets and savings than states with LRAM. However the directionality of cause and effect may be an issue, and other factors could also play a large role, such as specific EERS targets in these states. Year of EERS adoption may also account for some of the variation between groups. Idaho is the only state without an EERS in place to have at least one decoupled electric utility in 2013, so it was not possible to compare budgets for states with decoupling and states with LRAM when no EERS is in place.

These findings are obviously not determinative for every state or utility. Still, the results suggest that, in aggregate, having an LRAM policy is not currently associated with higher levels of energy efficiency effort (program spending) or achievement (energy savings) than can be found in states without an LRAM policy.

Discussion

In its second incarnation, LRAM appears to face many of the same issues that it did in the early 1990s. In its *National Action Plan for Energy Efficiency* (EPA 2007), the US Environmental Protection Agency (EPA) laid out the following pros and cons of lost revenue adjustment mechanisms:

Pros:

1. Removes disincentive to energy efficiency investment in approved programs caused by under-recovery of allowed revenues.
2. May be more acceptable to parties uncomfortable with decoupling.

Cons:

1. Does not remove the throughput incentive to increase sales.
2. Does not remove the disincentive to support other energy saving policies.
3. Can be complex to implement given the need for precise evaluation, and will increase regulatory costs if it is closely monitored.
4. Proper recovery (no over- or under-recovery) depends on precise evaluation of program savings.

The case studies presented in Appendix A further illustrate each of these points. While many states have reported benefits from LRAM policies, many of these same states have also noted the flaws. Moreover, it is not clear that states have been able to strike the necessary balance between accuracy in valuing lost revenues and efficiency in administering the policy. Below, we identify a number of factors that states should weigh in considering adjustments to current policies or deciding whether an LRAM is an appropriate regulatory tool to pursue in the future.

AN LRAM CAN BRING PARTIES TO THE TABLE

Energy efficiency *does* reduce utility sales, and utilities *should* be able to recover their authorized fixed costs. Decoupling is the simplest way to ensure that a utility meets its revenue requirement even if other factors dampen sales. But in many states, key parties view decoupling unfavorably.[13] Utilities often push back against decoupling proposals because they feel they should be allowed some level of reward for the risks they often must bear.[14] Some consumer advocates have also worked to block decoupling proposals, citing added costs, reduced utility risk at the expense of additional risk placed on consumers, and a general opposition to automatic rate adjustment mechanisms.

In many states, LRAM has been used as an alternative to decoupling to make utilities whole after investments in energy efficiency. Utilities may be supportive of LRAM because there is the potential to accrue revenues beyond the regulator-determined revenue requirement, resulting in pure profit for the utility.[15] Since LRAM expressly requires the calculation of energy savings from efficiency programs and omits other variables like weather, consumer advocates may also feel better about allowing utilities to recoup these costs. While LRAM is a less desirable solution than decoupling, it can bring parties to the table in circumstances where decoupling may not be feasible.

GOOD EM&V IS IMPORTANT

Allowing utilities to recover the revenues lost due to implementation of efficiency programs necessitates the need for accurate evaluation of programs. In order to prevent overcharging

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[13] See RAP (2011) for a complete discussion of the arguments often made against decoupling.

[14] See Vilbert et al. (2014) for a discussion of the impact of decoupling on the cost of capital. The study finds that decoupling is not associated with a decreased cost of capital.

[15] Some states have limited lost revenue recovery to prevent over-earning. For example, see the Nevada case study in Appendix B.

customers or undervaluing a utility's lost revenues, utilities and regulators need to get the savings right. Evaluation of savings is controversial in many of the states in which we conducted interviews. Though evaluation procedures were already in place for efficiency programs in many states, when lost revenues were at stake the scrutiny became far greater.

Key parties were reticent about evaluation methods for a variety of reasons. Consumer advocates in some states were wary of "estimations" of savings, saying that it was impossible to judge whether savings were actually achieved. Commissions also noted that changing evaluation methodologies led to lengthy back-and-forth exchanges between utilities and regulatory staff. Ultimately, evaluation procedures do rely on some level of sampling, statistical analysis, and estimation. There may be additional difficulties in states with net savings requirements, as evaluation efforts need to not only focus on engineering estimates but also project what would happen in the absence of programs.[16] Since it is impossible to weigh the results of efficiency programs against a hypothetical (i.e., electricity consumption absent utility-run efficiency programs), it is important that all parties understand and agree to evaluation procedures. The evaluation process should be rigorous and transparent, with appropriate checks along the way.

In a few states we surveyed, there was little oversight of evaluation methods or results by the utility commission. While this led to efficient, uncontested rate case and demand-side management (DSM) proceedings, it also eliminated an important checkpoint for accuracy. We found very few examples of states that had reached a middle ground between accuracy and efficiency. Including stakeholders in discussions of evaluation procedures, setting clear evaluation and reporting guidelines for utilities, and including independent evaluators in the process may help states find this balancing point. Finally, evaluation techniques continue to improve and evolve as new technologies open the door for real-time analysis of certain program types. Embracing these technological innovations may simplify and streamline EM&V processes.

TIMING MATTERS

Timing is critical to precise, efficient implementation of an LRAM. Since energy efficiency program decisions and rate-making decisions are necessarily intertwined in states with an LRAM in place, having these two functions occur at the same time can help streamline processes. In many of the states we spoke to, all parties expressed the difficulty of dealing with lost revenues when rate cases were dealt with separately from DSM decisions. In some states, this increased the number of true-ups needed to recover a single program year's lost revenues. It also ate away at staff time. Several other states with multiyear experience implementing an LRAM had adjusted timelines for rate-making and DSM decisions so that the two proceedings occurred jointly.

While timing of rate cases and DSM proceedings is important from a logistical standpoint, perhaps more important from a financial standpoint is the time between rate cases. Since

[16] Net savings calculations factor in the impacts of free riders and spillover on efficiency programs. Therefore, not all savings calculated using engineering estimates may be attributed to a utility. Net savings are often about 90% of gross savings (Gilleo et. al 2014), but these ratios can vary greatly from state to state.

adjustments to lost revenue rely on a test year, the more up to date these test cases are, the more accurate the calculation of lost revenue can be. Frequent rate cases also avoid the issues associated with pancaked savings, as discussed above. When revenue adjustments are made infrequently, the result is a large sum of money passing from consumers to utilities. Whether or not this transfer is legitimate, the impression it creates can be a matter of contention among utilities, regulators, and consumer advocates. Policies that cap lost revenue to two or three years can avoid this problem.

AN LRAM ALONE WILL NOT FULLY INCENTIVIZE EFFICIENCY

Lost revenue adjustment is just one (optional) approach to aligning utility incentives with investment in energy efficiency. While the lost revenue adjustment can help make a utility whole by compensating it for reduced energy sales, it will do little to *encourage* investment in energy efficiency unless combined with other policy levers. Our analyses indicate that having an LRAM policy itself is not currently associated with higher levels of energy efficiency effort (program spending) or achievement (energy savings) than are found in states without an LRAM policy. Setting energy savings targets through an EERS and implementing performance incentives tied to specific energy saving levels are ways that regulators can encourage prioritization of energy efficiency.[17] Evaluating energy efficiency in the same manner as other supply-side resources during resource planning also should help to encourage energy efficiency utility investments.

Similarly, an LRAM does not eliminate a utility's throughput incentive. The LRAM compensates a utility for energy savings achieved by its programs, but if a utility can sell more energy while also delivering efficiency programs, it may be able to recover dollars beyond its revenue requirement. Thus, an LRAM can result in a utility's pursing energy savings with one hand while seeking additional sales growth with the other.

Additional Questions and Further Research

RATE IMPACTS OF LRAM

The rate impacts of decoupling are well known due to careful research and tracking over the past several years (most recently Morgan 2013). However a similar analysis has not yet been completed for LRAM. Such research would be complicated but would better show the impacts of a policy that could be effective at its best but overly generous at its worst. Data on the impacts of dollars recovered through lost revenue are murky. Public utility commission staff are often unable to untangle LRAM dollars to align dollar amounts with individual program years. However future research should endeavor to tease out these intricacies in order to better understand the rate impacts of LRAM policies. Then more straightforward comparisons with decoupling could be made—both in terms of overall savings achieved under the policy and in terms of the financial impacts on ratepayers.

[17] For an overview of EERS policies, see Downs and Cui (2014). For further discussion of performance incentives, see Nowak et al. (2015).

EFFECTS OF OFF-SYSTEM SALES

Over the course of this study, many utilities noted that efficiency programs left a hole in their revenues that LRAM was able to close. However utilities have other avenues for selling unused energy and may still earn profits from power that is not provided directly to their customer base. For example, most utilities can sell unused energy off system. These sales allow companies to make profits above the allowed revenue requirements and to make up lost revenues from several different factors. Some states allow shareholders to keep most of the earnings from off-system sales as profit, although many include requirements for crediting back some of the earnings to ratepayers (NARUC 2008). Off-system sales can be in the tens of millions of dollars and can be a huge part of a rate case (AEP 2014). If utilities are generating excess capacity and selling it off system, it may be that they are not truly losing revenues to efficiency but are simply earning those revenues outside of their customer base. In such cases, LRAM may be an additional earnings pathway, doing more than just making a utility whole. While this paper does not dive into the connection with off-system sales, future research should investigate how often these sales can effectively fill the hole that efficiency programs create in utility revenue, potentially negating the need for an LRAM.

Conclusion

Creating a regulatory environment that incentivizes utilities to invest in efficiency is critical for programs to be successful, impactful, and long lasting. Doing so requires a mix of policy tools. In addition to energy efficiency targets, utilities need a business model that aligns their financial interests with energy efficiency, including program cost recovery, performance incentives that encourage utilities to achieve high levels of savings, and some policy mechanism to neutralize the throughput incentive. It is our opinion that decoupling is the best "third leg" of this stool. However it is also clear that decoupling is not always an option for states for a variety of reasons. In such scenarios, LRAM can be a temporary solution, addressing concerns over lost revenues and, possibly, helping to make parties more comfortable with the idea of full decoupling in the future.

But LRAM as a permanent policy fix is fraught with flaws. The regulatory burden is great, and the potential to shortchange customers and overcompensate utilities is ever present. As states gain more experience with LRAMs, problems continue to arise. Several states are striving for a simpler and fairer way to implement an LRAM that all parties will sign on to. In practice, an ideal LRAM possessing all of those qualities has yet to present itself. Finally, as noted above, having an LRAM policy in place does not currently appear to be associated with states' achieving higher levels of energy efficiency program spending or energy savings.

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Appendix A. Summaries of Currently Implemented LRAMs

State	Applicable utilities	Year authorized	Description of mechanism	Relevant rules and statutes
Arkansas	All electric and gas investor-owned utilities	2010	Arkansas rules allow recovery of lost contributions to fixed costs. These have been generally calculated as net savings times base rates, with savings being adjusted to take into account the timing (within the year) of measure installation and seasonality of the equipment.	Docket 08-137-U Order No. 14
Arizona	Arizona Public Service Company, UNS Gas, Tucson Electric Power Company, and UNS Electric	2012–2013	A lost fixed cost rate is determined at the conclusion of a rate case by taking the sum of allowed distribution and transmission revenue for each rate class and dividing each by their respective class adjusted test year kWh or therm billing determinants. The lost fixed cost rate is multiplied by the recoverable kWh or therm savings, by rate class.	Decision Nos. 73183, 73142, 73912
Colorado	Investor-owned natural gas utilities	2008	Each utility is to calculate a dollar per therm value that represents the utility's annualized fixed costs that are recovered through commodity sales on a per therm basis with the supporting methodology and documentation for the calculation. The dollar per therm value, as approved by the Commission, is multiplied by the annualized number of therms saved as the result of the DSM program, as reported in the utility's annual report. The approved amount is recovered through the Demand Side Management Cost Adjustment (DSMCA) and applies to first-year savings only.	Code of Colorado Regulations (CCR) 723-4 Part 4
Connecticut	Connecticut Natural Gas, Southern Connecticut Gas, Yankee Gas, Connecticut Light & Power[18]	1995 for natural gas utilities, 2013 for CL&P	Lost sales from conservation program expenditures are tracked by program and rate class, matched with expenditures, and carried forward monthly for the balance of the Conservation Adjustment Mechanism (CAM) period. Lost revenues are estimated by taking cumulative savings (savings carried forward year to year between rate cases) and are applied a lost margin rate. The lost revenues are recovered through the CAM ($.046 Ccf). The energy savings are multiplied by a margin amount per unit, accumulated over the period, and results in the lost margin component of the CAM.	PA-13-298 Docket No. 93-02-04 Docket No. 93-03-09 Docket No. 11-10-03 Docket No. 14-03-01

[18] The most recent CL&P rate case (December 2014, Docket 14-05-06) included a decoupling mechanism per Connecticut Public Act 13-298.

State	Applicable utilities	Year authorized	Description of mechanism	Relevant rules and statutes
Indiana	Indiana Michigan Power, Northern Indiana Public Service Company, Vectren Indiana, and Duke Energy Indiana. Request for lost revenue recovery by Indiana Power & Light is currently before the commission.	1995	Each utility must propose a process for calculating an LRAM. The calculation must account for the impact of free riders and the change in the number of program participants between base rate changes and the revised estimate of a program-specific load impact that results from the utility's evaluation activities. Efficiency savings are measured by an independent evaluator. Revenue is recovered either annually of semiannually. Lost revenues are recovered for the life of the measure or until the company's next base rate case.	170 IAC 4-8-6
Kansas	Westar Energy	2011	The Kansas Corporation Commission will consider proposals from electric and gas utilities that include shared savings performance incentives on a case-by-case basis. KCC approved lost margin recovery for Westar Energy's Simple Savings program.	Docket 08-GIMX-441-GIV Docket 10-WSEE-775-TAR
Kentucky	All regulated electric and natural gas utilities	1995	Energy savings are calculated based on engineering estimates for either participants, projects, or programs and multiplied by the number of participants, projects, or programs. This is multiplied by the lost revenue factor (energy charges less fuel and other variable costs). There is typically a three-year sunset provision for lost revenues.	Kentucky Statute 78.285 Case No 2014-00271 Case No 2014-00003
Louisiana	Cleco Power, Entergy Gulf States, Entergy Louisiana, and Southwestern Electric Power Company (SWEPCO)	2014	The lost contribution to fixed cost (LCFC) level for each customer class is initially determined by multiplying the "Class LCFC Factor" by the projected annual level of energy savings to be achieved through each Quick Start program. Generally, the "Class LCFC Factor" is calculated by dividing 12 months of customer class energy charge-related revenue, including formula rate plan increases or decreases, by the class kWh sales from the same period. There is no ceiling for LCFC recovery, but there is an overall cap on Energy Efficiency Riders of $75 monthly as set forth by the EE rules.	Docket No. R-31106
Missouri	Ameren, GMO, KCPL	2013–2014	Utilities earn a percentage of net benefits calculated using deemed gross savings. Measure level annual energy and demand savings, measure lives, rates for avoided energy saving, and rates for avoided demand savings are deemed. Staff of the Missouri Public Service Commission performs a prudence review no less often than every 24 months to verify the calculation of net benefits used for the throughput disincentive mechanism. Lost revenues are recovered continuously through a rider.	SB 376 Case No. EO 2012-0142 Case No. EO 2012-0166 Case No. EO-2012-0009 Case No. E)-2012-0175

State	Applicable utilities	Year authorized	Description of mechanism	Relevant rules and statutes
Mississippi	Atmos Energy Corporation and Centerpoint Energy. Mississippi Power Company's cost recovery rider has not yet been approved.	2014	The company uses estimates for the coming year of savings due to energy efficiency programs normalized for weather and multiplies that number by the base rates less any customer charge. Lost revenues are recovered annually with a true-up to adjust for any under- or over-recovery.	Docket No. 2010-AD-2 Order Adopting Rule 29
Montana	NorthWestern Energy	2005	Lost revenues are recovered annually, with true-ups following the tracking period once actual numbers are available and again following a comprehensive report. Lost revenues are calculated by multiplying energy savings by an adjustment factor by rates. The adjustment factor takes into account free ridership and spillover rates.	Docket No. D2014.6.53 Docket No. D2012.5.49
North Carolina	Duke Energy Carolinas, Duke Energy Progress, Inc., and Dominion North Carolina Power	2007, with implementation orders in 2010–2013	The basic calculation of net lost revenues (NLR) is performed by multiplying net kWh (and, in some cases, kW) savings from each approved DSM/EE program by the billing rates that would have been applied to those kWh, if actually sold, and then reducing those lost revenues by the fuel cost recovery included in the billing rate, as well as nonfuel variable operations and maintenance expenses. In general, recovery of NLR for each installed measure is limited to a maximum of 36 months, subject to certain other limitations. NLR are also reduced by any net found revenues (or revenues associated with other activities that cause an increase in demand).	NCGS 62-133.9 Docket No. E-100 Sub 113
Nevada	Nevada Power Company and Sierra Pacific Power Company	2011, with updates in 2013–2014	The total lost revenue amount is estimated by first allocating estimated savings to each class that incurred the savings. The amount of savings is then multiplied by the general rate associated for that class to calculate implementation revenue. The implementation revenue for all the classes is summed along with the estimated lost demand revenue for a total lost revenue implementation revenue requirement. Lost revenues are estimated and a rate is put in place annually, but true-ups can occur for a single implementation year over several years. Lost revenue collection is suspended when a company is over-earning.	NRS 704.785(1)(a)(2) NAC 704.95225(1)(b) Dockets 10-10024 and 10-10025

State	Applicable utilities	Year authorized	Description of mechanism	Relevant rules and statutes
Ohio	Dayton Power & Light	2007	Lost revenue recovery mechanisms are determined on a case-by-case basis. Lost revenues are recovered through a rider and are calculated as the amount of kWh savings times the energy charge for each rate class. Variable costs are removed, and the amount is divided by expected sales for a future year. Lost revenues may be collected for three years. Decoupling is in place for Duke Ohio and AEP.	Docket 08-920-EL-SSO Docket 11-3549-EL-SSO Docket 11-0351-EL-AIR
Oklahoma	Public Service Oklahoma and Oklahoma Gas & Electric	2008	Lost revenues are calculated annually and are continued until the next base rate case or adjustment to rates, during which time the lost revenues are zeroed out and the appropriate volume reduction (adjustment) is included in that filing. Lost revenues are calculated by multiplying energy savings by an embedded cost factor. The embedded cost factor is calculated by taking the embedded costs approved in the most recent rate case (less fixed customer charges) divided by the kWh used in the cost study.	PUD Cause No. 200700449, Order No. 555302
South Carolina	Duke Energy Progress, Duke Energy Carolinas, and South Carolina Electric and Gas	2008, reestablished in 2013	Lost revenues are estimated annually and trued up once EM&V is available. Lost revenue can be collected for three years after installation or for the life of the measure, whichever is shorter. Lost revenues are calculated by multiplying energy savings by avoided costs.	S.C. Code Ann § 58-37-20 Docket No. 2008-251-E (Order No. 2009-373)
South Dakota	All investor-owned utilities	2009, most recent version in 2014	The lost revenues are negotiated as a percentage of approved budget spending. Savings are not included in the calculation of lost revenues, although they are estimated to ensure cost-effective programs. Recovery is limited to the year expenses are incurred.	Docket NG09-001 Docket EL11-002

Appendix B. Case Studies from Selected States

NEVADA

History

In 2009, the Nevada legislature passed SB 358. The law required the Public Utility Commission of Nevada (PUCN) to remove financial disincentives caused or created by the reasonable implementation of energy efficiency and conservation programs. The legislation specified that the rules had to include cost recovery for program expenses and removal of financial disincentives, and also noted that commission rules could—but were not required to—include financial incentives to help promote the participation of customers in energy efficiency programs. The legislature also stipulated that the regulation to be adopted by the PUCN could not authorize the utility to earn more than the rate of return authorized by the commission (NRS 704.785). In response to the 2009 legislation, the PUCN adopted rules creating a lost revenue adjustment mechanism.

The legislation was spurred in part by a changing population and economic dynamics within the state. Prior to 2009, the population of Nevada had been increasing dramatically from year to year, and electricity consumption had followed suit. During that time, the effect of lost revenues from efficiency programs was somewhat dampened by ever-increasing consumption. Utilities were allowed to book energy efficiency expenditures as an investment to earn a rate of return-on-equity 500 points higher than that authorized for supply-side investments. But lost revenues were not directly addressed. However, due to the recession, population growth stopped for a year and then resumed at a much slower rate. As a result, it became apparent that the state needed a more comprehensive approach to encourage further investment in efficiency.

Other Relevant Regulatory Features

Nevada has had a renewable portfolio standard (RPS) in place since 1997. In 2005, the RPS was revised, increasing portfolio requirements and allowing utilities to use energy efficiency to meet a portion of these requirements. Currently, cumulative energy efficiency savings can meet up to a quarter of the total standard in any given year. In other words, utilities may assign cumulative savings of about 6.25% of electricity sales toward meeting the requirement through 2025. While the RPS allowances may have spurred utilities to bulk up efficiency programs, utilities have now achieved the maximum level of efficiency allowed to count toward the requirement, meaning the policy has little effect in encouraging continued investments in efficiency. In 2013, the legislature voted to completely phase out efficiency from the RPS in coming years, further diminishing the effect the policy may have had in spurring investments in efficiency. Advocates and others have said there may be some discussion of a separate efficiency standard in coming years, but no specific docket has been opened on the subject.

LRAM Policy Details

The PUCN first authorized a lost revenue adjustment mechanism for electric utilities in May 2011 (Dockets 10-10024 and 10-10025). The state's two investor-owned electric utilities, Nevada Power Company and Sierra Pacific Power Company, both recover lost revenues from efficiency programs using the same mechanism type. The two utilities also share a parent company, NV Energy. Lost revenue in Nevada is recovered through the Energy

Efficiency Program Rate (EEPR). Program costs are recovered through the Energy Efficiency Implementation Rate (EEIR). Nevada uses the net savings achieved by energy efficiency and conservation programs in the determination of lost revenues.

The company begins with a revenue requirement for each customer class and removes customer charge revenue, customer-specific facilities revenue, and fuel costs from the class revenue requirement. The remaining dollar figure is divided by total sales of each rate class. This per-kWh rate is reduced by a variable operations and maintenance component the utility has derived from a marginal cost of service study. Each class-specific rate is then applied to a program savings forecast for each class.

Lost revenues continue to be collected for pancaked savings effects until the company comes in for a rate case and resets the billing determination. Companies are mandated to file a rate case with the commission at least every three years. There is also a requirement that lost revenues cannot cause a utility to earn more than its authorized rate of return. The result in Nevada has been the return of lost revenues—in part or in whole—to customers in 2013 and 2014. Details of policy results, including energy savings and lost revenue dollars recovered, are reported in the following section.

Outcomes

Nevada's lost revenue adjustment mechanism is complex and requires significant time and effort from both utility and commission staff. While utilities have expressed that the lost revenue adjustment mechanism is necessary for them to become whole after investing in energy efficiency, the arduous regulatory requirements of the LRAM have led the PUCN to open an investigatory docket looking at other ways for Nevada electric utilities to recover lost revenues. Concerns regarding whether utilities are over-earning as a result of the LRAM have led to recent settlements and the return of LRAM monies to customers. Meanwhile, statewide electricity savings have declined since 2010.

ENERGY SAVINGS

While utilities in Nevada continue to invest in cost-effective energy efficiency, it is unclear whether the LRAM is a sufficient policy lever to encourage them to ramp up investments. Overall incremental electricity savings in Nevada, while still higher than the national average, have dropped in recent years.[19] Since avoiding rate hikes was a key concern for all parties in Nevada, some programs may actually have been scaled back as a result of the LRAM. There was some concern over the optics of customer funds being used to recover large amounts of lost revenues, and efficiency portfolios were scaled down somewhat from electric utilities' initial proposals. Annual incremental energy savings are shown in figure B1.

[19] In 2010, statewide electricity savings were second highest in the country, totaling about 1.28% of retail sales. In 2013, Nevada ranked 21st, with total incremental electricity savings of 0.81%. (See the State Energy Efficiency Scorecard for more details). Note also that since 2010, the PUCN has determined that CFL measures no longer count toward savings claimed by utilities.

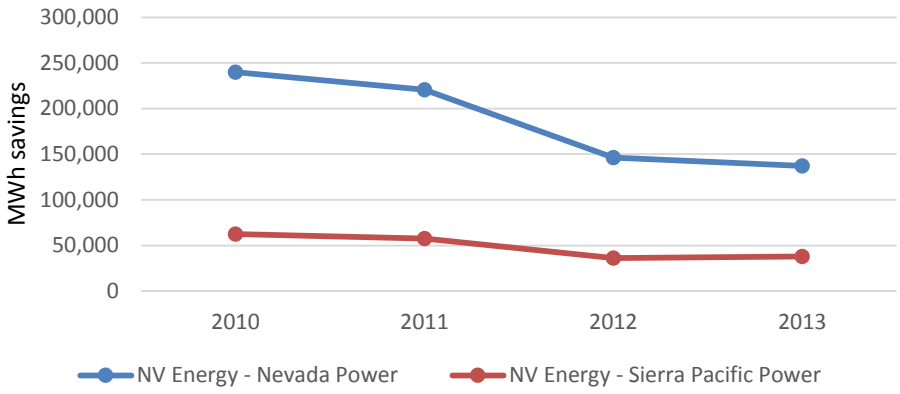

Figure B1. Net incremental savings (MWh) in 2010–2013 for Nevada energy companies. *Sources:* Utility annual reports.

FINANCIAL OUTCOMES

The most recent estimates of lost revenue recovery from efficiency programs are presented in table B1. The legislation and the PUCN rules that followed are clear that utilities are eligible to recover the full retail rate for energy savings achieved. However there were concerns that the companies were over-earning in recent years as a result of the LRAM. The state's consumer counsel asked the commission to open a proceeding to determine if the utilities were eligible for lost revenues in a year in which they achieve their authorized rate of return. Subsequently, the commission adopted a follow-up rule requiring the companies to return funds to ratepayers in the event of over-earning. The companies were required to refund to customers the lost revenue amounts collected for 2012. As a condition of a merger approved by the PUCN, the companies agreed to forgo lost revenues in 2013 and half of lost revenues in 2014. In 2015, the utility is slated to collect and retain lost revenues as normal.

Table B1. Lost revenue recovered in recent years

Utility	Lost revenue dollars eligible for recovery[1]	Cost of energy efficiency programs	Total annual energy savings achieved (kWh)[2]	Eligible LRAM recovery per energy unit saved[3]
		2013		
Nevada Power Company	$14,692,023 (returned to customer base)	$34,376,982	358,021,585	$0.04
Sierra Pacific Power Company	$5,566,833 (returned to customer base)	$5,017,084	110,812,881	$0.05
		2014		
Nevada Power Company	$19,546,227 (portion returned to customer base)	$50,300,000[4]	484,415,682	$0.04
Sierra Pacific Power Company	$2,484,850 (portion returned to customer base)	$10,410,000[4]	60,797,089	$0.04

[1] Estimates of dollars recovered or budgets. [2] Energy savings figures do not match those shown in figure B1 since lost revenues are calculated based on annual, not incremental, energy savings. [3] Estimate of what utility would have recovered if dollars were not returned to customers. [4] Estimate of energy savings.

Discussion

Nevada now has several years of experience implementing a lost revenue adjustment mechanism. However the LRAM remains contentious. Parties identified evaluation procedures and the timing of rate cases and demand-side management cases as pieces of the regulatory structure that need improvement. Evolving utility portfolios that include next-generation program offerings have also raised questions about the type of programs eligible for lost revenue recovery.

EVALUATION, MEASUREMENT, AND VERIFICATION

Nevada's LRAM has had a significant effect on the time and money spent on evaluation procedures for efficiency programs and has led to some level of controversy and conflict among parties. Utilities have more than doubled their expenditures on EM&V, and the public utilities commission has likewise increased its staff to accommodate the additional workload. Getting the energy savings values correct is important to avoid over- or under-recovery of lost revenues by utilities (and the potential overpayment by ratepayers), but parties in Nevada are at odds as to the proper level of time and resources to devote to EM&V. Key elements of EM&V, including inputs and general methodology, have also been adjusted over time. This has led to confusion and the impression of subjectivity in calculations in some cases.

EVOLVING PROGRAM OFFERINGS

As utility portfolios mature, it is natural to move toward more cutting-edge program offerings. Utilities in Nevada have recently begun offering home energy reports and programs aimed at changing consumer behavior. While energy savings from these types of programs and the necessary EM&V processes have been demonstrated and accepted in states across the country, some parties in Nevada have questioned the amount of allowable revenue recovery for these program types.

PROCESS ISSUES

The timing and process of truing up lost revenues have been complex. Two proceedings occur each year: one focused on demand-side management portfolios, the other focused on lost sales and rates. Currently, the PUCN will continue to adjust and true up lost revenue dollars for a single program year over the course of three or more years. Parties have expressed the need to better synchronize efficiency program years and rate years.

Looking Forward

The PUCN opened an investigatory docket in 2014 to take a closer look at the state's lost revenue adjustment mechanism. All parties have expressed that the current LRAM is overly complex and that there is significant room for improvement. In 2015, the PUCN issued a notice of its intent to act upon a new mechanism (Docket 14-10018). The mechanism would provide a rate of return on the program costs for DSM programs. Some parties have expressed that they believe the PUCN has the authority and latitude to implement a decoupling policy without going back to the legislature, but many others have questioned whether the commission has such latitude under existing authority.

OKLAHOMA

History

Energy efficiency programs are required by Oklahoma Administrative Code, although specific efficiency portfolios and their associated energy savings are determined largely by investor-owned utilities (IOUs). Under OAC 165:35:41, all electric utilities regulated by the Oklahoma Corporation Commission (OCC) must propose and implement energy efficiency and demand response programs within their service territories, with new proposals issued at least every three years. Energy efficiency programs were initiated throughout the state in 2008, after the OCC launched a stakeholder collaborative to explore potential structures for demand response programs within the state.

From the beginning, stakeholders recognized the need to motivate utilities to implement efficiency. With stakeholder input, the OCC laid out a loose set of efficiency rules and encouraged utilities to come forward with their own proposals for incentivizing investments in energy efficiency. Utilities presented the commission with a three-legged stool: in addition to cost recovery, they proposed a shared savings mechanism and a lost revenue adjustment mechanism.

Other Relevant Regulatory Features

Oklahoma does not have an energy efficiency resource standard in place or specific energy savings targets, but utility efficiency investments are influenced largely by a shared savings incentive put in place during the same time as the LRAM. There are no performance thresholds for receipt of the shared savings incentive. Specifics of the performance incentive are detailed in Nowak et al. (2015). Currently, there is an open docket examining the structure of the performance incentive, with a proposal to cap the potential return.

LRAM Policy Details

Oklahoma's LRAM was first approved as part of a settlement in PUD Cause No. 200700449, Order No. 555302. The policy applies to both investor-owned electric utilities in Oklahoma: Public Service Company of Oklahoma (PSO) and Oklahoma Gas and Electric Company

(OG&E). Gas utilities have performance-based rates, and LRAM rules do not apply. Lost margins are calculated by multiplying energy savings resulting from demand response programs by an embedded cost factor determined in the most recent rate case. Savings are reported by utilities to the OCC, and while third parties have been used to verify energy savings, utilities are also given the option to self-verify. Lost revenues are recovered annually, with no ceiling specified. However lost revenues are zeroed out as part of each rate case.

Outcomes

Energy efficiency has received greater attention in Oklahoma in recent years, driven by OCC rulemakings and support from Governor Mary Fallin. The LRAM is an important tool in encouraging utilities to invest in efficiency, especially when coupled with the shared savings incentive. Over several years of implementation, the need for clear requirements and process transparency has become evident. Furthermore, although energy savings have ramped up, IOUs have yet to achieve the energy savings currently being realized in other states across the country.

ENERGY SAVINGS

Oklahoma has seen an uptick in energy savings in recent years. Statewide, net electricity savings grew from 0.04% of sales in 2009 to 0.27% of sales in 2013 (Sciortino et al. 2011; Gilleo et al. 2014). This has been driven largely by increased investment in efficiency by the state's investor-owned utilities. Because Oklahoma began implementing performance incentives and LRAM at around the same time, it is difficult to determine which of the two has had a greater influence on utility behavior. However stakeholders in the state firmly believe growth in efficiency is driven by the entirety of the three-legged stool of cost recovery, incentives, and LRAM, and that no one policy lever could drive efficiency without support from the others. Annual incremental energy savings for the two IOUs are shown in figure B2.

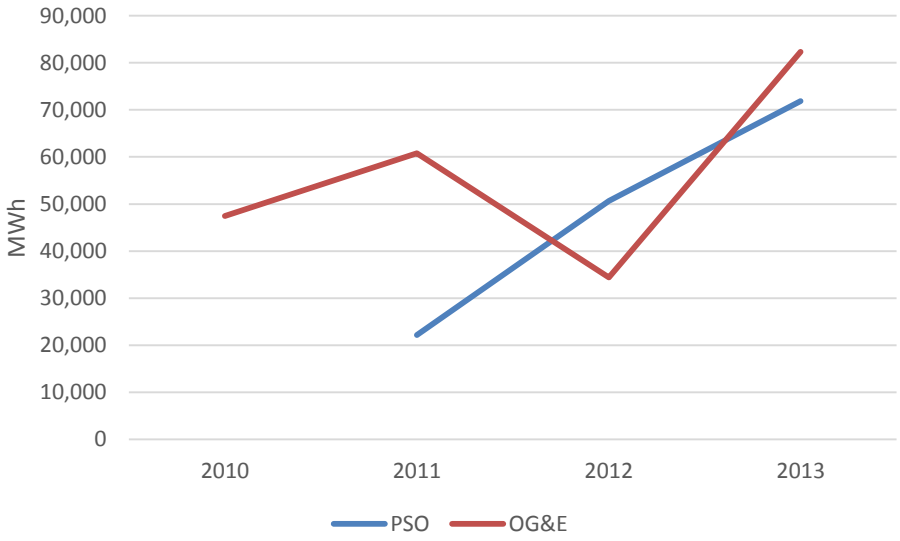

Figure B2. Net incremental savings (MWh) in 2010–2013 for Oklahoma electric IOUs. 2010 energy savings were not available for PSO. *Sources:* Utility annual reports and OK OCC data.

Figure B2 also characterizes energy savings patterns as a result of the three-year planning process. The drop in OG&E savings in 2012 is likely due to its overachievement of savings in earlier years, reducing pressure to generate savings during the third year of the program cycle. In 2013, OG&E achieved significant (and likely unexpected) energy savings as a result of its SmartHours program, which was originally targeted at reducing peak demand.

While savings have grown noticeably in the state since 2009, the question of whether efficiency is being encouraged *sufficiently* still exists. IOUs have ramped up programs in response to the policy levers in place in the state, but Oklahoma statewide electricity savings were well below the national average of 0.56% of retail sales in 2013 (Gilleo et al. 2014). Stakeholders were unsure whether energy savings would continue to climb solely on the basis of the existing policy environment in Oklahoma.

FINANCIAL OUTCOMES

The most recent estimates of lost revenue earnings from efficiency programs are presented in table B2.

Table B2. Lost revenue recovered in recent years

Year	Lost revenue dollars recovered*	Cost of energy efficiency programs	Total energy savings achieved*	LRAM earnings per energy unit saved
		OG&E		
2011	$3,105,699	$18,200,806	60,743,474	0.05
2012	$3,342,530	$14,662,068	34,405,983	0.10
		PSO		
2012	$4,348,385	$21,963,690	50,632,000	$0.09
2013	$6,301,020	$22,335,179	71,880,000	$0.09

* OG&E 2013 recovery request was still under review at the time of research, so 2013 LRAM numbers were not available.

Discussion

After several years of LRAM in Oklahoma, stakeholders point to a number of areas where lessons have been learned. Stakeholders have been proactive in applying several of these lessons, making tweaks to the existing rules. Many of these adjustments address methods of smoothing the regulatory process. However those aimed at encouraging IOUs to achieve higher levels of electricity savings have faced significant opposition from several parties.

CONSISTENT AND CLEAR EXPECTATIONS

Oklahoma stakeholders emphasized the importance of clear definitions and standards that apply to all utilities affected by an LRAM. For instance, though stakeholders were under the impression that OCC rules intended that LRAM apply to net savings, original rules did not specify whether utilities should report lost revenues calculated from net or gross energy savings. As a result, one IOU reported net energy savings while another reported gross energy savings. In 2014, the utilities commission approved new demand rules for future portfolio filings that specifically require the use of net savings for calculation of lost

revenues. IOUs also differed in their calculations of embedded costs. Stakeholders felt that more clearly defining requirements and expectations during the rule design process might have been simpler than making changes after the fact and might have led to the sense of a more even playing field.

EVALUATION, MEASUREMENT, AND VERIFICATION

Recently, auditing of efficiency program evaluations has received greater attention from OCC staff. In prior years, utilities self-verified energy savings numbers. However IOUs are now required to hire independent contractors to evaluate programs and verify energy savings. Some stakeholders in the state noted that even this requirement may not lead to truly independent verification of savings. Utilities have also been tasked with diving more deeply into their assessment of net savings, accounting for free-ridership and the overlap between programs. The OCC has bulked up its efficiency-focused staff to handle increased back-and-forth with utilities related to demand response program filings.

TRANSPARENCY

Though utilities and the OCC have worked to create consistency in reporting systems, other stakeholders have expressed frustration that many filings are not publicly available. To date, utility EM&V reports have not included numbers for lost revenues, making it difficult for outside parties to track processes and leading to surprises when utility lost revenue filings are significantly higher than predicted. New rules require that EM&V filings include data on lost revenues and performance incentives, which should help ease these tensions in the future.

Looking Forward

The OCC recently approved new rules that apply to both electric and gas companies in future efficiency portfolio filings.[20] These rules do not largely change the structure of the LRAM within the state, but they do clarify definitions and methodologies. Important changes have also been made to the performance incentive in the state. In addition, efficiency advocates have proposed mandatory energy savings targets in recent years. While these targets were incorporated into a draft OCC rulemaking, they were later dropped. Stakeholders have indicated it is unlikely that Oklahoma will consider energy savings targets in the near future.

INDIANA

History

Back in 1983, Indiana was actually one of the first states to enact a Certificate of Convenience and Public Necessity statute, which required utilities to demonstrate need before constructing or purchasing new generation facilities. In 1995, Indiana adopted an Integrated Resource Planning (IRP) rule (170 IAC 4-7), requiring electric utilities to develop an IRP that evaluated demand-side and supply-side resources on a comparable basis.

In spite of that framework, the fact that Indiana utilities were achieving very little energy efficiency savings led to a series of hearings and investigations by the Indiana Utility

[20] See OAC 165:45-23 (Gas Demand Rules) and OAC 165:35:41 (Electric Demand Rules).

Regulatory Commission (IURC) beginning in 2004, culminating in a landmark order in 2009 (Cause 42693, December 9, 2009). The order established a two-part approach: Utilities were required to contract with a single, independent, third-party administrator for a basic set of statewide "Core" programs, and also to individually administer additional energy efficiency programs ("Core Plus") in their own service territories to address aspects not covered by the Core initiatives. The order also established an energy efficiency resource standard (EERS), requiring utilities to meet annual savings goals. The goals began at 0.3% of annual sales in 2010, increasing to 1.1% in 2014 and leveling off at 2.0% in 2019.

With regard to lost revenues, Indiana had actually established an administrative rule for lost revenue recovery in 1995 (170 IAC 4-8-6) as part of its guidelines for demand-side management cost recovery. However, as noted above, very little DSM was taking place. Now, subsequent to the 2009 order, four of the five major electric utilities (Indiana Michigan Power [I&M], Northern Indiana Public Service Company [NIPSCO], Vectren Indiana, and Duke Energy Indiana) have approved mechanisms. Indianapolis Power and Light (IPL) sought commission approval of a mechanism but was denied (Cause No. 43523), in part because of the long period of time since its last rate case and the resulting uncertainty of the lost margin calculation based on those dated rates. (IPL subsequently filed an updated request, Cause No. 44497.)

In March 2014 the Indiana legislature voted (SB 340) to end many of the aspects of the IURC 2009 order, effectively eliminating both the Core program requirement and the annual savings goals that order had established. Governor Mike Pence neither signed nor vetoed the bill, and it became law in April 2014. While the legislation did not alter the state's lost revenue policy, the entire framework for utility energy efficiency programs in Indiana is somewhat uncertain at this point.

LRAM Policy Details

The utilities all follow the Indiana general administrative guidelines (170 IAC 4-8-6), with the details on each mechanism spelled out in each individual utility case filing (e.g., Duke: Cause No. 43955; Vectren: Cause Nos. 43938 and 43405; I&M Cause No. 43827). These case filings also represent their initial three-year plans following the issuance of the 2009 landmark order. The utilities must provide evaluation data on the energy savings impacts of their programs (Core and Core Plus), net of free riders, and those amounts are used to calculate the total lost revenues. Lost revenues are recovered annually for Duke, I&M, and Vectren, and semiannually for NIPSCO. Under current policy, lost revenues are recovered for the life of the measure or until the company's next rate case, whichever comes first, and there is no limit or ceiling on lost revenue recovery.

Other Relevant Regulatory Features

Four of the investor-owned electric companies in Indiana are eligible to earn performance incentives for achieving energy savings goals. Of the four, Indiana Michigan Power and IPL have a shared savings performance incentive. The other two operate under a tiered incentive approach, receiving a greater performance incentive as performance increases. There are no electric companies in Indiana with decoupled rates. However, of the three largest natural gas distribution companies operating in the states, two have decoupled rates for most rate classes. Finally, Indiana offers companies the opportunity to participate in a

voluntary renewable portfolio standard to earn a higher return on equity for rate-base facilities. Energy efficiency savings are one means by which a company can meet the voluntary standard. However no company has formally requested commission approval to participate in the standard.

Outcomes

ENERGY SAVINGS

Statewide energy savings increased dramatically in Indiana subsequent to the 2009 order. In 2012, utilities achieved electricity savings of 0.59% of retail sales, about the national average. Statewide energy savings are shown in figure B3.

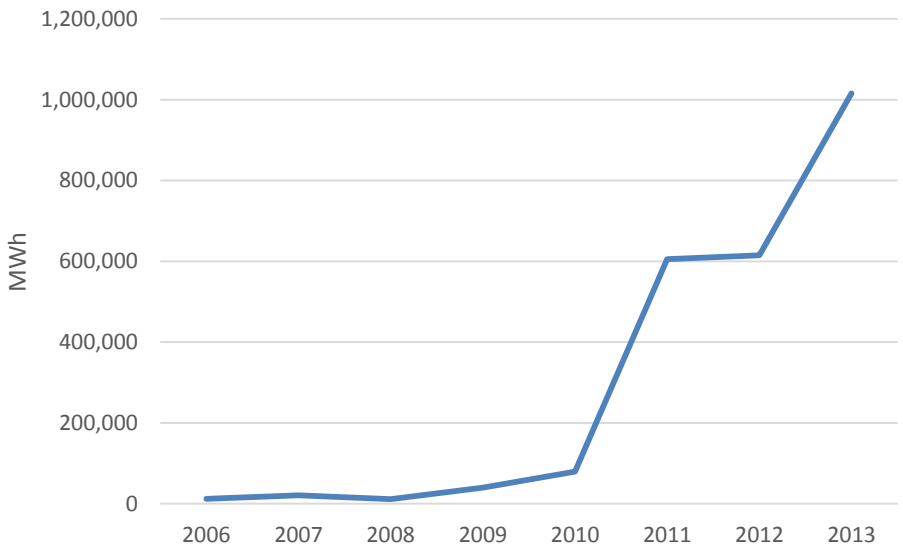

Figure B3. Indiana energy savings (MWh), 2006–2013. *Source*: ACEEE *State Energy Efficiency Scorecard* 2007–2014.

FINANCIAL OUTCOMES

Table B3 shows the dollars recovered under the LRAM for three IOUs in Indiana.

Table B3. Indiana lost margin recovery and savings 2012–2013

Company	LRAM recovered	Program cost	Total annual energy savings (MWh)
2013			
Duke Energy	$3,669,344	$36,587,777	267,711
Vectren	$6,014,360	$11,251,668	63,072
Indiana Michigan Power	$9,115,961	$22,335,442	121,472
2012			
Duke Energy	$2,521,055	$22,905,994	215,795
Vectren	$3,765,798	$11,068,667	64,864
Indiana Michigan Power	$3,819,984	$11,436,775	60,460

Amounts subject to reconciliation process where estimated lost revenues, program costs, and savings are trued up with actual lost revenues program costs and savings based on program evaluation results. *Sources:* Indiana Utility Regulatory Commission Case Filings: Duke (Cause No. 43955 DSM-2); Vectren (Cause No. 43405 DSM-10 and DSM-11); Indiana Michigan Power (Cause No. 43827 DSM -3).

Discussion

Indiana utilities have clearly significantly ramped up their energy efficiency spending and savings since the 2009 IURC order. It is unclear what role the LRAM policy has played in that, since the utilities have had that LRAM policy available since 1995.

Lost revenue recovery has emerged as a somewhat contentious issue in Indiana, with advocates expressing concern about the potential for adding considerable costs to ratepayers. Although Indiana has only a couple of years' experience with large-scale energy efficiency programs, one can see from the table that the LRAM costs are already substantial. The open-ended potential for pancaking of lost revenue costs over multiple years is of particular concern, given that there is no cap or time limit on the recovery of lost revenues. Documents filed by several utilities in recent cases indicate that if lost revenues are collected for the life of the measures, total lost revenue costs would exceed the total program costs.

True symmetrical decoupling is an alternative that avoids many of the problems of LRAM, and some advocates are considering recommending that alternative. At one time Vectren sought a decoupling mechanism for its gas and electric utilities. However decoupling was rejected for electric utilities in a 2011 IURC order (Cause No. 43839).

EVALUATION

The Core programs were evaluated by an independent third party, selected by the DSM Coordinating Committee established by the IURC (comprising the utilities and the Office of the Utility Consumer Counselor [OUCC] and involving other key stakeholders). For the Core Plus programs, each utility is responsible for hiring a third party to evaluate its own programs. However the utilities generally have oversight committees for the Core programs with members including the OUCC and often other stakeholders. These committees often participate in decisions regarding the selection of a third-party evaluator; they also review the evaluator's reports and analyses. Energy savings are defined as being net of free riders. The results of these evaluations are used both in determining lost revenues and in calculating performance incentives for the utilities.

PROCESS

The process for tracking and awarding lost revenues is already proving to be fairly complicated. IURC staff noted that timely EM&V is particularly important to accomplish for the full portfolio of programs. If EM&V data are submitted for only some programs because the EM&V process for other programs is not complete, it results in challenges in tracking and reconciling subsequent evaluations. Also, it is important that all utilities use consistent definitions related to reported, actual, and verified savings. Although it is still early in the experience with LRAM, stakeholders acknowledge that tracking lost revenues over multiple years raises concerns about keeping track of pancaked lost revenues. They further say that trying to adjust those amounts as energy efficiency measures reach the end of their estimated lifetimes would be extremely challenging.

Looking Forward

The policy landscape for utility energy efficiency in Indiana is fairly uncertain at this point. In his letter to the legislature after the enactment of SB 340, the governor stated, "I have requested the Indiana Utility Regulatory Commission to immediately begin to develop recommendations that can inform a new legislative framework for consideration during the 2015 session of the Indiana General Assembly." This suggests that the entire framework for utility energy efficiency programs in Indiana is up for revision. It is yet to be determined whether there will be any type of utility energy efficiency requirements at all (much less annual savings targets), and what associated policies (e.g., LRAM, decoupling, shareholder incentives) will remain or will be put in place.

At this point the Indiana utilities have all filed, and had approved, one-year plans to continue some energy efficiency programs during 2015. It is noteworthy that now that the IURC annual savings targets have been struck down by SB 340, the projected savings from the voluntary utility plans are, in aggregate, about half of what would have been required under the previous IURC standard.

SOUTH DAKOTA

History

South Dakota is unusual in that energy efficiency programs are not a legislative or regulatory requirement. In the mid-2000s, the South Dakota Public Utilities Commission (PUC) tasked staff with investigating options to encourage the state's six investor-owned utilities to offer energy efficiency programs. Initially, staff suggested a standard program design. However five of South Dakota's six IOUs operate in other states, many with established efficiency programs. They were opposed to the standard program design, noting it would be simpler to offer portfolios that mirrored their existing efficiency programs in other states.

The commission asked utilities to bring other options for efficiency programs to the table. Several utilities approached the PUC with the idea of performance incentives and lost revenue adjustment mechanisms. The commission originally approved performance incentives but moved away from that approach in 2010. Working in collaboration with utilities, the commission authorized an LRAM that applied to all IOUs. Unlike other states, the LRAM does not take energy savings into account.

Other Relevant Regulatory Features

South Dakota does not require utilities to offer energy efficiency programs.[21] The PUC authorized performance incentives in the past, but none is currently in place or pending. Most utilities in the state are interconnected and deliver the majority of their loads out of state; due to South Dakota's small population, they tend not to consider the South Dakota portion of their load in supply-side decisions. Many of the efficiency programs throughout the state began as extensions of existing, more robust programs in other, neighboring states.

LRAM Policy Details

South Dakota's LRAM was first authorized for Montana-Dakota Utilities in 2010.[22] The LRAM applies to all investor-owned utilities for both electricity and natural gas. Lost revenues are not based on verified energy savings. Instead, they are negotiated as a percentage of approved budget spending. Utilities estimate savings to determine the cost effectiveness of efficiency programs but are not required to submit savings details to the commission as part of LRAM proceedings. Lost revenues are recovered contemporaneously through a rider and trued up over time. Recovery is limited to the year in which expenses are incurred.

Outcomes

The South Dakota PUC is prohibited from requiring utilities to implement efficiency programs, and therefore the LRAM is the primary method by which the PUC has sought to encourage efficiency programs throughout the state. Efficiency offerings are influenced by South Dakota's demographic and geographic characteristics. The small population relative to the number of utilities, and the fact that nearly all of the state's utilities are interconnected, mean that utility experience in neighboring states is largely what drives efficiency in South Dakota. Since programs are small, the costs of evaluation are disproportionately high to utilities. Furthermore, all parties have agreed that simplicity is a practical strategy to maximize the efficiency of the programs. As a result, little emphasis is placed on verification of actual energy savings.

ENERGY SAVINGS

PUC staff have been successful in working with IOUs to initiate some level of energy efficiency programming in South Dakota. Efficiency budgets have slowly but steadily increased in recent years. Figure B4 illustrates relatively consistent savings levels. South Dakota's statewide savings remain well below the national average of 0.56% savings as a percentage of retail sales.

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[21] In 2009, the PUC did adopt a modified Public Utilities Regulatory Policies Act (PURPA) standard requiring IOUs "to integrate cost-effective energy efficiency resources into [their] plans and planning processes," but there is no rule or law requiring specific energy efficiency programs or savings levels.

[22] See docket NG09-001 (http://puc.sd.gov/Dockets/NaturalGas/2009/ng09-001.aspx).

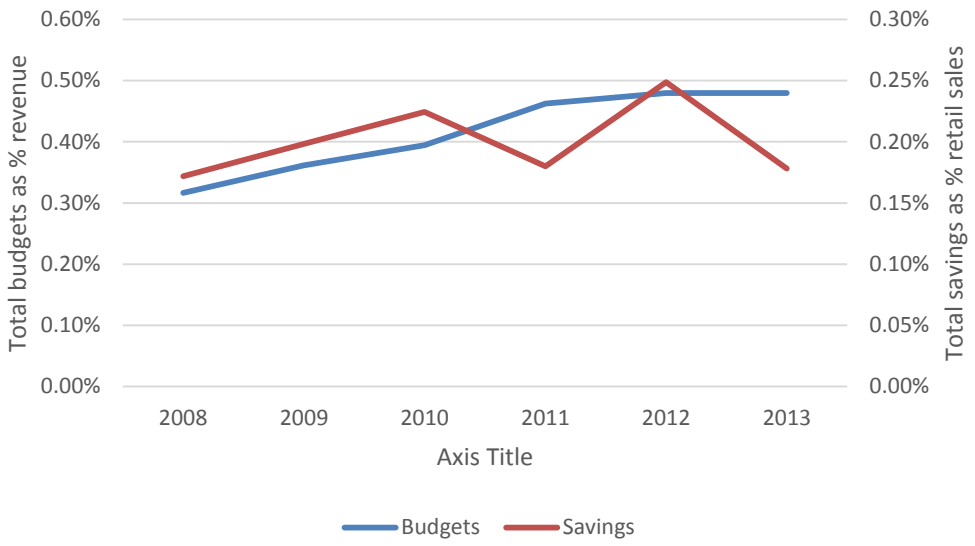

Figure B4. Total statewide spending and savings on energy efficiency, 2008-2013. *Source:* ACEEE *State Energy Efficiency Scorecard*, 2008–2014.

FINANCIAL OUTCOMES

South Dakota's LRAM is a function of utility budgets for energy efficiency rather than energy savings achieved. Dollars recovered, program budgets, and non-verified estimates of energy savings are shown in table B4. Recovery is based on budgets rather than actual spending, so any overspending by utilities does not result in greater allowable lost margin recovery. Similarly, while programs must be cost effective, the commission places little emphasis on verification of energy savings.

Table B4. Sample of lost revenue recovered in recent years

Utility	Lost revenue dollars recovered*	Cost of energy efficiency programs	Total energy savings achieved*	LRAM earnings per energy unit saved
		2013		
Otter Tail Power	$84,000	$281,548	1,611,525	$0.05
Montana-Dakota Utilities	$14,264	$168,026	46,130	$0.31
		2012		
Otter Tail Power	$84,000	$309,911	3,910,104	$0.02
Montana-Dakota Utilities	$6,056	$51,554	30,840	$0.20

*Estimates

Table B4 also shows the small size of programs in South Dakota. Each utility serves a relatively small customer base, and opportunities to work with industrial customers are limited. The small size of efficiency programs is one of the main reasons little emphasis has

been placed on actual energy savings to date. Parties noted that lost margin recovery to date has been relatively minimal, and there has not been much scrutiny by external stakeholders.

Discussion

The driving force behind South Dakota's LRAM has been an emphasis on simplicity. To date, this seems to have worked for the state. Customer bases are limited, programs are small, and outside stakeholders pay little attention to regulatory features like lost margin recovery. However, in exchange for simplicity, the state has made a significant tradeoff: verification of energy savings.

SMALL SERVICE TERRITORIES AND NEIGHBOR STATE INFLUENCE

Programs in South Dakota are shaped largely by neighboring states. Utilities also provide service to Iowa, Illinois, Minnesota, and Montana, all of which have relatively robust energy efficiency programs that predate those in South Dakota. These experiences were shifted over the border to shape portfolios in South Dakota. However modifications were made to account for the small population of the state. For example, because the industrial base is small, programs targeted at this sector are limited.

EVALUATION, MEASUREMENT, AND VERIFICATION

Unlike many other states, there is little back-and-forth between the commission and utilities regarding verification of savings. There is evaluation of savings at some level—utilities must, for example, estimate savings in order to determine whether programs are cost effective. However no evaluation of savings is required by the commission. Parties indicated that even if savings estimates are off by an order of magnitude, programs would still be cost effective within the state. There has been very little public scrutiny of the budget-based LRAM methodology, likely due to the small size of efficiency programs.

Looking Forward

Though both utilities and commission staff say they recognize the importance of efficiency, there is no clear sign that efficiency will continue to gain traction in the state under the current regulatory structure. However all parties note that potential federal regulations, like the Clean Power Plan, could be a possible turning point. Federal regulations could not only require the ramp-up of programs but also necessitate more careful calculations of energy savings. These potential changes seem to have already influenced utility behavior to some extent, with utilities indicating that they have paid more attention to internal savings verification recently.

ARKANSAS

History

Investor-owned utilities in Arkansas had very little involvement in providing customer energy efficiency programs until 2007, when the Arkansas Public Service Commission (APSC) approved Rules for Conservation and Energy Efficiency Programs requiring electric and gas utilities to propose and administer energy efficiency programs (Docket No. 06-004-R, Orders No. 1, 12, 18). The state's jurisdictional IOUs filed Energy Efficiency Plans in July 2007 containing proposed Quick Start efficiency programs. The utility response was relatively small, with the utilities expressing concern about adverse financial impacts. In

response, in 2010 the commission took several actions to increase the energy efficiency efforts.

Also in December 2010, the APSC adopted an energy efficiency resource standard (EERS) for both electricity and natural gas, guidelines for efficiency program cost recovery, and a shareholder performance incentive. The EERS targets set by the commission were moderate, calling for an annual reduction of 0.25% of total electric kWh sales in 2011, 0.5% in 2012, and 0.75% in 2013. In 2013 the APSC extended the 0.75% target to 2014 and set a target of 0.9% for 2015. It deferred a ruling on 2016–2017 targets pending completion of a thorough potential study aimed at improving programs.

In December 2010 the Arkansas PSC approved a joint electric and gas utility motion to allow the awarding of lost contributions to fixed costs that result from future utility energy efficiency programs. All investor-owned utilities are approved to recover lost revenues as part of the annual energy efficiency program tariff docket (see Order No. 14 Docket 08-137-U). In 2007 the APSC approved a decoupling mechanism for the three major natural gas distribution companies in the state, but no decoupling has been approved for electric utilities.

In December 2010 the APSC began a process by which it would approve incentives to reward achievement in the delivery of essential energy conservation services by investor-owned utilities (see Order No. 15 Docket 08-137-U). Such incentives were approved for all three gas utilities in the state and the two largest electric utilities in 2012 and 2013.

LRAM Policy Details

The APSC established its LRAM policy in 2010 (Docket No. 08-137-U, Order No. 14, December 10, 2010). All investor-owned electric and gas utilities are eligible under the policy to apply to receive lost contributions to fixed costs (LCFC). There are no minimum energy savings thresholds or other achievements required to qualify for receiving lost revenues.

The LCFC is calculated as the base rate (i.e., the total rate minus variable costs [typically just fuel costs]) times the net savings from the energy efficiency programs. Lost revenues are calculated and recovered annually. The utility is eligible to receive lost revenues for the life of the measure, and there is no limit or ceiling on the amount of lost revenues that can be recovered, except that the LCFC resets to zero at each new rate case.

Other Relevant Regulatory Features

Arkansas has had an EERS in place since 2010 for both gas and electric utilities. The energy savings targets are established by the APSC in three-year cycles. The three natural gas distribution companies in Arkansas are decoupled and eligible to earn performance incentives for efficiency program results. There are no decoupled electric companies in Arkansas but the four electric IOUs do have LRAMs in operation and are able to earn performance incentives.

Outcomes

ENERGY SAVINGS

Statewide electricity savings are shown in figure B5. Energy savings in Arkansas are driven largely by the state's EERS requirements. A 2014 study found that, on the whole, Arkansas met or came close to meeting savings targets in 2011 and 2012 (Downs and Cui 2014). The extent of the LCFC's role in the utilities' commitment to meeting these targets is unclear, particularly since there is no minimum threshold for receiving lost margin.

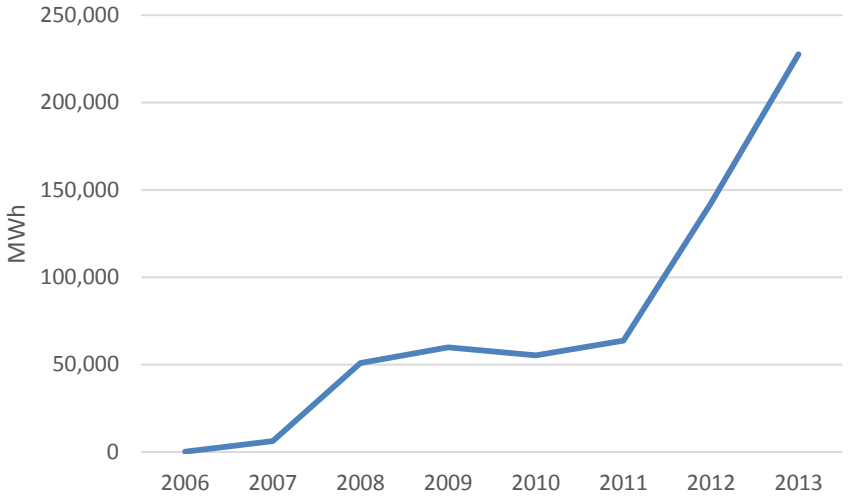

Figure B5. Arkansas energy efficiency program savings 2006–2013. *Source:* ACEEE *State Energy Efficiency Scorecard* 2007–2014.

FINANCIAL OUTCOMES

Dollars recovered through the LCFC are shown in table B5. As savings targets rise, program budgets have ramped up significantly. Resulting lost revenue dollars have also increased in recent years.

Table B5. Arkansas electric utility lost revenue and savings 2012–2013

Company	LRAM recovered	Program cost	Total annual energy savings (MWh)
2013			
Entergy Arkansas	$10,534,980	$52,285,262	188.468
SWEPCo	$1,015,859	$6,803,249	25,387
2012			
Entergy Arkansas	$3,665,223	$28,515,019	107,627
SWEPCo	$545,377	$5,289,095	17,767

Source: Arkansas Public Service Commission

Discussion

The major electric utilities in Arkansas have definitely increased their energy efficiency efforts and achievements in response to the various commission orders and policies that have been in place since 2007. How much of that might be attributable to the LRAM policy is difficult to say, but staff did indicate that doing something about the lost revenue from energy efficiency was an important factor for the IOUs.

The APSC established its LRAM policy in 2010 in response to a joint motion by the major investor-owned utilities. At the time, the commission stated:

> While decoupling may eventually prove to be a better way to tame the "throughput incentive," the Commission at this time accepts the EE Utilities' argument that an LCFC mechanism is more appropriate for electric utilities, which expect growth in sales . . . . The Commission commits to approval of LCFC recovery only in the context of significant goal setting and the development of robust EM&V, as detailed in other orders issued contemporaneously with this Order. Thus, recovery of revenues lost is not an independent right of utilities, but rather a component of a coordinated group of policies reasonably calculated to deliver overall benefits to ratepayers, to utilities, and to society in a cost-effective manner. (Docket No. 08-137-U, Order No. 14, p.17-18)

The commission clearly had some reservations about allowing LRAM in the first place, and it certainly left open the possibility of revising the policy in the future. And APSC staff expressed concerns about the asymmetrical nature of LRAM (i.e., utilities collect for sales lost to energy efficiency but have no obligation to refund excess revenues if sales exceed forecasts) and the potential for LRAM costs to mount over time due to pancaking.

A more recent commission order, in 2013, sought to encourage utilities to file decoupling proposals:

> In the expectation that further rate cases will be filed by electric utilities in 2013 and 2014, the Commission issues this order to encourage proposals by electric utilities …that would decouple revenues from sales volumes. (Docket No. 08-137-U, Order No. 19, p.1)

And the commission specifically asked for "proposals that include the following features":

- Customer charges that are set at a level low enough to encourage conservation[23]
- Establishment of separate revenue-per-customer amounts for—at a minimum—residential, small commercial, and demand-metered commercial customers

[23] Fixed charges are the portion of the customer's utility bill not tied to consumption. It is noteworthy that the commission appears here to be taking a preemptive stance against proposals for high fixed charges, or "straight fixed-variable" rate design (which are sometimes requested by utilities as mechanisms to counter the problem of lost revenues from energy efficiency programs and/or customer-sited solar photovoltaic installations).

- Establishment of a true-up mechanism that credits to or collects from customers any over- or under-recovery of revenue, respectively

EVALUATION

The evaluation process is overseen by the APSC. The commission requires each utility to hire its own independent EM&V contractor to perform evaluations. It further requires the utilities to jointly fund an independent EM&V monitor who provides oversight and guidance and operates under the direction of the commission staff. The commission established an EM&V collaborative (Parties Working Collaboratively, or PWC) to develop a technical resource manual that is updated annually and approved by the commission. Arkansas uses net savings as its evaluation metric.

Looking Forward

As noted above, the commission has expressed interest in receiving proposals from the electric utilities for true symmetrical decoupling, to replace the existing LRAM mechanisms. Thus far, one of the two largest utilities in 2014 did indicate it would file a decoupling proposal in a future rate case. However it should be noted that there will be substantial turnover among commissioners for 2015, so there is the potential for a sea change in the amount of support for efficiency coming from the APSC.

MISSOURI

History

Major legislation enacted in 2009 marked a major turning point for utility energy efficiency programs in Missouri. The Missouri Energy Efficiency Investment Act (MEEIA, SB 376) established a regulatory framework for utility energy efficiency programs to consider demand-side investments in the same framework as traditional investments in supply and delivery infrastructure. The corresponding Public Service Commission (MPSC) rules for implementing the legislation became effective in May 2011. Prior to passage of MEEIA, Missouri had limited energy efficiency programs for utility customers even though electric utilities were required to file and implement integrated resource plans.

Key provisions of MEEIA specifically address the utility business model. Under MEEIA the Public Service Commission is to

- Provide timely cost recovery for utilities
- Ensure that utility financial incentives are aligned with helping customers use energy more efficiently
- Provide timely earnings opportunities associated with cost-effective, measurable, and verifiable efficiency savings

MEEIA opened the door for electric utilities to propose and establish demand-side investment mechanisms (DSIMs) for energy efficiency programs. Addressing the utility business model was critical for Missouri's utilities to move ahead with such programs. One of Missouri's utilities, in fact, had established a fairly large portfolio of programs at the time MEEIA was enacted. Ameren Missouri had launched a portfolio of customer programs totaling about $70 million over a three-year period (2009–2011). However the company rolled back this level of program spending and associated activity when cost recovery and

incentive mechanisms were not approved during Ameren Missouri's 2011 rate case. When the commission approved an agreement between the utility and parties to its MEEIA application that established DSIMs, the impact was significant. Ameren soon launched a full portfolio of energy efficiency programs totaling $145 million over the three-year program period.

The story is similar for Kansas City Power & Light (KCP&L), which had limited energy efficiency programs and associated investment in place prior to establishing its own version of a DSIM late in 2014. Once this mechanism was in place, KCP&L initiated a portfolio of energy efficiency programs totaling $28.6 million over 18 months, after which time the company is expected to file a full three-year plan. KCP&L Greater Missouri Operations (GMO), a utility operating company owned by the same corporation as KCP&L, serves an area surrounding Kansas City. GMO had in place a small set of programs prior to establishing a DSIM. With cost recovery in place, the company is proceeding with a greatly expanded set of programs.

Other Relevant Regulatory Features

The DSIMs in place for Missouri's utilities contain provisions not only for recovery of program costs and lost revenues resulting from the programs, but also the opportunity for shareholder incentive awards. These incentive awards are based on a percentage of net shared benefits. Lost revenues are calculated using deemed savings, while shareholder incentive awards are determined based on program evaluations.

MEEIA's provisions supporting energy efficiency are not mandatory but are designed to make energy efficiency a good business investment. The statute states:

> The Commission shall permit electric corporations to implement Commission-approved demand-side programs proposed pursuant to this section with a goal of achieving all cost-effective demand-side savings.

Decoupling requires periodic adjustments to true up rates and allowed revenues; these adjustments are viewed as rate-making outside of general rate cases. Some parties believe Missouri's existing statutes could be interpreted so as to allow decoupling. To date there have been no decoupling proposals associated with DSM programs submitted to or considered by the commission.

LRAM Policy Details

The basic structure of the DSIMs established for Ameren Missouri, KCP&L, and GMO is the same, but details differ.

Ameren Missouri's DSIM was established by a unanimous stipulation and agreement among Ameren Missouri, the staff of the Missouri Public Service Commission, and other stakeholders. The DSIM (Case No. E0-2012-142) approved by the commission addresses program cost recovery, the throughput disincentive, and a performance incentive. The provision addressing net shared benefits relating to the throughput disincentive (TD) is an LRAM structured as follows:

- A sum of $30.45 million shall be added to the revenue requirement determined as if the approved MEEIA Plan did not exist and in each subsequent Ameren Missouri general rate case where new base rates will become effective before the end of the three-year period.
- The $30.45 million is equal to 90% of the estimated amount of Ameren Missouri's "throughput disincentive—net shared benefit" share. It is the annualized value of a three-year annuity of 26.34% of the actual pretax net shared benefits to be recovered to offset the throughput disincentive.
- Net shared benefits are the present value of the lifetime avoided costs for the approved MEEIA programs, using the deemed values in the technical resource manual (TRM) less the present value of all utility costs of administering the MEEIA programs. Avoided costs include energy, capacity, and transmission and distribution.[24]
- The revenue requirement addition is to be trued up according to actual monthly counts of energy efficiency measures installed and the actual monthly programs' costs based on reports provided by program implementers.

Savings used to determine the DSIM applicable to the throughput disincentive are based on measure-level deemed annual energy and demand savings and measure life. The rates for avoided energy saving and rates for avoided demand savings are deemed values. Lost revenues are recovered through either a rider or a tracker mechanism. There is no threshold requirement to receive lost revenues, and there is no limit or ceiling for lost revenue. Lost revenue recovery continues for the deemed measure life after initial program year's savings through a rider or tracker mechanism.

The Missouri PSC authorized similar DSIMs for GMO in January 2013 and for KCP&L in July 2014. The LRAM has been in place only long enough to have one completed program year subject to this rate structure for GMO, and KCP&L has not reported results to date.

Energy Savings and Financial Outcomes

It is too early in the initial program plan periods for the utilities with DSIMs in place to assess the full impacts and associated financial outcomes. Ameren Missouri is exceeding program savings targets and is on track to receive full incentive amounts. Because the DSIMs are based on deemed savings, the cost recovery amounts received by the utilities are determined by reports on actual measures installed and costs incurred in each program year. These costs are built into rate riders or trackers for the programs and recovered contemporaneously, subject to periodic true-ups. Table B6 shows program costs, energy savings, and dollars recovered in 2013.

[24] While the MEEIA rule definition of avoided cost or avoided utility cost (4 CSR 240-20.093(1)(F) allows for inclusion of probable environmental compliance costs, the Ameren Missouri avoided utility costs for net shared benefits calculation does not include probable environmental costs. However Ameren Missouri does include probable future environmental compliance costs in its assumptions of future market prices.

Table B6. Lost revenue and savings data for Missouri IOUs

	Ameren Missouri	GMO	KCP&L
LRAM $ recovered	$37,148,122	$8,424,395	Programs initiated in 2014; no results reported to date.
Program cost	$34,432,402	$2,674,537	
1-year energy savings	337,368,000 kWh	30,697,000 kWh	

Discussion

Missouri's DSIMs (addressing program costs, throughput disincentive, and shareholder performance incentive) are very new. Nonetheless, their impact has been dramatic. It is clear from discussions with Missouri stakeholders that establishing these mechanisms has enabled and encouraged affected utilities to initiate and fund large portfolios of customer energy efficiency programs.

Ameren Missouri's recent history with energy efficiency program funding illustrates the substantial effect that MEEIA and authorization of DSIMs have had. Prior to MEEIA's passage, Ameren Missouri had energy efficiency programs in place representing total utility investment of about $70 million for the three-year period 2009–2011. During this time, Ameren Missouri received only program cost recovery; there was no lost revenue recovery and no shareholder incentives. Ameren Missouri leadership viewed this business model for energy efficiency as unsustainable. As a result, the utility put the brakes on its programs and reduced its program funding from $30 million in 2011 to a "bridge" of $8 million in 2012. The MEEIA rules had just been approved, and Ameren Missouri sought to retain the basic foundations of its energy efficiency programs in anticipation of getting the regulatory treatment of costs and incentives that would allow it to return to a much higher level of investment. With the commission's approval of its DSIM, Ameren Missouri's investment did indeed jump—up to $35 million in 2013, $45 million in 2014, and as much as $65 million in 2015. Both utility staff and clean energy advocates noted that having all three legs of the stool in place had a major effect on Ameren's decision to invest in energy efficiency.

As noted earlier, MEEIA does not require utilities to fund and provide energy efficiency programs. They are voluntary. Consequently, considering demand-side investments using the same investment criteria as supply and delivery infrastructure, and allowing recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs were critical for the utilities to engage fully and provide energy efficiency programs and services. To date, three of the four regulated electric utilities in Missouri have established energy efficiency programs in response to MEEIA. The remaining utility, Empire Electric, is developing proposals and initiated an MEEIA filing in late 2013.

MECHANISM COSTS

As structured, Missouri's DSIMs provide compensation to utilities for lost revenues associated with energy savings regardless of net system demands. Other states have structured LRAMs based on net system energy sales. This raises the question of whether Missouri's mechanisms are too expensive.

EVALUATION

Because Missouri's LRAMs are determined by deemed values for energy and demand savings along with measure life, the relevant program metric is the number of various measure installations achieved by the different programs. These data are reported by program contractors and staff as part of routine program tracking and are subject to prudence review by commission staff. Divergence from program projections is addressed by periodic true-ups of the DSIM.

PROCESS

Once authorized, the DSIMs are effective for the associated program period. Recovery of costs stemming from the throughput disincentive is achieved through rate riders or trackers for MEEIA programs. Parties noted that learning curve is very steep for utility energy efficiency programs. It is taking time for all involved to work through the processes and issues associated with the development, implementation, and evaluation of programs, including determination of utility incentives.

Looking Forward

The rules established for MEEIA are undergoing a required review in 2015. Missouri's regulations requiring integrated resource planning remain in place; such proceedings occur separately from MEEIA program filings.

Ameren Missouri filed its next three-year MEEIA program plan in December 2014. The existing DSIM is part of this plan. The proposed level of investment in energy efficiency programs is about the same as in the existing three-year MEEIA program plan, but expected savings are about half.

Missouri's DSIMs are too new to allow assessment of their full impact and effectiveness. It is clear that having them in place has been a critical catalyst for Missouri's electric utilities to move ahead with portfolios of customer energy efficiency programs representing significant utility investment. What is not clear yet is whether the costs of providing throughput disincentives are too high.

While more time and analysis will be needed before one can fully assess the effectiveness of Missouri's DSIMs, it already is clear that mechanisms to address the utility business model have been effective in encouraging increased efficiency in a state where no incentives were in place previously.

SOUTH CAROLINA

History

South Carolina does not require or set goals for energy efficiency. Efficiency programs are largely the result of pressure from consumer and advocacy groups. A lost revenue adjustment mechanism was first authorized in South Carolina in 2008. Initially, specific regulatory features of energy efficiency programs were tailored to each utility in the state. Investor-owned utilities approached the South Carolina Public Service Commission with proposals for efficiency programs and mechanisms to recover costs and lost margin. Commission Order No. 2009-373 issued in 2009 stated that Duke Energy Progress (formerly Progress Energy Carolinas) could "recover capital expenditures, the actual costs incurred in

providing demand side management and energy efficiency programs, net lost revenues from these programs, incentives… and defer and amortize all demand side management and efficiency program expenses over a ten year period." The Commission approved a lost revenue recovery mechanism for South Carolina Electric & Gas Company (SCE&G) in 2010 (Docket No. 2009-261-E and Docket 2009-251-E). In 2013, a reestablishment of the recovery mechanism for Duke and SCE&G was ordered.

Other Relevant Regulatory Features

The South Carolina PSC has also approved shared savings incentives for investor-owned utilities. Incentives are detailed further in Nowak et al. (2015). Energy efficiency programs in the state have been influenced by programs run by interconnected utilities in North Carolina, where a combined renewable and energy efficiency portfolio standard is in place. Furthermore, a settlement agreement associated with a merger between Duke Energy Carolinas and Progress Energy Carolinas stipulated annual energy savings targets equivalent to 1% of retail sales over the time period 2014–2018.

LRAM Policy Details

South Carolina's lost revenue adjustment mechanism was established in S.C. Code Ann § 58-37-20 and further described in Docket No. 2008-251-E (Order No. 2009-373). Lost revenues are based on estimated net energy savings multiplied by the retail rate less fuel and variable operating and maintenance costs. Utilities are required to hire third parties to evaluate efficiency programs. Lost revenues are estimated annually and trued up once evaluation reports become available. Lost revenues can be collected for three years after measure installation or the life of the measure, whichever is shorter. The South Carolina Office of Regulatory Staff (ORS) publishes a report in every demand-side management rider recovery docket, which is publicly available.

Under the most recent mechanism approved for one utility, a percentage of *estimated* net lost revenue is approved for recovery. During the first year, the estimate is recovered at 75%, the next year at 80%, and in subsequent years 90% and 100%. This stepped recovery is meant to allow estimates to be recalculated as data become available and to avoid unnecessary true-ups. Other utilities have adjusted their recovery to control spikes in rates when necessary and possible to do so.

Outcomes

Regulatory staff and clean energy advocates were united in their feeling that the three-legged-stool approach has been critical in encouraging IOUs to invest in energy efficiency in South Carolina. Over several years, the state's Office of Regulatory Staff (ORS) has worked with utilities to refine their approach to recovery of lost margins. Generally, there is broad support for the LRAM within the state, although some stakeholders noted that South Carolina is still achieving relatively low levels of savings when compared with other states.

ENERGY SAVINGS

South Carolina's energy savings have steadily climbed since the introduction of the LRAM and performance incentives. Figure B6 shows statewide electricity savings and the national median.

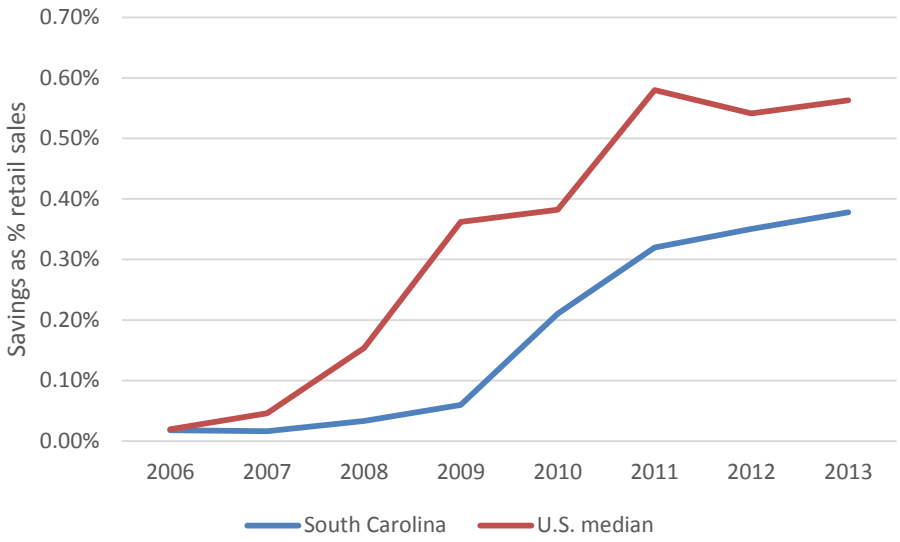

Figure B6. Net incremental savings as a percentage of retail sales for South Carolina compared with US median electricity savings. *Source:* ACEEE *State Energy Efficiency Scorecard* 2007–2014.

Though South Carolina remains below the national median, stakeholders noted that utilities have performed well in recent years relative to others in the region. However efficiency advocates also noted that savings have varied from year to year for each utility, with good years and bad years.

Regulatory staff also noted that policy mechanisms have changed several times in recent years. Thus, making assertions about the effect of a single mechanism *type* is nearly impossible.

FINANCIAL OUTCOMES

The most recent estimates of lost revenue earnings from efficiency programs are presented in table B7. South Carolina utilities are able to recover lost revenues from each program year for three years. Approved recovery for the relevant program year over the three-year period is also shown.

Table B7. Lost revenue recovered in recent years

Utility	LRAM $ for program year	Cost of energy efficiency programs	Total energy savings achieved	LRAM $ for approved 3-year timeframe
		2013		
SCE&G	$4,215,715	$15,890,902	57,333,000	$20,568,683
Duke Energy Progress	$3,527,268	$6,580,487	35,580,042	$11,294,650
Duke Energy Carolinas	$4,034,970	$17,133,555	120,352,634	$11,332,427

Utility	LRAM $ for program year	Cost of energy efficiency programs	Total energy savings achieved	LRAM $ for approved 3-year timeframe
		2014		
SCE&G	$6,432,465	$17,106,108	101,404,418	$27,001,148
Duke Energy Progress	$4,673,374	$6,452,562	23,899,720	$10,718,207
Duke Energy Carolinas	$3,985,437	$17,928,851	104,117,911	$10,116,293

Source: South Carolina Office of Regulatory Staff.

Discussion

After several years of LRAM in South Carolina, mechanisms have been adjusted to promote consistency between utilities and to mitigate potential effects on consumers. Overall, stakeholders expressed that there was limited opposition to South Carolina's LRAM and other utility incentives. All parties believed these regulatory mechanisms were necessary to encourage efficiency, although some said they would like to see more aggressive efforts to achieve energy savings from IOUs.

PROTECTING CONSUMERS

South Carolina's flexible approach to cost recovery is meant to protect consumers from rate shocks. Regulatory staff noted that estimates of lost revenues can be dramatically different from actual lost revenues, and a flexible approach to collection of lost margin minimizes large adjustments that would show up on customers' bills. Utilities in the state have also sought other ways of minimizing bill impacts. For example, SCE&G is investing heavily in nuclear power plants, leading to rising rates for customers. In order to shelter customers from the impact of an additional efficiency rider, the utility has deferred the collection of program costs. It is unclear what the future implication of this deferral will be for consumers.

TRANSPARENCY

Stakeholders emphasized the importance of transparency in South Carolina's LRAM. While clean energy advocates felt that data are generally available, other parties believe transparency could be improved. For example, utilities could submit clearer evidence of what savings were achieved over specific time periods. Since not all measures are subject to the three-year EM&V framework, it can be difficult to parse out specific savings and lost revenues associated with a particular program year. In an effort to make regulation more straightforward and to better align EM&V processes with ratemaking processes, the commission recently approved a new schedule for efficiency program years that aligns with the calendar year.

Looking Forward

South Carolina shows no indication that it will move away from its current approach to energy efficiency regulation. Parties noted that decoupling was largely off the table, as were energy savings targets, and the LRAM has almost no opposition. With new LRAM models

approved in recent years, all stakeholders expressed hope that these will prove to be simple and transparent.

Appendix C. State Contact Questionnaire

Regulatory Structure Questions

Please briefly describe the lost revenue adjustment mechanism (LRAM) or lost contribution to fixed cost (LCFC) mechanism in your state.

1. When was it first authorized? When was the most recent version established?
2. To which utilities does it apply?
3. How are lost revenues estimated? (Please describe the basic calculation.)
4. How are the efficiency program savings that are used to determine lost revenues measured and verified? By whom?
5. Are the savings used in determination of lost revenues net or gross?
6. How often are lost revenues recovered (i.e., annually, biannually)?
7. Are there any threshold requirements for a utility to qualify to receive lost revenues? If so, please describe.
8. Is there a limit or ceiling for lost revenue recovery? If so, what is it?
9. For how long after a particular program year does lost revenue recovery for that year's programs continue?

Please provide the following information for up to 3 utilities covered by LRAM in your state. Please reference each of the two most recent program years for which data is available. Indicate program years and fill in information for each year in the table below.

	Utility 1: _____	Utility 2: _____	Utility 3:_____
Program Year _____			
Lost Revenue Dollars Recovered ($)*			
Cost of energy efficiency programs to which LRAM was applied ($)			
Total (1-year annual) energy savings achieved by the programs under LRAM (Please indicate kWh or therms)			
Program Year _____			
Lost Revenue Dollars Recovered ($)*			

Cost of energy efficiency programs to which LRAM was applied ($)			
Total (1-year annual) energy savings achieved by the programs under LRAM (Please indicate kWh or therms)			

*Note: This refers to the total net lost revenues (NLR) the program year generates over the time frame NLR is approved to be collected.

Please provide a citation or reference to the official documentation (e.g., statue, regulatory order, etc.) where the lost revenue recovery mechanism is established or described.

Is there a report or other document describing the mechanism and the results of how it has worked in practice in your state, and/or provides data on the actual award for the last two program years? If so, please provide link, contact person, or reference where we may obtain a copy.

General Questions

1. Are there any suggestions you would make to another state who was thinking of adopting an LRAM such as the mechanism used in your state?

2. Please provide any additional insights or important information about regulatory adjustments to the utility business model in your state that we have not covered above.