STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF INDIANA MICHIGAN POWER COMPANY REQUESTING THE INDIANA UTILITY REGULATORY COMMISSION TO APPROVE CERTAIN DEMAND SIDE MANAGEMENT PROGRAMS AND GRANT COMPANY AUTHORITY TO RECOVER COSTS, INCLUDING PROGRAM COSTS, INCENTIVES AND LOST MARGINS, ASSOCIATED WITH THE DEMAND SIDE MANAGEMENT PROGRAMS PURSUANT TO SENATE ENROLLED ACT 412 AND 170 IAC 4-8-1 ET. SEQ. VIA THE COMPANY'S DEMAND SIDE MANAGEMENT ADJUSTMENT	)))))) CAUSE NO. 43827 DSM 5))))))))

IURC
INTERVENOR'S - CAC
EXHIBIT NO. 1, Vol. 1
2-10-16   A
DATE   REPORTER

DIRECT TESTIMONY AND EXHIBITS OF NATALIE MIMS ON BEHALF OF CITIZENS ACTION COALITION OF INDIANA, INC.

**Direct Testimony of Natalie Mims
On Behalf of Citizens Action Coalition of Indiana, Inc.
Cause No. 43827 DSM 5
January 13, 2016**

1   **I.**   **INTRODUCTION**

2   **Q.**   **Please state your name and business address.**

3   **A.**   My name is Natalie Mims of Mims Consulting, LLC, and my business address is

4   1035 Santa Barbara Street, Suite 9, Santa Barbara, California 93101.

5   **Q.**   **Please describe your professional background and experience.**

6   **A.**   I have testified as an expert before the Florida, Georgia, Hawaii, Indiana, North

7   Carolina, and South Carolina Public Service Commissions regarding Investor

8   Owned Utility energy efficiency program plans, cost recovery, performance

9   incentives, lost revenue adjustment mechanisms and evaluation, measurement and

10   verification reports. My resume is attached as Exhibit NM-1.

11   **Q.**   **Have you testified previously before the Indiana Utility Regulatory**

12   **Commission ("Commission" or "IURC")?**

13   **A.**   Yes. I filed written testimony in 43955 DSM 3 (Duke 2016-2018 EE Plan) on

14   September 3, 2015, in 44634 (NIPSCO 2016-2018 EE Plan) on September 4,

15   2015 and in 44645 (Vectren 2016-2017 EE Plan) on October 7, 2015.

16   **Q.**   **On whose behalf are you testifying?**

17   **A.**   I am testifying on behalf of Citizens Actions Coalition of Indiana, Inc. ("CAC").

18   **Q.**   **What is the purpose of your testimony?**

19   **A.**   The purpose of my testimony is to provide my expert opinion as to whether or not

20   the 2016 energy efficiency plan of Indiana Michigan Power Company ("I&M" or

1   "the Company") is (1) in the public interest as an Alternative Regulatory Plan

2   and/or (2) reasonable as an energy efficiency plan, assuming I&M's references to

3   Ind. Code § 8-1-8.5-9 are meant to apply as a back-up in case the Commission

4   rejects this plan as an Alternative Regulatory Plan.

5   I&M petitions the Commission for approval of its 2016 DSM/EE

6   Programs as an Alternative Regulatory Plan ("ARP") pursuant to Ind. Code § 8-1-

7   2.5-6.[1] In determining whether an ARP is in the public interest, the Commission

8   must consider:

9   (1) Whether technological or operating conditions, competitive forces, or
10   the extent of regulation by other state or federal regulatory bodies render
11   the exercise, in whole or in part, of jurisdiction by the commission
12   unnecessary or wasteful.
13   (2) Whether the commission's declining to exercise, in whole or in part, its
14   jurisdiction will be beneficial for the energy utility, the energy utility's
15   customers, or the state.
16   (3) Whether the commission's declining to exercise, in whole or in part, its
17   jurisdiction will promote energy utility efficiency.
18   (4) Whether the exercise of commission jurisdiction inhibits an energy
19   utility from competing with other providers of functionally similar energy
20   services or equipment.
21
22   Ind. Code § 8-1-2.5-5.
23
24   Although I am not an attorney, CAC's counsel has informed me that while

25   the Commission is not mandated to factor in the substance and declaration of Ind.

26   Code § 8-1-2.5-1[2] when making decisions on ARPs, it typically does so. Ind.

27   Code § 8-1-2.5-1 provides the following declaration from the Indiana General

28   Assembly:

---

[1] I&M's Verified Petition and Request for Administrative Notice, pages 1 and 4 (Sept.
11, 2015).
[2] See, e.g., IURC Cause No. 44478, page 16 (Feb. 11, 2015).

1	(1) That the provision of safe, adequate, efficient, and economical retail
2	energy services is a continuing goal of the commission in the exercise of
3	its jurisdiction.
4	(2) That competition is increasing in the provision of energy services in
5	Indiana and the United States.
6	(3) That traditional commission regulatory policies and practices, and
7	certain existing statutes are not adequately designed to deal with an
8	increasingly competitive environment for energy services and that
9	alternatives to traditional regulatory policies and practices may be less
10	costly.
11	(4) That an environment in which Indiana consumers will have available
12	state-of-the-art energy services at economical and reasonable costs will be
13	furthered by flexibility in the regulation of energy services.
14	(5) That flexibility in the regulation of energy services providers is
15	essential to the well-being of the state, its economy, and its citizens.
16	(6) That the public interest requires the commission to be authorized to
17	issue orders and to formulate and adopt rules and policies that will permit
18	the commission in the exercise of its expertise to flexibly regulate and
19	control the provision of energy services to the public in an increasingly
20	competitive environment, giving due regard to the interests of consumers
21	and the public, and to the continued availability of safe, adequate,
22	efficient, and economical energy service.
23	
24	Ind. Code § 8-1-2.5-6(e) allows the Commission to approve, reject, or modify an
25	energy utility's proposed Alternative Regulatory Plan if the Commission finds
26	such action is consistent with the public interest after weighing the evidence
27	presented.
28	I&M also references Indiana Senate Enrolled Act 340 (2014) codified
29	under Ind. Code § 8-1-8.5-9,[3] but it appears that I&M is not asking for relief
30	under this statute besides referencing its compliance with allowing industrial
31	customers the opportunity to opt out of utility energy efficiency programs.

---

[3] I&M's Verified Petition, pp. 3-4.

4

1   Finally, I&M appears to attempt to also comply with certain elements in

2   Indiana Senate Enrolled Act 412 (2015) codified under Ind. Code § 8-1-8.5-10.[4]

3   Ind. Code § 8-1-8.5-10(f) says: "plan" refers to the goals, programs, program

4   budgets, program costs, and procedures submitted by an electricity supplier to the

5   commission under subsection (h). I&M's plan is not compliant with Ind. Code §

6   8-1-8.5-10(h) or reasonable under Ind. Code § 8-1-8.5-10(j) for many reasons.

7   Overall, I&M's plan is (1) not in the public interest as an Alternative

8   Regulatory Plan ("ARP"); (2) not reasonable under Ind. Code § 8-1-8.5-9; and (3)

9   not reasonable under Ind. Code § 8-1-8.5-10. I&M's plan should be rejected until

10   all the recommendations that I have set forth below are incorporated into I&M's

11   plan. While I&M works to incorporate my recommendations into its plan, I

12   recommend that the Company continue to offer its DSM programs as it has under

13   its 2015 plan for purposes of consistency, marketplace certainty, and for the

14   benefit of I&M's customers.[5]

15 **Q.   Please summarize your conclusions and recommendations.**

16 **A.**   In order to rectify these issues and present a plan that the Commission could and

17   should approve, I&M would have to:

---

[4] *See, e.g.,* I&M Witness Walter Testimony, pp. 3, lines 17-20, which references energy
efficiency goals, budget, and plans for stakeholder input—all explicit requirement of Ind.
Code § 8-1-8.5-10.
[5] I am aware that the Commission granted I&M interim authority on November 18, 2015,
to continue offering its current DSM programs and recovering associated costs as
approved in the Commission's December 3, 2014 Order in Cause No. 44486 through
April 30, 2016.

1. Present a DSM plan that is consistent with an IRP that reasonably balances energy resources through comparable consideration of both supply and demand-side resources.

2. Pursue all reasonably achievable savings by increasing the goals for those programs unaffected by opt-out customers to levels consistent with Action Plan, and spending entire DSM budget.

3. Modify new construction and low income programs; re-evaluate if the Neighborhood Energy and Moderate Income are appropriate programs to offer, and provide an explanation if the Company finds they are not appropriate; offer a program for multifamily homes, new manufactured homes, direct install for schools, and non-residential self-direct programs; and modify its opt-out letter to include details on the benefits of EE.

4. Require I&M's Oversight Board guidance to return to the pre-Settlement oversight requirements.

5. Demonstrate that it is experiencing lost revenues and then limit lost revenue recovery to 36 months or the life of the measure, whichever is shorter.

6. Include a performance incentive that is based on multiple performance metrics and subject to financial cap. A performance incentive should only be proposed if lost revenue recovery is limited to 36 months or the life of the measure, whichever is shorter.

7. File clear EM&V in all future DSM proceedings.

1   **II.**   <u>**I&M'S PLAN IS NOT IN THE PUBLIC INTEREST, AND THE**</u>

2   <u>**COMMISSION SHOULD NOT DECLINE TO EXERCISE ITS**</u>

3   <u>**JURISDICTION.**</u>

4   **Q.**   **Please describe Ind. Code § 8-1-2.5-5 and how, in your opinion, it applies to**

5   **I&M's plan.**

6   **A.**   An Alternative Regulatory Plan ("ARP") pursuant to Ind. Code § 8-1-2.5-6 uses

7   factors from Ind. Code § 8-1-2.5-5 to help the Commission determine if the plan

8   is in the public interest. I am not an attorney, but it does not seem logical to use

9   Ind. Code § 8-1-2.5-5 as the governing statute, considering the recently enacted

10   Ind. Code §§ 8-1-8.5-9 (2014) and 8-1-8.5-10 (2015) that directly relate to electric

11   utility-sponsored demand side management. In fact, it seems wasteful and a poor

12   use of stakeholder resources. Ind. Code § 8-1-2.5-5 focuses on whether the

13   Commission declining jurisdiction will serve the public interest. My expert

14   opinion is that the public interest will not be served by the Commission declining

15   jurisdiction, rather the public interest will be harmed if the Commission does not

16   step in to order better program administration from I&M. This is especially so

17   considering the fact that I&M is required to file a plan under Ind. Code § 8-1-8.5-

18   10 by 2017.

19   Ind. Code § 8-1-2.5-5(b)(1)-(4) lists four different matters for the

20   Commission to consider when deciding whether the public interest will be served

21   by the Commission declining its jurisdiction. The first is "whether technical or

22   operating conditions, competitive forces, or the extent of regulation by other state

1   or federal regulatory bodies render the exercise, in whole or in part, of jurisdiction

2   by the commission unnecessary or wasteful." Ind. Code § 8-1-2.5-5(b)(1).

3   Q.   **Do you believe that technical or operating conditions, competitive forces, or**

4   **the extent of regulation by other state or federal regulatory bodies render the**

5   **exercise, in whole or in part, of Commission jurisdiction unnecessary or**

6   **wasteful?**

7   A.   No. I am not an attorney, but in my expert opinion, the Commission's jurisdiction

8   is necessary and prudent in this instance. The Commission's expertise in this

9   subject area and the recent statutes seem to indicate the legislature's preference

10   for the Commission to handle such matters. It appears that because I&M's plan

11   does not meet the threshold of Ind. Code § 8-1-8.5-9 or §8-1-8.5-10, I&M is using

12   this ARP statute as a way around it. The Commission should not accept I&M's

13   invitation to circumvent the applicable statutes.

14 Q.   **Do you believe that I&M, I&M's customers, or the State of Indiana will**

15   **benefit by the Commission declining to exercise its jurisdiction, in whole or**

16   **in part, as contemplated in Ind. Code § 8-1-2.5-5(b)(2)?**

17 A.   No. If anything, I&M should be working toward compliance with Ind. Code § 8-

18   1-8.5-10, which is squarely within the Commission's jurisdiction. Any delay

19   toward achieving compliance with the new legislation is harmful to I&M's

20   customers and the State, in particular, especially with the recently enacted federal

21   Clean Power Plan. Any savings left on the table will make it harder for the State

22   of Indiana to comply with the Clean Power Plan.

1   **Q.**   **Do you believe that the Commission declining to exercise its jurisdiction, in**

2   **whole or in part, will promote energy utility efficiency, as contemplated in**

3   **Ind. Code § 8-1-2.5-5(b)(3)?**

4   **A.**   No. If the amount of energy efficiency in I&M's plan was higher than its Market

5   Potential Study or IRP, then perhaps this would make more sense, but as I will

6   describe below, I&M's energy efficiency goal is woefully inadequate.

7   **Q.**   **Do you believe that the exercise of Commission jurisdiction inhibits I&M**

8   **from competing with other providers of functionally similar services or**

9   **equipment?**

10   **A.**   No. This is especially the case with I&M as it has brought in house a significant

11   amount of its EE/DSM services, much to the detriment of ratepayers, in my expert

12   opinion.

13   **Q.**   **If Ind. Code § 8-1-2.5-5 should not apply, please describe Ind. Code § 8-1-8.5-**

14   **9 and how, in your opinion, it would be applied to I&M's plan.**

15   **A.**   Ind. Code § 8-1-8.5-9(c) defines "energy efficiency program" as a program that

16   is: (1) sponsored by an electricity supplier or a third party administrator; and (2)

17   designed to implement energy efficiency improvements (as defined in 170 IAC 4-

18   8-1 (j)) for customers. Energy efficiency improvements in 170 IAC 4-8-1-(j)

19   means reduced energy use for a comparable level of energy service.

20   Ind. Code § 8-1-8.5-9(m) states that an electricity supplier may offer a cost

21   effective portfolio of energy efficiency programs to customers, and the

22   Commission must determine that the portfolio included in the proposed energy

23   efficiency program is reasonable and cost effective. If the Commission makes

1   that decision, the electricity supplier *may* recover program costs, lost revenues,

2   and incentives approved by the Commission.

3   I&M's plan is neither reasonable nor cost effective, especially when

4   considering the amount of savings left on the table and I&M's proposal for

5   lifetime recovery of lost revenues.

6   **Q.   If Ind. Code § 8-1-2.5-5 should not apply, please describe Ind. Code § 8-1-8.5-**

7   **10 and how, in your opinion, it would be applied to I&M's plan.**

8   **A.**   Section (h) of Ind. Code § 8-1-8.5-10 states that a plan shall include (1) energy

9   efficiency goals, (2) energy efficiency programs through which the energy

10   efficiency goals will be achieved, (3) program budgets and costs, and (4)

11   independent evaluation measurement and verification ("EM&V"). Section (c)

12   defines "energy efficiency goals" as all energy efficiency produced by cost

13   effective plans that are (1) reasonably achievable; (2) consistent with an

14   electricity supplier's integrated resource plan; and (3) designed to achieve an

15   optimal balance of energy resources in an electricity supplier's service territory.

16   I am not an attorney, but based on my review, I&M's plan does not meet

17   the definition of an energy efficiency goal (Section (h)) because it does not meet

18   Section (c) (1) - (3) requirements of Ind. Code § 8-1-8.5-10.

19 **Q.   What role did I&M's IRP play in establishing its energy efficiency goals for**

20 **2016?**

21 **A.**   I&M filed its petition in this case on September 11, 2015. At that time, the 2013

22   IRP was the most recently completed and the 2015 IRP was under development,

23   but was filed less than two months later on November 2, 2015. The 2013 IRP

1   provided no meaningful assessment of energy efficiency compared to other

2   potential resources. As IURC Electricity Director Brad Borum's final report on

3   I&M's 2013 IRP states, "I&M did not allow EE to compete with supply-side

4   resources in an optimization process over the full planning horizon."[6] Further,

5   "[it] is clear that I&M assumed a specified level of EE in the resource plan and

6   that this impact was based on management judgment through 2019."[7]

7   Nor can the 2015 IRP reasonably have influenced the level of proposed

8   savings in this DSM plan. "Incremental" energy efficiency was only made

9   available to the Plexos optimization model starting in 2018.[8]

10   For these reasons, I&M cannot claim to satisfy Section (c) in Ind. Code §

11   8-1-8.5-10 or to be achieving the public interest under Ind. Code § 8-1-2.5-5(b).

12   I&M also cannot it claim to be reasonable and cost-effective under Ind. Code § 8-

13   1-8.5-9, because a reasonable comparison of supply versus demand side measures

14   is necessary to demonstrate cost-effectiveness.

15   **Q.   What are the energy efficiency programs I&M is proposing in this filing?**

16   A.   I&M is proposing to offer ten residential programs and five non-residential

17   programs (including two pilots) as shown in Table 1 below.[9]

---

[6] Director's Final Report at page 5 (CAC Administrative Notice Exhibit 1).
[7] *Id.* at 6.
[8] Indiana Michigan Power Integrated Resource Planning Report to the Indiana Utility Regulatory Commission, November 2, 2015 (CAC Administrative Notice Exhibit 2), page 91.
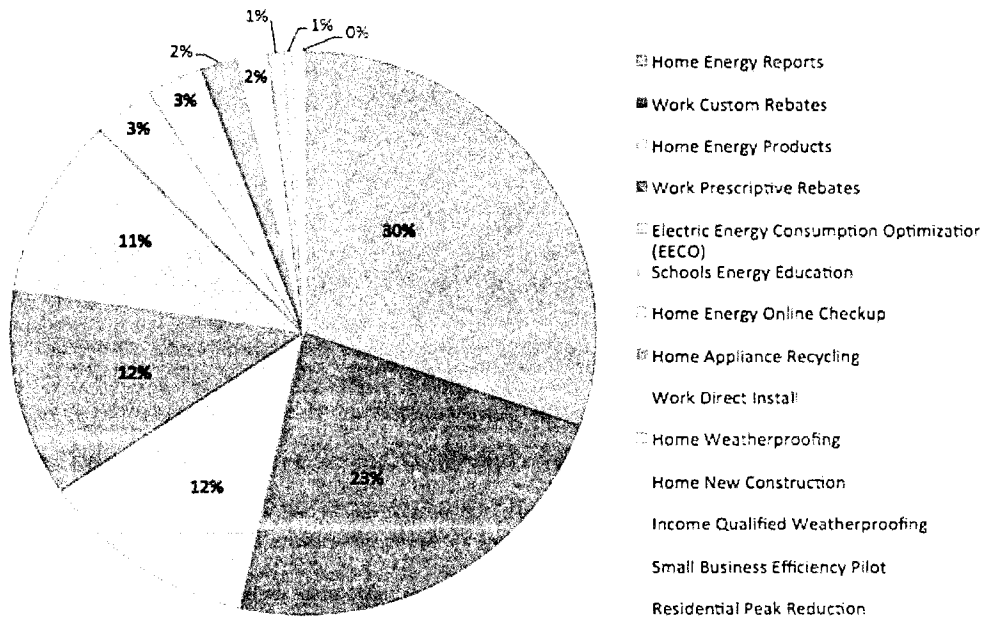[9] Petitioner's Verified Petition, page 4, paragraph 9.

1

Table 1. I&M Proposed 2016 DSM Programs

	Residential Programs			Non-Residential Programs
1.	Home Energy Products		1.	Work Prescriptive Rebates
2.	Income Qualified Weatherproofing		2.	Work Custom Rebates
3.	Schools Energy Education		3.	Work Direct Install
4.	Home Appliance Recycling		4.	Electric Energy Consumption Optimization
5.	Home New Construction			
6.	Home Weatherproofing			
7.	Home Online Energy Checkup			
8.	Home Energy Reports		5.	Small Business Efficiency Pilot
9.	Residential Peak Reduction			
10.	Home Comfort & Efficiency Pilot			

Chart 1. I&M Proposed 2016 DSM/EE Plan Energy Savings

Home Energy Reports

Work Custom Rebates

Home Energy Products

Work Prescriptive Rebates

Electric Energy Consumption Optimization (EECO)

Schools Energy Education

Home Energy Online Checkup

Home Appliance Recycling

Work Direct Install

Home Weatherproofing

Home New Construction

Income Qualified Weatherproofing

Small Business Efficiency Pilot

Residential Peak Reduction

1   Q.   **How much energy does I&M propose saving in its 2016 Plan, and how does**

2   **that compare to the former Energy Efficiency Resource Standard ("EERS")**

3   **established by the IURC's December 9, 2009 Order?**

4   A.   I&M proposes saving 141 gigawatt-hours in 2016, as shown in Table 2. I&M's

5   proposed goal is lower than both the I&M Updated Action Plan for Electric

6   Demand Side Management (DSM) Programs: Final Report[10] ("Action Plan") and

7   the former EERS. This is not reasonable and not in the public interest to leave

8   cost effective energy efficiency on the table. I&M's portfolio is dominated by its

9   Home Energy Report and Work Custom Rebates programs, as shown above in

10   Chart 1, which is becoming a concerning trend as shown in Chart 2, below.

11

12   **Table 2. I&M Efficiency Goals and Former EERS**

	GWh	% of sales[11]
2014 Savings	127	0.69%
2015 Goal	155	0.85%
2015 Year To Date[12]	69	0.38%
2016 Goal[13]	141	0.77%
2016 Action Plan[14]	236	1.3%
2016 Former State Target[15]	225	1.2%

[10] I&M Discovery Request Response to CAC Set 1, Q6, Updated Action Plan (Exhibit NM-2).

[11] All savings are calculated as a percent of 2014 retail sales, including all sales to industrial customers as reported on I&M EIA Form 861.

[12] Based on I&M December Oversight Board meeting, which provided savings through October 2015. I&M DSM/EE Program Scorecard October 2015 (Exhibit NM-3).

[13] I&M Witness Walter's Testimony, Attachment JCW-2.

[14] I&M Discovery Request Response to CAC Set 1, Q6, Updated Action Plan (Exhibit NM-2).

[15] Cause No 42693-S1, Submission of Redacted MCR Report, Figure 3, June 27, 2013, available at:
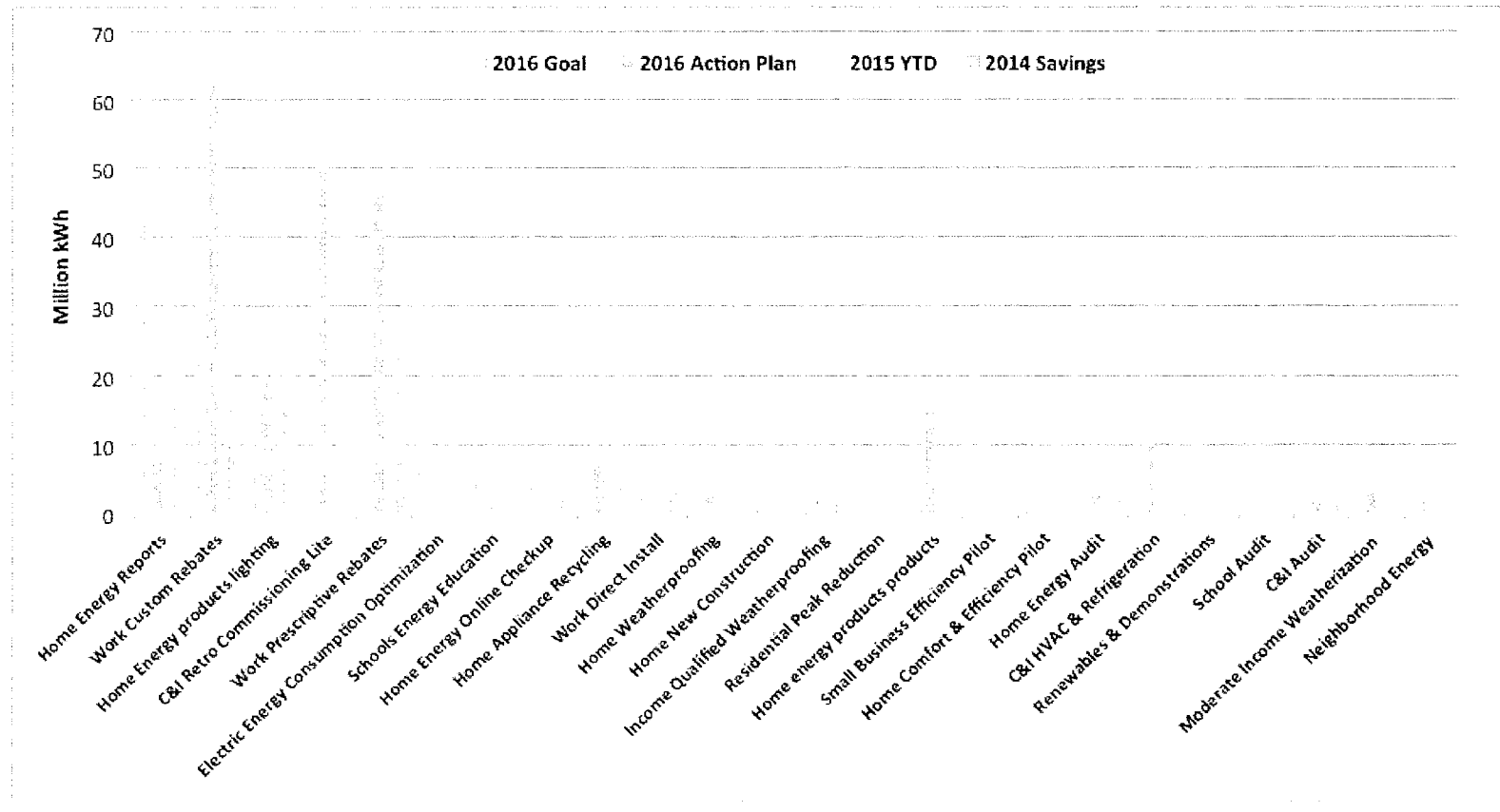
1   **Q.**   **How does I&M's 2016 goal compare to its 2015 goal?**

2   **A.**   I&M's 2016 goal is lower than the 2015 goal. I&M has eliminated six programs

3   from its portfolio since 2014, and is concentrating more and more of its savings

4   into fewer programs, such as the Home Energy Report program and Work

5   Custom Rebates program. This is concerning because, for example, I&M is

6   proposing to halve the energy efficiency goal for its residential low income

7   program, and double the Home Energy Reports program from 2015-2016. I will

8   discuss this in more detail below. Shifting the majority of the portfolio savings

9   into a few programs may not provide robust energy efficiency opportunities to all

10   of I&M's customers, and may create a very cost-effective but unreasonably

11   unbalanced portfolio that is not in the public's interest.

---

https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.a
spx?DocID=0900b631801a1dfc (CAC Administrative Notice Exhibit 3).

Chart 2. I&M Program Comparison 2014-2016[16]

Chart legend: 2016 Goal | 2016 Action Plan | 2015 YTD | 2014 Savings

Y-axis: Million kWh (0 to 70)

X-axis categories: Home Energy Reports, Work Custom Rebates, Home Energy products lighting, C&I Retro Commissioning Lite, Work Prescriptive Rebates, Electric Energy Consumption Optimization, Schools Energy Education, Home Energy Online Checkup, Home Appliance Recycling, Work Direct Install, Home Weatherproofing, Home New Construction, Income Qualified Weatherproofing, Residential Peak Reduction, Home energy products products, Small Business Efficiency Pilot, Home Comfort & Efficiency Pilot, Home Energy Audit, C&I HVAC & Refrigeration, Renewables & Demonstrations, School Audit, C&I Audit, Moderate Income Weatherization, Neighborhood Energy

1

---

[16] I&M Data Request Response to CAC 4-01. I and M DSM EE Program Score Card – EMV December 3.16.15.xlsx (Exhibit NM-4); I and M DSM EE Program Scorecard October 12.08.15.xlsx (Exhibit NM-3); I&M Data Request Response to CAC 1-06 Final Report – Updated Action Plan.pdf (Exhibit NM-2); I&M Witness Walters Testimony, Attachment JCW-2. Please note that 2015 year-to-date (YTD) savings are savings up to October 2016, the latest data available.

Table 3. I&M EE Program Impacts and Savings as a Percent of Sales[17,18]

	2014 Savings		2015 YTD		2016 Goal		2016 Action Plan	
	GWh	% Portfolio Savings	GWh	% Portfolio Savings	GWh	% Portfolio Savings	GWh	% Portfolio Savings
Home Energy Reports	24	19%	22	31%	43	30%	8	3%
Work Custom Rebates	15	12%	9	13%	33	23%	62	26%
Home Energy Products Lighting[19]	16	12%	6	8%	16	11%	20	9%
Home Energy Products Products	1	<1%	<1	1%	1	1%	15	6%
Work Prescriptive Rebates	24	19%	12	17%	17	12%	47	20%
EECO	8	6%	6	9%	15	10%	0	0%
Schools Energy Education	2	1%	5	7%	5	3%	2	1%
Home Energy Online Checkup	3	2%	4	6%	4	3%	<1	<1%
Home Appliance Recycling	4	3%	3	4%	3	2%	7	3%
Work Direct Install	3	2%	1	2%	2	2%	Not offered	
Home Weatherproofing	1	1%	<1	<1%	1	1%	3	1%
Home New Construction	<1	<1%	<1	1%	1	<1%	<1	<1%
Income Qualified Weatherproofing	2	1%	<1	<1%	1	<1%	2	1%
Res. Peak Reduction	0	0%	<1	<1%	<1	<1%	0	0%
Home Comfort and Efficiency Pilot	Not offered		Not offered		<1	<1%	Not offered	
Small Business Efficiency Pilot					<1	<1%		
Res. Neighborhoods					Not offered		2	1%
Moderate Income Weatherization							4	2%
Home Energy Audit	2	2%					<1	1%
C&I Retro Commissioning Lite	21	16%					50	21%
C&I HVAC Refrigeration	<1	<1%					10	4%
Renewables & Demonstrations	<1	<1%					<1	<1%
School Audit	1	<1%					<1	<1%
C&I Audit	1	1%					2	1%

---

[17] I&M Data Request Response to CAC 1-04, I and M DSM EE Program Score Card – EMV December 3.16.15.xlsx (Exhibit NM-4); I and M DSM EE Program Scorecard October 12.08.15.xlsx (Exhibit NM-3); I&M Data Request Response to CAC 1-06 Final Report – Updated Action Plan.pdf (Exhibit NM-2); I&M Witness Walter Testimony, Attachment JCW-2.

[18] Programs that achieve less than one GWh of savings are shown as <1 in the table.

[19] Residential lighting is a component of home energy products program. *See* I&M Witness Testimony, Attachment JCW-3 Program Tables.

C&I Peak Reduction	<1	<1%					<1	<1%
Total	127	100%	69	100%	141	100%	237	100%

1   **Q.   How much peak demand reduction does I&M propose in its 2016 Plan?**

2   **A.**   I&M proposes about 31MW in peak reduction in 2016 for its total portfolio with

3   5.6MW coming from in its Residential Peak Reduction Program.[20] Interestingly,

4   this program does not pass the Ratepayer Impact Measure (RIM) Test. This is

5   unusual for a demand response program as DR programs typically save capacity

6   without saving much energy, which can create high amounts of lost revenues

7   (costs in the RIM calculation). In a typical DR program, the RIM test is above one

8   because there are relatively few lost revenues, yet this is not the case for I&M's

9   demand response programs, including the Residential Peak Reduction Program.

10   The program receives little lost revenues as it does not save much energy – in

11   2016, I&M estimates that the program will create $2,253 of net lost revenues

12   (using the half year convention). There is not a discussion in the application about

13   why this program does not pass any of the cost-effectiveness tests, nor is there an

14   explanation as to what costs and benefits are used to calculate the benefit-cost

15   ratios (although in I&M's 2013 Action Plan which is Exhibit NM-2, the program

16   was expected to have a TRC of 1.5). Even with this program, the portfolio

17   remains cost-effective; however, it would be beneficial if I&M provided more

18   detail as to why this program is not cost-effective.

19   Another observation is that I&M's data is ambiguous about if the

20   Residential Peak Reduction Program has energy savings. In the Action Plan

21   which is Exhibit NM-2, there are no energy savings associated with the

---

[20] I&M Witness Walter Testimony, Attachment JCW-2.

1   Residential Peak Reduction Program as shown in Table 3 above. In response to a

2   CAC data request, I&M indicated that there were energy savings in 2010

3   associated with this program, but not in any other year.[21] However, in the 2014-

4   2015 Oversight Board information, and in this application, I&M attributed 30-60

5   MWh[22] of annual energy savings to this program.

6 **Q.   What are the new energy efficiency programs I&M is proposing in this**

7 **filing?**

8 A.   I&M is proposing two pilot programs, the Home Comfort & Efficiency Pilot and

9   the Small Business Efficiency Pilot. The goal of the Home Comfort & Efficiency

10   Pilot is to evaluate and verify the cost and energy savings associated with

11   residential HVAC zone control through devices, thermostats, or other technology

12   such as mini split ductless heat pumps. The goal of the Small Business Efficiency

13   Pilot is to engage smaller business customers and encourage their participation in

14   the Work Direct Install Program.

15   Currently neither of these pilot programs are cost-effective under the TRC

16   or UCT, but the overall portfolio remains cost-effective even with the inclusion of

17   these programs. I applaud I&M for exploring additional program offerings, and

18   encourage them to strive to make the programs cost-effective as they gain

19   experience with program implementation.

---

[21] I&M Discovery Request Response to CAC 5-02, DSM Historic Performance in
Forecast.xls (Exhibit NM-5).
[22] Because these savings are less than 1 GWh, the range of 30-60 does not show up in
Table 3.

1   Q.   **Are there additional opportunities for energy efficiency beyond what the**

2   **Company is proposing here?**

3   A.   Yes, I&M could save much more energy than it projects, which makes I&M's

4   plan unreasonable and not in the public interest for several reasons. First, I&M's

5   Action Plan (Exhibit NM-2) identified that the Company could, in 2016 alone,

6   achieve more than 1.5 times as much energy efficiency, or 95 GWh more than

7   what it is proposing here.[23] Second, I&M has opportunities to modify its existing

8   programs to achieve greater savings. Third, there are new programs I&M can

9   offer to reach markets that it is not currently serving.

10 Q.   **Are there opportunities for additional savings within the existing efficiency**

11   **budget?**

12 A.   Yes. It appears that I&M could simply spend its entire planned budget and

13   achieve more efficiency. As of December 2014, I&M has under recovered almost

14       $17M. While this may appear to be beneficial to consumers, under investing in

15   the most cost-effective resources available to the utility does not help customers,

16   it hurts them. Concurrently, I&M barely achieved is 2013 energy efficiency goals,

17   did not achieve its 2014 goals, and does not appear to be on track to achieve its

18   2015 goals, shown in Table 4 below.

---

[23] I&M Discovery Request Response to CAC 1-06, Updated Action Plan, Tables 7, 10,
13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50, 53, 56, 59, 62, 65, and 68 (Exhibit NM-
2). Savings are not listed as net or gross.

1   Table 4. I&M Energy Efficiency Performance 2012-2015

	% to Goal of Gross Energy Impacts
2012	62%
2013	101%
2014	80%
2015 YTD	44%

2   This under recovery and under performance begs the question as to why

3   I&M did not reallocate funding to successful programs in underperforming years,

4   or try new program delivery and implementation options to achieve its efficiency

5   goals. As I discuss more below, there are many opportunities for I&M to use this

6   funding on cost-effective energy efficiency programs.

7   Q.   **Are the efficiency impacts identified in I&M's Action Plan still valid given**

8   **the change in program administration resulting from Senate Enrolled Act**

9   **340 and Senate Enrolled Act 412?**

10   A.   Yes. While the 2016 residential savings in the Action Plan (Exhibit NM-2) are

11   approximately the same as what I&M is proposing in this application, the

12   proposed savings, as mentioned above, are concentrated in just a few residential

13   programs. Notably, the Home Energy Reports Program will comprise 57% of the

14   residential savings for 2016, and the lighting component of the Home Products

15   Program comprises 22%. While these are both cost-effective programs, I am

16   concerned that the concentration of almost 80% of residential savings in two

17   programs may not be a prudent efficiency decision.

18   It is important to note that the Action Plan (Exhibit NM-2) did not take

19   into account non-residential customers' ability to opt-out when evaluating I&M's

1   efficiency potential. The reduction in eligible sales, due to customers opting-out

2   of participating in I&M's non-residential program, does reduce the amount of

3   C&I energy efficiency the Company is able to achieve.

4 Q.   **Did I&M make reasonable adjustments to its Action Plan to respond to**

5   **Senate Enrolled Act 340 and non-residential customer opt-out?**

6 A.   No. Based on I&M's Discovery Request Response to CAC, only ten percent of its

7   eligible C&I customers have opted out their energy efficiency programs, yet

8   I&M's 2016 DSM plan proposes a C&I energy efficiency goal that is 100 GWh,

9   or approximately forty percent less than the identified Action Plan savings for

10   2016, shown in Table 5.[24]

11
12   **Table 5.** **2016 Commercial & Industrial DSM and Action Plan Goal (GWh)**

	Action Plan	Proposed Goal
Work Custom Rebates	62.1	<u>32.8</u>
Work Prescriptive Rebates	46.6	<u>16.8</u>
EECO	0	14.7
Work Direct Install	2.3	0
Small Business Efficiency Pilot	0	0.1
Renewable & Demonstration	0.02	0
C&I Peak Reduction	0	0
C&I Retro Commissioning Lite	50.0	0
C&I HVAC and Refrigeration Optimization	9.9	0
C&I Audit	1.8	0
EE Schools Audit	0.1	0
Total	169.0	66.7

---

[24] I&M Discovery Request Response to CAC 1-11, Attachment 1 (Exhibit NM-6).

1   Clearly, even after reducing the C&I savings by ten percent, adopting

2   Action Plan levels of energy efficiency, including more diverse residential

3   program offerings, will result in I&M achieving additional cost-effective savings

4   in 2016. While the level of savings identified in the Action Plan may not be

5   achievable in 2016, particularly because the Company filed its application so late

6   in 2015, it is a reasonable longer-term goal for I&M to achieve the level of

7   savings that were identified as being cost-effective in the Action Plan (Exhibit

8   NM-2).

9 Q.   **What existing programs can I&M modify to increase savings?**

10 A.   I&M should improve their Residential New Construction Program, increase their

11   low income program budget to 2015 levels, and improve their low income

12   program implementation.

13 Q.   **How should I&M modify its Residential New Construction Program?**

14 A.   In 2014, I&M began their Residential New Construction Program, and it

15   underperformed, reaching approximately 45% of its unit goal for 2014 by

16   providing rebates to 204 out of a targeted 449 homes. This corresponded to

17   reaching 80% of the program budget goal, 41% of its kWh goal, and more than

18   300% of its kW goal.

19   In 2015, as reported at the October Oversight Board/Public Stakeholder

20   meeting,[25] I&M had more participants than in 2014, but the program was still

21   underperforming. I&M determined in the third quarter of 2015 that it would

22   reduce its goal for new construction participation. The program, according to

---

[25] I&M DSM/EE Program Scorecard October 2015 (Exhibit NM-3).

1   I&M 2014 EM&V,[26] is based off of NIPSCO's program and both programs are

2   administered by CLEAResult. One of the perspectives offered in I&M's 2014

3   EM&V was that there were problems with builder recruitment because, curiously,

4   builders participating in NIPSCO's program and who also build houses in I&M's

5   territory were not participating in the program with I&M. This was attributed to

6   2014 being the first year of program operation, but it is unclear if this was an

7   issue that was resolved in 2015.

8   **Table 6. Estimated and Actual Residential New Construction Participation**

	2014[27]	2015[28]	2016[29]
Housing Starts[30]	119,128	119,628	120,285
Goal (units)	449	449	360
Actual (unit)	204	280	N/A
Goal (percentage of starts)	0.4%	0.4%	0.3%
Actual (percentage of starts)	0.2%	0.2%	N/A

9   I&M should increase its efforts to reach new home builders with this

10   program as they are barely scraping the surface of the new housing market in the

---

[26] I&M Witness Walter Testimony, Attachment JCW-11, 2014 PY5 Core Plus EM&V Report, pages 612-613.

[27] *Id.* at 613.

[28] I&M DSM/EE Program Scorecard October 2015 (Exhibit NM-3).

[29] I&M Witness Walter Testimony, Attachment JCW-3, 2016 DSM Plan Program Tables.

[30] "Housing starts" mean the number of new houses begun during a particular time period. I&M Discovery Request Response to CAC 8-01, I&M Housing Stock Statistics for Counties in Service Area (Exhibit NM-7). Single family homes only listed in Table 6 to err on side of caution because program is only available to residential single family, duplexes and end units of multiple family homes.

1   counties that I&M serves in Indiana. Best practice residential new construction

2   programs have reached 25-30% of new housing starts since the economy has

3   bounced back from the recession.[31] Further, the NIPSCO program that I&M's

4   program is based off of should achieve 90% of its goal in 2015, which will likely

5   surpass I&M's goal. This level of performance is indicative of what I&M's

6   program is capable of. I strongly suggest that I&M, instead of reducing their new

7   construction goal, adopt best practices from the region and country to achieve

8   higher participation rates.

9 **Q.**   **What are your recommendations for I&M's 2016 low-income program,**

10   **budget, and program implementation?**

11 **A.**   I&M currently plans to offer an Income Qualified Weatherproofing Program,

12   which is, and will be, available to customers at or below 200% of the Federal

13   Poverty Line. The program offers similar measures to the Home Weatherization

14   Program, but targets income qualified electric heat customers and pays 100% of

15   the cost of the improvements. In its application, I&M stated that customer

16   participation was a challenge and that the Company will provide targeted outreach

17   and seek partnerships with community organizations in the hopes of improving

18   participation during the fall of 2015.[32] The Company's October 2015 Oversight

19   Board scorecard (Exhibit NM-3) indicates that the program is still at 0% of its

20   goal of 1 GWh of savings, and has spent ~$193,000 on the program. In 2016, the

---

[31] York, et al. Expanding the Energy Efficiency Pie: Serving More Customers, Saving More Energy Through High Program Participation. American Council for an Energy Efficiency Economy. January 2015.
[32] I&M Witness Walter Testimony, page 29, lines 12-20.

1   Company anticipates cutting the budget and the savings target in half, shown in

2   Table 7, which seems like the incorrect solution to the participation problem;

3   particularly as there are an ample number of qualified customers in I&M's service

4   territory to participate in the program as shown in Table 8. This raises many

5   questions about the quality of I&M's delivery and administration of programs.

6   **Table 7. I&M Income Qualified Weatherization Budget and Savings Goals**

	2015	**2016**[33]
Budget	$1,205,905	$567,971
MWh	1,030	589

7   **Table 8. Poverty Levels in I&M Service Territory**

City/State	Percent of Population Below Poverty Line (2014)
Fort Wayne[34]	18.7%
Muncie[35]	33.4%
Indiana[36]	15.4%
Detroit, MI[37]	39.3%
Michigan[38]	16.8%
South Bend, IN[39]	27.8%
Marion, IN[40]	26.0%

---

[33] I&M Witness Walter Testimony, Attachment JCW-2.
[34] http://quickfacts.census.gov/qfd/states/18/1825000.html
[35] http://quickfacts.census.gov/qfd/states/18/1851876.html
[36] http://quickfacts.census.gov/qfd/states/18/1851876.html
[37] http://quickfacts.census.gov/qfd/states/26/2622000.html
[38] http://quickfacts.census.gov/qfd/states/26/2622000.html
[39] http://quickfacts.census.gov/qfd/states/18/1871000.html
[40] http://quickfacts.census.gov/qfd/states/18/1846908.html

1   Based on the fact that there appears to be a great need in I&M's service

2   territory, yet there is a lack of participation in I&M's low income program, I

3   recommend that it adopt new delivery mechanisms for its existing program and

4   increase its budget and savings goals to 2015 levels, at a minimum. Further,

5   because the program currently only targets electric heat customers, I&M should

6   coordinate its low-income offering with the gas companies that serve its

7   customers. Doing so would likely improve the cost-effectiveness of the program

8   since it will leverage gas and electric measures simultaneously, and it will

9   broaden the number of potential participants.

10   DTE Energy, a Michigan based utility, provides a great example of how

11   I&M might modify, instead of reducing, its low income program. DTE offers a

12   Low Income Self-Sufficiency Program (LSP) to customers that fall <110% -

13   150% of the poverty line. The program links DTE's utility bill assistance with

14   energy efficiency program offerings, which helps lower customer bills and stretch

15   bill assistance dollars further.

16   First, DTE uses its bill payment assistance program to inform customers of

17   energy efficiency opportunities. Working through bill assistance creates income

18   qualified leads for DTE's EE programs, and customers are more likely to

19   participate because they already have a relationship with bill assistance. DTE's

20   bill payment assistance program is only provided to customers that fall at or

21   below DTE's consumption cap, and when customers begin to hit the consumption

22   cap, DTE encourages them to participate in efficiency programs to reduce their

23   consumption. The consumption cap is set based at the average Detroit residential

1   energy consumption. DTE offers four low-income programs to reduce customer

2   consumption:

3   (1) Weatherization. Customers receive a full home audit that determines

4   what improvements are needed, upgrades are provided at no cost. Similar to

5   I&M's Residential Weatherproofing and Income Qualified Weatherproofing

6   Program, the DTE program focuses on measures such as: energy efficient

7   lighting, insulation, air sealing, programmable thermostats and hot water saving

8   devices. In addition, DTE also offers incentives on high efficiency heating

9   equipment, which I&M includes in their Home Energy Products Program.

10   (2) Lighting Distribution. DTE partners with local food banks to

11   distribute LEDs and CFLs to clients coming to pick up food from the food bank.

12   High efficiency light bulbs are offered to these customers at no cost.

13   (3) Refrigerator Replacement. DTE replaces old refrigerators at no cost

14   and recycles the unit. I&M could modify their existing appliance recycling

15   program by offering unit replacement for refrigerators exceeding a certain age.

16   In addition to using bill assistance to generate efficiency program

17   participation, DTE's LSP program provides customers with the option for a fixed

18   monthly bill, based on their income. The bill ranges from $50-60 per month for

19   customers that are <110 - 150% of the federal poverty line, and receive only

20   electric service from DTE. This range of bill puts the customer's energy bill at six

21   percent or less of the customer's income, a level DTE has identified as an

22   affordable energy burden. Finally, DTE eliminates 1/16th of the customer's pre-

23   program arrears for each quarter they participate in the program, and keep their

1   consumption below Detroit's average residential consumption. Effectively, if the

2   customer stays in the program for four years, all pre-program arrearages will be

3   forgiven.

4   The funding to pay the difference between the customer's fixed payment

5   and the actual bill is partially provided through a grant from the state of Michigan,

6   so identification of a funding source for the fixed bill component of the program

7   is necessary. DTE has identified a number of non-energy benefits that accrue to

8   all customers due to the LSP program offerings including: reduced truck rolls to

9   turn energy on and off, reduced customer service phone time, and reduced

10   carrying costs on arrearages.

11   The Low Income Self Sufficiency Program has been very successful in

12   keeping customers out of the disconnect cycle, bringing the service disconnect

13   rate for customers down to two percent, as compared to 55 percent with other low

14   income program offerings. Further, 97% of these customers are able to keep their

15   energy consumption at or below the Detroit residential average energy

16   consumption, as compared to 50 percent with other low income program

17   offerings.

18   Q.   **What additional programs and measures should I&M offer?**

19   A.   There are many additional program opportunities that I&M should pursue,

20   including: (1) low income neighborhood and moderate income weatherization

21   programs identified in I&M's Action Plan; (2) an upstream manufactured home

22   program; (3) a multifamily program; (4) a modified version of Energizing Indiana

23   Third Party Administrator's school audit direct install program; and (5) a self-

28

1   direct program for non-residential customers. I will discuss each of these

2   recommendations in detail below.

3   Q. **What is your recommendation regarding the Residential Neighborhood and**

4   **Moderate Income Weatherization programs that were included in I&M's**

5   **Action Plan?**

6   A. In the 2013 update to I&M's Action Plan, one of the program recommendations

7   was the "Residential Neighborhoods" program. This program is targeted primarily

8   to households at or below 150 percent of poverty. The program offers similar

9   measures to the proposed Income Qualified Home Weatherproofing, but the

10   implementation is neighborhood focused. The program administrator identifies a

11   specific neighborhood with approximately 60 percent low-income customers and

12   approaches local leaders in an organized effort to secure community participation.

13   I&M's consultant estimated that this program would save 1.8 GWh in 2016.[41]

14   Another program is the "Moderate Income Weatherization" program. This

15   program provides a home weatherization inspection audit, blower-door leak tests,

16   and recommendations to the homeowner for incented weatherization measures.

17   This program targets electrically heated homes that have incomes above the

18   qualification criteria for the Core Income Qualified Weatherization program but

19   below 300% FPL. The program is designed to ensure the retrofit installation of

---

[41] I&M Discovery Request Response to CAC DR 1-6, Updated Action Plan, page 80
(Exhibit NM-2).

1   major weatherization measures in households. I&M's consultant estimated that

2   this program would cost-effectively save 3.6 GWh in 2016.[42]

3   Based on the Oversight Board/Public Stakeholder program reports, it does

4   not appear that I&M offered either of these programs in 2014 or 2015. It is

5   unclear why I&M did not adopt these programs if their consultant's report which

6   is paid for by ratepayers included this recommendation. It is also unclear if I&M

7   considered shifting from its current low income program to either of these

8   programs to increase participation.

9   I recommend that I&M re-evaluate if these are appropriate programs to

10   offer, and provide an explanation if the Company finds they are not appropriate.

11   In particular, the Residential Neighborhood program is generally cost-effective

12   when implemented in other jurisdictions; so unlike I&M's existing low-income

13   weatherization program, it provides cost-effective benefits both to program

14   participants and to all customers through system wide fuel and energy reductions.

15   Subsequently, I&M should consider offering this program in addition to the

16   Moderate Income Weatherization and modified low income weatherization

17   program with better delivery mechanisms discussed above.

18 Q. **What are your recommendations for an upstream manufactured home**

19   **program?**

20 A. I am aware that I&M's Action Plan shied away from making a new manufactured

21   home program recommendation due to the "relatively small stock and yearly

---

[42] I&M Discovery Request Response to CAC DR 1-6, Updated Action Plan, page 62 (Exhibit NM-2).

1   increment of manufactured homes in I&M's territory."[43] However, I am skeptical

2   of this conclusion given that there are approximately 33,000 new manufactured

3   homes installed per year in the counties that I&M serves.[44] While this may only

4   represent five percent of new housing starts, I believe the highly cost-effective

5   savings that are available are worth investing in.

6   Further, given the use of manufactured homes as affordable housing and

7   I&M's poor performance serving its low income customers with EE programs, it

8   is a critical opportunity that I&M should not dismiss. Robust EE programs for

9   low- and fixed-income households are essential to ensuring that all customers are

10   able to afford basic utility service on a sustainable basis, particularly because low-

11   income residents tend to live in less efficient housing. Given the absence of a

12   program that serves the new manufactured home market, I recommend I&M

13   implement an upstream efficiency program that is targeted at manufactured home

14   producers, similar to a program offered by the Tennessee Valley Authority

15   ("TVA"). In TVA's program, it pays the manufacturer of the homes to build

16   homes to ENERGY STAR or ENERGY STAR plus standards. When the

17   consumer purchases a new home, there is no cost differential between the heat

18   pump version and the electric resistant heat version, yet there are tremendous

---

[43] I&M Discovery Request Response to CAC DR 1-6, Updated Action Plan, page 63
(Exhibit NM-2).
[44] I&M Data Request Response to CAC 8-01 (Exhibit NM-7).

1   energy savings. TVA estimates each home saves approximately 12,000 kWh a

2   year.[45]

3   I&M should also consider Idaho Power's Rebate Advantage program,

4   where customers that purchase new all-electric ENERGY STAR manufactured

5   homes receive a $1000 sales rebate and sales consultants receive a $200 sales

6   bonus every time they sell a new all-electric ENERGY STAR manufactured home

7   to an Idaho Power customer.[46]

8   Finally, I&M should clarify that its Home Energy Products, Home

9   Weatherproofing, Home Energy Reports, Home Online Energy Checkup Income

10   Qualified Weatherproofing, and Home Comfort & Efficiency Pilot, are in fact

11   available to manufactured home owners and renters.

12   **Q.   What is your multi-family program recommendation?**

13   **A.**   I&M could target a program at the traditionally hard to reach affordable, existing

14   multi-family buildings. I&M allows multifamily tenants and owners to participate

15   in a few of its proposed programs,[47] but does not offer a program specifically

16   targeting this sector. A nationwide effort, led by the Natural Resource Defense

17   Council and The National Housing Trust, has created a program that is referred to

18   as Energy Efficiency For All. In Minnesota, Xcel Energy and Centerpoint Energy

---

[45] ACEEE's Third National Review of Exemplary Energy Efficiency Programs, June
2013, http://bit.ly/18jRRhL.
[46] Idaho Power, 2014 DSM Annual Report,
http://www.puc.idaho.gov/fileroom/cases/elec/IPC/IPCE1404/20140317DSM%20ANNU
AL%20REPORT%202013.PDF.
[47] Home Energy Products Program allows multifamily tenants or owners in buildings
with less than 12 units to participate in the program; Residential Peak Reduction Program
allows multifamily homeowners to participate, and the Home New Construction allows
end units of multifamily buildings to participate.

1   used the NRDC/National Housing Trust program model to develop a program

2   targeted at multifamily building owners that created a "one-stop shop" for

3   building efficiency improvements.[48]

4   Franklin Energy, the Minnesota utilities' implementer, works with a

5   building owner to conduct a building assessment to identify efficiency

6   improvements and, at the same time, direct installs efficient lighting and low-flow

7   water equipment. The implementer then identifies efficiency opportunities and

8   develops a series of upgrade options to achieve various energy savings levels. The

9   information is presented to the building owner in the form of a pre-approval of the

10   potential projects. Building owners that have multiple properties can work with

11   the program implementer to prioritize buildings based on the size of the efficiency

12   opportunity.

13   The building owner selects improvements and the implementer creates job

14   specs, a timeline, assesses bids by contractors and assists the building owner with

15   selecting a winning bid. After the contractor performs the efficiency

16   improvement, the implementer oversees QA/QC to ensure that the improvements

17   were made correctly. After the program implementer certifies that the

18   improvements were correctly made, the building owner receives the incentive

19   payment. Xcel Energy and Centerpoint Energy provide tiered incentives based on

20   the amount of energy saved, as shown in Table 9 below.

---

[48] Minnesota Department of Commerce, Docket No. E, G-002/CIP-12-477 and Docket No. G-008/CIP-12-564. Request for Modification: Proposing a New Multi-Family Building Efficiency Program. Filed February 20, 2015, approved May 27, 2015.

1   **Table 9. Xcel Energy and Centerpoint Energy Multifamily Incentives**[49]

Achievement Level	Whole-Building Energy Savings Achieved	Incentive Level	Low Income Incentive Level
Tier 1	15%	25% of cost	50% of cost
Tier 2	20%	35% of cost	70% of cost
Tier 3	25%	40% of cost	80% of cost

2   The incentive level is applied to the total cost of installing approved energy

3   related measures; and if the building is qualified as low income, it is eligible for

4   twice as much incentive. As proposed, the program was cost-effective for Xcel's

5   and Centerpoint's gas and electric customers, shown in Table 10, and the utilities

6   will conduct EM&V at the end of 2016 to evaluate the program performance.

7   **Table 10. Xcel and Centerpoint Energy Benefit-Cost Scores**

Utility	TRC		UCT	
	2015	2016	2015	2016
Xcel Electric	0.95	1.08	1.25	1.50
Xcel Gas	N/A		0.92	0.92
Centerpoint Gas	N/A		1.31	1.56

8   In December 2015, a similar program was approved for Consumer Energy

9   by the Michigan Public Service Commission.[50] Consumer Energy also focused on

10   the "one stop-shop" delivery mechanism, and will offer similar incentives for

11   installation of multiple measures, participation by subsidized income qualified

12   properties and unsubsidized affordable housing. Consumer Energy anticipates that

[49]
http://www.xcelenergy.com/Energy_Solutions/Business_Solutions/Customized_Solutions/Multi-Family
[50] Michigan Public Service Commission, Order Approving Settlement Agreement, Case No. U-1771. December 22, 2015. Available at
http://efile.mpsc.state.mi.us/efile/docs/17771/0031.pdf

1   it will save 7.8 GWh with this program in 2016 alone, significantly more than the

2   1.1 GWh that I&M proposes it will save with its Income Qualified

3   Weatherproofing and Home Weatherproofing combined.

4   Finally, based on a May 2015 report by the Natural Resource Defense

5   Council, this type of affordable multifamily program could save 19-32% of

6   electricity, relative to sales forecast in 2034, in Illinois and 26-37% in Michigan.[51]

7   The report did not look at the efficiency opportunity in Indiana, but these two

8   neighbor states are a strong indicator of the significant savings associated with

9   multifamily energy efficiency.

10 **Q.** **Please describe your non-residential school audit direct install program**

11   **recommendation.**

12 **A.** I&M should re-implement its School Audit Direct Install program. In 2014, I&M

13   (through its Third Party Administrator) achieved over 415 net MWh with the

14   School Audit Direct Install (SADI) Program, a program that provided audits and

15   direct installation of certain measures in schools.[52] This equates to over 560% of

16   I&M's goal for this program. Based on I&M's 2014 EM&V, the SADI program

17   offered direct installation of: vending machine timers, smart power strips with

---

[51] Potential for Energy Savings in Affordable Multifamily Housing Final Report.
Prepared for NRDC by Optimal Energy, May 2015. Available at
http://www.energyefficiencyforall.org/sites/default/files/EEFA%20Potential%20Study.pd
f
[52] 2014 Energizing Indiana Evaluation Report, May 1, 2015, page 104, Table 134,
available at:
https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.a
spx?DocID=0900b631801c7d3d (CAC Administrative Notice Exhibit 4).

1   occupancy sensors, CFLs, room occupancy sensors and LED exit signs.[53] The

2   SADI program is different than I&M's Energy Efficient School program because

3   the SADI program focused on the installation of measures at the school, while

4   I&M's Energy Efficient School program focuses on student education and

5   outreach. The 2014 EM&V report found that when evaluating spillover, 96% of

6   the recommendations offered in the audit were not eligible for an energy

7   efficiency program incentive.[54] For I&M, there were 243 MWh of savings that

8   schools took on their own accord and that showed up as spillover.[55] While it is

9   fantastic that these schools implemented measures without incentives, it is likely

10   that even more uptake would occur if the School Audit and Direct Install

11   program, or Work Prescriptive program, offered incentives to cover these

12   measures. In fact, the number one recommendation for the program in the 2014

13   EM&V report was to consider providing financing mechanisms.[56] While rebates

14   are not financing, they certainly reduce the upfront capital required to make

15   energy efficiency investments. The most common measures identified in the audit

16   that were installed by schools were: lighting, air temperature controls and

17   information technology.[57] Other measures installed in the 2-5 year timeframe

18   were: occupancy sensors, HVAC, and building re-commissioning.[58] At minimum,

19   I&M should consider offering incentives on these measures through their Work

---

[53] *Id.* at 83-84.
[54] *Id.* at page 103.
[55] *Id.* at page 104.
[56] *Id.* at 120.
[57] *Id.* at 118.
[58] *Id.* at 103.

1   Prescriptive Program to reduce the upfront capital cost for schools to install these

2   measures.

3   Q.   **Please discuss your non-residential self-direct program recommendation.**

4   A.   I&M should offer its large customers a self-direct program, particularly because

5   of its low opt-out rate. In Cause No. 44310, a proceeding to investigate a self-

6   direct program, the Commission found that:

7   Based on the significant change in the statutory landscape and the
8   resulting impact on the manner in which DSM programs are
9   designed...we find that any further consideration of a structured self-direct
10   DSM program for large customers should occur when an electricity
11   supplier submits its plan for Commission approval.[59]

12   Energy efficiency is the lowest cost resource, and I&M should look for

13   reasonably achievable ways to attract and retain energy efficiency program

14   participation from their large customers. Accordingly, I recommend that I&M

15   offer a self-direct program as it is reasonable and in the public's interest. It is

16   worth mentioning that without revisions to the net lost revenue recovery, I do not

17   think that any industrial customer will participate in an energy efficiency offering

18   from any utility in Indiana.

19   Self-direct programs offered by other utilities could serve as models for

20   I&M's program. For example, Rocky Mountain Power offers a self-direct credit

21   program that is available to Utah business customers who meet minimum usage

22   requirements of 5,000,000 kWh per year or have a peak load of at least 1,000 kW

---

[59] IURC Cause No. 44310 Order of the Commission, May 20, 2015, available at
https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.a
spx?DocID=0900b631801c712b (CAC Administrative Notice Exhibit 5).

1   in the prior 12 months. Customers are responsible for providing the energy

2   engineering work necessary to document the energy savings of proposed projects.

3   Incentives of 50-80% of the eligible expense are provided in the form of credits

4   used to offset the DSM Cost Adjustment surcharge on the monthly bill and are

5   available for both new construction and retrofit projects.[60]   In this example,

6   participants in the self-direct program would opt-in to the utility program, and the

7   customers would pay the DSM tariff, but then receive a credit to offset the tariff.

8   The utility would be able to count the savings toward their efficiency goal, and

9   the non-residential customers would be required to pay lost revenue. As I

10   mentioned above, without a revision to the current lost revenue structure, this is

11   not likely to be appealing to non-residential customers.

12   Another option with a self-direct program would be to continue to allow

13   customers to opt out, but require that those customers opting out of the program

14   achieve verifiable efficiency savings.

15 **Q. Do you have other recommendations for the self-direct program?**

16 **A.** Yes. As discussed in CAC's testimony in Cause No. 44310, (1) projects should

17   generate capacity savings and not just time-shifting of energy consumption; (2)

18   projects started prior to being approved as a self-direct project should not be

19   eligible for funding or credit; and (3) self-direct customers should be required to

---

[60] Evaluation Report for Utah's Self-Direction Credit Program (PY 2012 through 2013)
Prepared by Navigant for Rocky Mountain Power, available at:
http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_
Management/2015/Self-Direction_Program_Evaluation.pdf.

1   share their plans with the administrator or other parties interested in implementing

2   similar projects, subject to scrubbing the plans for confidentiality.

3   Q.   **Do you have recommendations about self-direct EM&V?**

4   A.   Yes. I recommend that third party evaluation, measurement and verification occur

5   on a comparable schedule to I&M's EM&V schedule and be required to use the

6   same standards for data collection as I&M's efficiency programs. Important

7   features of the EM&V are that it is consistent across customers, transparent and

8   accountable. Without verification of energy efficiency savings, the reduction in

9   load that occurs from these customers' energy efficiency projects will not be

10   attributed to energy efficiency. This is important because it provides the utilities

11   with an idea of how much energy their large customers are saving, and insight

12   into how much they will save in the future. This is useful for system-wide

13   planning and ensuring that the Company can provide Indiana ratepayers with the

14   lowest cost, reliable electricity system. In fact, this Commission has recognized

15   energy efficiency as "the most cost effective way of meeting future energy supply

16   needs and [that it] has the corresponding benefit of reducing the need to build

17   additional generation capacity."[61]

18   Further, without greater accountability, these customers that do not install

19   energy efficiency measures on their own can act as "free riders" that receive, at no

20   cost, the system-wide benefit of energy efficiency savings produced by

21   participating customers. One of these system-wide benefits is the Demand

22   Reduction Induced Price Effect ("DRIPE"), which refers to the price suppression

---

[61] IURC Cause No. 42693, Phase II Order at 30 (December 9, 2009).

1   that occurs when reduced demand on a system reduces the market-clearing price,

2   and the price paid by all load. Recent research on DRIPE found that a one percent

3   reduction in load over Illinois and a large part of MISO would reduce Illinois

4   market prices by about two percent. Specifically, a reduction in load in ComEd's

5   territory would reduce ComEd's generation bills by 36-70% of the ComEd

6   avoided energy cost.[62]

7   Q.   In Phase II of Cause No. 44441 regarding requests for Commission

8   consideration of other issues related to or arising as a result of the industrial

9   customer opt out provided for in Senate Enrolled Act 340, the Commission

10   ruled that a number of issues were not appropriate for consideration in that

11   docket, but that they may be appropriate issues to discuss in individual

12   utility DSM tracker or program approval proceedings.[63] What are those

13   issues?

14   A.   There were seven (of nine) issues presented by CAC that the Commission

15   identified as being potentially appropriate to discuss in program approval

16   proceedings:

17   • Issue 1–the impact on regulated electric utilities and customers of a utility
18   resource portfolio that does not include industrial energy efficiency resources;
19   • Issue 2–whether industrial customers that opt out should be considered "free
20   riders" and continue paying the fixed costs of DSM programs;

---

[62] Resource Insight Memorandum on Analysis of Electric Energy DRIPE in Illinois,
September 2014, available at:
http://switchboard.nrdc.org/blogs/pkenneally/IL%20DRIPE%20Memo%20Final.pdf.
[63] IURC Cause No. 44441, Phase II Order at
https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.a
spx?DocID=0900b631801bcbda (CAC Administrative Notice Exhibit 6).

1　　　　　• Issue 4–whether and how energy and demand savings from industrial
2　　　　　　customers that opt out can be used by regulated electric utilities in the IRP
3　　　　　　process;
4　　　　　• Issue 6–whether the Commission should adopt rules or guidelines to assist
5　　　　　　customers in complying with the opt out provision in SEA 340 or to require
6　　　　　　opt out customers to provide EM&V reports concerning the customers' own
7　　　　　　energy efficiency measures;
8　　　　　• Issue 7–whether an oversight board should be established to monitor and
9　　　　　　evaluate compliance with SEA 340;
10　　　　• Issue 8–determination of a mechanism to be used by opt out customers to pay
11　　　　　　for the regulated electric utilities' administrative expenses related to
12　　　　　　implementing the opt out provisions; and
13　　　　• Issue 9–establishment of criteria for determining "reasonable and cost
14　　　　　　effective" DSM programs and the role of various oversight boards in
15　　　　　　developing DSM programs.

16　Q.　　Would you like to discuss any of these issues from Cause No. 44441, Phase

17　　　　II?

18　A.　　Yes, I would like to discuss two issues in this testimony: issue six, specifically,

19　　　　whether the Commission should adopt rules or guidelines to assist customers in

20　　　　complying with the opt out provision in Senate Enrolled Act 340; and issue nine,

21　　　　specifically, reasonable and cost-effective DSM programs.

22　Q.　　Please describe the status of opt-outs by large customers from I&M's

23　　　　programs.

24　A.　　Qualifying industrial and large commercial customers may opt out of I&M's

25　　　　efficiency programs and associated rider by providing the Company with notice

26　　　　by November 15 of the year prior to the desired opt-out year. Unfortunately, 10%

27　　　　of I&M's eligible load and almost half of the eligible load for both NIPSCO and

28　　　　DEI have opted out of utility DSM programs as shown here in Table 11.

1   <u>Table 11.</u> EE Opt Out as Percentage of Eligible Load

	Opt out
NIPSCO[64]	42%
DEI[65]	49%
Vectren[66]	75%
I&M[67]	10%

2 Q.   **Has I&M taken any action to reduce its opt-out rate?**

3 A.   It does not appear that the Company has taken any targeted action to bring opted

4   out customers back into its programs. In response to CAC's inquiry about what

5   actions the Company has taken, I&M discussed the ability of customers to view

6   opt out information on-line.[68]   The Company also mentioned their letter

7   discussing the opt-out process and deadlines (which I recommend in this

8   testimony should be amended).

9 Q.   **Are there reasonable and cost-effective DSM programs that I&M could and**

10   **should offer to bring its opted out customers back to its programs?**

11 A.   Yes. As noted above, a self-direct program should be implemented. Also, upon

12   review of I&M opt out letter, it appears that the Company should modify the

13   language to focus on the benefits the customer is declining when it opts out of

14   efficiency programs. Currently, the language focuses on the ease with which the

---

[64] Cause No. 44634, NIPSCO Discovery Request Response to CAC Set 2-006, Attachment A (<u>Exhibit NM-8</u>).

[65] Cause No. 43955 DSM 3, Duke Witness Douglas' Public Workpaper #2 (<u>Exhibit NM-9</u>).

[66] Cause No. 44645, Vectren Discovery Request Response to CAC 2-5 (<u>Exhibit NM-10</u>); *see also* Cause No. 44645, Petitioner's Exhibit No. 2 (Huber), p. 24, lines 13-14, which says approximately 76% of eligible load has opted-out.

[67] I&M Discovery Request Response to CAC Set 1-11, Attachment 1 (<u>Exhibit NM-6</u>).

[68] I&M Discovery Request Response to CAC 1-13 (<u>Exhibit NM-11</u>).

1   customer can opt out of the program. I&M should consider adding an additional

2   page with a case study of a successful energy efficiency project likely applicable

3   to the customer as an example of the upside of the energy efficiency programs.

4   Finally, I&M should consider additional programs that will entice opt out

5   customers in its particular service territory back into participation in the programs,

6   such as a program geared towards fabricated metals processes, health and social

7   care facilities, printing, machinery manufacturing, and plastic manufacturing.

8 **Q.** **Two of your program recommendations that you offered, the low income and**

9   **multifamily programs, were based on programs implemented in Michigan.**

10   **How is I&M performing on energy efficiency in Michigan?**

11 **A.** As an electric utility in Michigan, I&M is required to achieve 1% of prior year

12   sales with energy efficiency savings each year after 2012, so the Michigan arm of

13   the Company is saving more energy than here in Indiana, where I&M achieved

14   approximately 0.77% savings in 2014. As I discuss more below, I recommend

15   that I&M's performance incentive be based off of a model recently approved by

16   the Michigan Commission.[69]

17 **Q.** **Do you have any other concerns about I&M's program administration or**

18   **Oversight Board?**

19 **A.** I am not a member of the I&M Oversight Board ("OSB") but I am aware from

20   conversations with CAC that, through a Settlement Agreement, I&M recently

---

[69] I am aware that I&M has a financial incentive that is based on multiple performance metrics and was authorized from 2014-2015. My recommendation is based on Consumers Energy's incentive because it is simpler and promotes the utility adopting all cost-effective efficiency.

1   changed its OSB structure in an effort to increase operational efficiencies, but the

2   outcome has been unsatisfactory to CAC. Generally, there has been a lack of

3   substantive conversations about the portfolio performance at the I&M OSB

4   meetings, and the Company has not been providing the scorecard to members in

5   advance of the meeting or distributing the materials via email. This creates

6   operational inefficiencies, which was not the goal of the structure change.

7   Further, as discussed above, there are clear opportunities for I&M to

8   improve its program implementation, and spend its designated budget on cost-

9   effective energy efficiency to benefit its customers. CAC does see value in the

10   public participation aspect that is currently in place and recommends that aspect

11   remain, but that the OSB return to the pre-Settlement requirements to ensure that

12   I&M has more oversight and is actually delivering robust and effective programs.

13   Additionally, CAC sees great value in the Commission staff being involved on

14   I&M's OSB, considering the program delivery problems I&M has faced this year.

15   **Q.**   **Please summarize your program recommendations.**

16   A.   I recommend that I&M: (1) pursue all reasonably achievable savings by

17   increasing the goals for those programs unaffected by opt-out customers to levels

18   consistent with Action Plan; (2) spend their entire DSM budget, (3) modify new

19   construction and low income programs; (3) re-evaluate if the Neighborhood

20   Energy and Moderate Income are appropriate programs to offer, and provide an

21   explanation if the Company finds they are not appropriate; (4) offer a program for

22   multifamily homes, new manufactured homes, direct install for schools, and non-

23   residential; (5) implement an upstream efficiency program that is targeted at

1   manufactured home producers; (6) offer a school energy efficiency program that

2   compliments the use of energy efficiency service companies; (7) offer a C&I self-

3   direct program that meets the criteria I discussed, and requires robust evaluation,

4   measurement and verification; and (8) offer more complete information about the

5   available C&I programs to opt out eligible customers, especially when I&M sends

6   out opt out notification letters and forms, as well as offer more programs

7   specifically catered to these customers to entice them back into participation; and,

8   (9) I&M's OSB return to the pre-Settlement oversight requirements.

9   IV.   **I&M'S PLAN IS NOT REASONABLE, NOT IN THE PUBLIC INTEREST,**

10   **AND NOT COST EFFECTIVE AS IT RELATES TO I&M'S PROPOSED**

11   **LOST REVENUE RECOVERY.**

12   **A.   I&M'S   PROPOSED   LOST   REVENUE   ADJUSTMENT**

13   **MECHANISM IS ASSYMETRICAL.**

14 Q.   **How are lost revenues defined in Indiana?**

15 A.   The IURC defines lost revenues as "the revenue lost less the variable operating

16   and maintenance costs saved as a result of not generating electricity because of a

17   utility sponsored DSM program."[70] Lost revenues is undefined under Ind. Code §

18   8-1-8.5-9 and is not even mentioned under the ARP statute. But, Senate Enrolled

19   Act 412 (2015) as codified in Ind. Code § 8-1-8.5-10 defines lost revenues as "the

20   difference, if any, between: revenues lost; and the variable operating and

_____

[70] 170 IAC 4-8-1, Section 1(u). Please note, however, that a rulemaking involving both
170 IAC 4-8 and 170 IAC 4-7 is currently underway in IURC RM # 15-06. CAC is
requesting that the outcome of this proceeding be made subject to the outcome of IURC
RM #15-06.

1   maintenance costs saved; by an electricity supplier as a result of implementing

2   energy efficiency programs."

3 **Q.**   **In theory, do you support allowing I&M to recover lost revenue?**

4 **A.**   Yes, if there is actual "lost" revenue. Consistent with prior CAC testimony, if

5   recovery of lost revenues is allowed, it should be limited to the amount associated

6   with decreases in sales that are directly attributable to the implementation of

7   Commission approved EE programs and only to the extent it impacts the

8   Company's authorized cost recovery.

9   This would be consistent with Ind. Code § 8-1-8.5-9 and its requirement

10   that the portfolio be cost-effective, which I&M's plan cannot be without adjusting

11   its lost revenue proposal significantly. This would also be consistent with

12   Indiana's relevant definitions of "lost revenues" in Senate Enrolled Act 412

13   (2015) as codified in Ind. Code § 8-1-8.5-10: "the difference, if any, between:

14   revenues lost; and the variable operating and maintenance costs saved; by an

15   electricity supplier as a result of implementing energy efficiency programs."[71]

16   Furthermore, Ind. Code § 8-1-8.5-10(o) states that if the plan is found to be

17   reasonable under subsection (h), the Commission shall allow *"reasonable*

18   *financial incentives"* and *"reasonable* lost revenues" (emphasis added). The

19   current structure of recovery of lost revenues for I&M, however, is not

20   reasonable, not in the public interest, and not cost effective under all applicable

21   statutes.

---

[71] *See also* 170 IAC 4-8-1, Section 1(u). Please note, however, that a rulemaking
involving both 170 IAC 4-8 and 170 IAC 4-7 is currently underway in IURC RM # 15-
06.

1   Finally, 170 IAC 4-8-6 already requires consideration of freeriders. I&M

2   should be required to include customer load growth, off-system sales, and

3   changes in other revenue structures when proposing any lost revenue adjustment

4   mechanism. Changes in these factors between rate cases provide the utility with

5   additional cost recovery that should be offset in any lost revenue mechanism.

6 **Q.   Has I&M provided evidence that it has lost revenue due to the EE program**

7   **implementation?**

8 **A.**   No. I&M stated, in its 2015 DSM Plan filing:

9   The reduced customer usage that results from DSM programs leads to
10   reduced revenue for the Company and thus reduced recovery of fixed
11   costs during period between basic rate cases.[72]
12
13   Yet I&M did not substantiate its claim of reduced recovery of fixed costs in its

14   DSM plan filing. It is unreasonable, not in the public interest, and not cost

15   effective for I&M to recover lost revenues if there is no evidence the revenues are

16   actually lost. This lack of quantitative support for lost revenue in the utilities'

17   applications is why I&M's lost revenue adjustment mechanism ("LRAM") is

18   asymmetrical – the utility makes no adjustment for increases in revenues due to

19   activities unassociated with DSM and appears to assume that lost revenues due to

20   DSM always occur.

21   Figure 1 below, taken from ACEEE's recent LRAM research, illustrates

22   the potential for a utility to over earn if a LRAM is implemented without

23   symmetry, or regard, for the overall utility rate of return. The black line represents

24   a generic amount of revenue the utility is permitted to recover and the blue

---

[72] Cause No 44486, Testimony of David Roush, page 4, lines 15-18.

1   triangle represents the amount of revenue the utility recovered due to its lost

2   revenue adjustment mechanism. The bottom two green triangles represent the

3   expected and actual revenue recovered. Due to additional sales, the dark green

4   triangle pushes the blue triangle (lost revenues) beyond the utility's revenue

5   requirement.

6   **Figure 1. Illustration of Potential for Over-Earning with LRAM**[73]
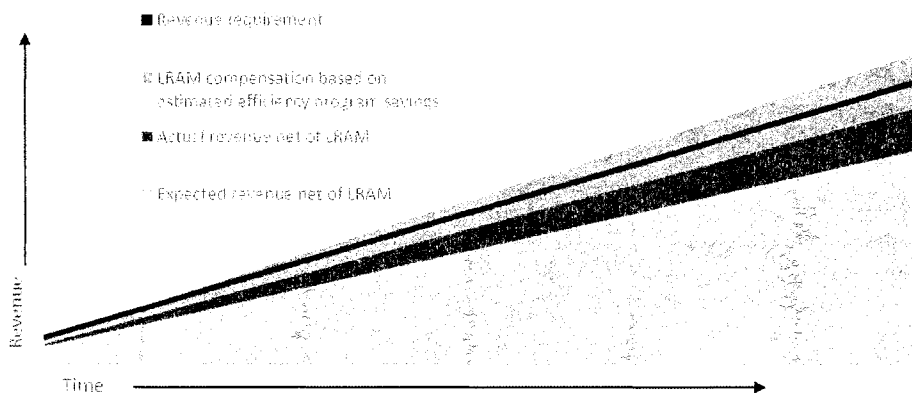
7   I&M's LRAM would be symmetrical if it took into account its actual

8   revenues before and after the application of its lost revenue. If increased sales or

9   other factors result in actual revenue pushing I&M past its revenue needs, it

10   should not collect any lost revenue at all.

11   **Q.   How would I&M demonstrate that it did not recover necessary revenues**

12   **because of its energy efficiency programs, and is in need of lost revenues?**

13   **A.**   I&M should compare sales in its test year to the actual sales, and if there is a

14   difference between that test year and the actual year, then I&M may be eligible

15   for lost revenues. If the actual sales, after the effects of EE are included, are still

---

[73] American Council for an Energy Efficiency Economy, Review of Lost Revenue
Adjustment Mechanisms. June 2015, page 4, Figure 2 (Exhibit NM-12).

1   sufficient to allow the Company to recover its authorized revenue (for example,

2   when sales are above forecasted levels), there is no legitimate rationale to use

3   ratepayer money to compensate the Company for "lost" revenues that were not

4   incurred. This would be essentially asking utility ratepayers to guarantee excess

5   revenues to the utility, and this is not reasonable. However, if the Company's

6   sales, after the effects of EE, are insufficient to allow the Company to recover its

7   authorized costs, then the Company would be eligible for lost revenues.

8   Q.   **After it has been established that a utility has actually "lost" revenue, what is**

9   **a reasonable period of time to allow recovery of lost revenue?**

10   A.   Lost revenue recovery is meant to be a short-term solution to address revenue loss

11   in between rate cases. As noted below, if recovery of lost revenue is allowed, it

12   should be limited to three years or the life of the measure, whichever is shorter, to

13   avoid the "Pancake Effect."

14   Further, based on ACEEE's recent LRAM research:

15   It is most common for states to limit recovery to one to three years,
16   although many states allow utilities to recover lost revenues for an
17   indefinite period of time...Respondents indicated that in these
18   cases, although rules might not be in play...utilities tend to bring
19   [rate cases] forward every two to three years.[74]

20   Q.   **Has I&M been denied or otherwise had limits on lost revenue recovery in**

21   **Indiana before?**

22   A.   Yes. It appears that I&M reached a settlement in Cause No. 43769, which allowed

23   I&M to request lost revenue recovery in a future proceeding, meaning that I&M

---

[74] American Council for an Energy Efficiency Economy, Review of Lost Revenue
Adjustment Mechanisms. June 2015, page 21 (Exhibit NM-12).

1   apparently did not have authority to collect lost revenues at all prior to that. Thus,

2   I&M filed for net lost revenue recovery in Cause No. 43827, which appears to

3   have been granted without a limit on the time period of lost revenue recovery.[75]

4   The Commission approved the net lost revenue recovery request in its Final Order

5   on September 22, 2010.

6   Q.   **Have other states allowed lost revenue recovery for the life of the measure or**

7   **until a rate case and determined that the LRAM policy should change?**

8   A.   Yes. After the Minnesota Public Utility Commission allowed the largest IOU

9   (Northern States Power) to recovery 50-75 percent of reported lost revenues, the

10   Minnesota Department of Public Service expressed the following concerns:

11   • The period between rate cases is much longer than that envisioned when [the
12   lost margin policies] were approved, significantly increasing the level of lost
13   margins accrued.
14   • Lost margins increase rates without any tangible benefits to ratepayers.
15   • True lost margins are shrinking because, in the long run, "fixed" costs become
16   variable costs.
17   • Utilities have growing opportunities to sell their saved energy on the
18   wholesale market.
19   • [I]t has now been 12 years since Otter Tail Power filed a rate case, 5 years
20   since NSP-Electric filed, 4 years since Minnesota Power filed, and 3 years
21   since Interstate filed. The frequency of rate cases is an important issue. The
22   longer time lag has increased lost margins significantly, thereby raising the
23   costs of electric utilities' DSM investments to ratepayers.
24   • Clearly, [lost margin recovery was] intended to compensate utilities for short-
25   term revenue losses between relatively frequent general rate proceedings.
26   They were not intended to provide long-term windfall gains to shareholders.[76]

---

[75] *See* Cause No. 43827, Direct Testimony of Roush, Exhibit DMR-1 (November 11,
2009).
[76] Minnesota Public Utility Commission, Docket No.98-443, Order issued June 24, 1998,
Page 8.

1   **Q.**   **Why should lost revenues be limited to a short period of time?**

2   **A.**   As noted by the Minnesota Department of Public Service over fifteen years ago,

3   lost revenue recovery is meant to be a short-term adjustment to address revenue

4   losses in between rate cases. In the absence of requiring a rate case every 2-3

5   years, the amount of lost revenue the utilities recover should be limited. It is also

6   important to note that the utility is able, through integrated resource planning and

7   rate cases, to adjust their longer term plans to avoid spending revenue

8   unnecessarily if efficiency can defer or eliminate the need for additional capital

9   expenditures, and thus lost revenues. However, at this time, Indiana's policy

10   allows the utility to collect revenues that would not be "lost" through prudent

11   planning.

12   In Indiana, the rationale for a cap of 36 months of lost revenue can also be

13   found in Senate Enrolled Act 412, which requires the utilities to submit energy

14   efficiency plans at least once every three years.

15   In addition, there is a high risk that ratepayers will pay for revenues that

16   are not actually "lost" if the Commission continues to allow I&M to collect lost

17   revenues for the life of the measure, or until it has a new rate case because the

18   energy baseline will change in the future. For example, the Energy Independence

19   and Security Act ("EISA") of 2007 created a new baseline for lighting that had

20   profound impacts on the DSM industry. If another lighting standard were

21   introduced, the utility should not be able to recover lost revenue unless the

22   measures go above the standard. In order to appropriately calculate lost revenues,

23   the Company would need to track what types of lamps were installed in each year

1   to determine if the measure continues to be above the baseline, and thus eligible

2   for lost revenue recovery. This adds a layer of complexity and opacity that can

3   largely be avoided by limiting the lost revenue recovery period.

4   **Q.   Do Duke Energy Indiana, NIPSCO, Vectren and I&M use the same**

5   **methodology to calculate lost revenues?**

6   **A.**   No. Currently, there are significant inconsistencies in how DEI, I&M, NIPSCO

7   and Vectren calculate their lost revenues as shown in <u>Table 12</u>.

8   <u>**Table 12.**</u> **Qualitative description of specific components of NLR methodology**

	Freeriders and Spillover	Request for Demand Response LR Recovery	Tail or Average Rate
Duke Energy Indiana	Includes both	Yes	Average rate for all classes
I&M	Includes freeriders for all programs and spillover for some programs[77]	No	Average rate for residential and commercial classes
NIPSCO	Includes freeriders	No DR programs offered	Tail rate for all 38 classes
Vectren	Includes both[78]	Yes	Tail, but most rate classes are only one block rate

---

[77] Based on I&M's use of net savings to calculate lost revenues, and spillover discussed in the calculation of the net to gross ratios for the Residential Home Energy Reporting Program and Online Energy Check up Program.

[78] Cause No. 43405 DSMA 9S1, Petitioner's Exhibit RCS-1 (Sears), Page 8, lines 18-19.

1   Q.   **Are there other inconsistencies in the utilities' calculation of lost revenues?**

2   A.   Yes. In addition to using different methodologies, the utilities do not appear to be

3   presenting the same information in their filings, nor are they presenting the

4   information in a uniform fashion. While I am aware that each utility is unique, the

5   Commission and interested stakeholders should be able to easily identify the

6   annual and total lost revenues each utility is requesting in each application as well

7   as the savings underlying those calculations. Under the current practice, this is

8   nearly impossible. As discussed in the Commission's recent order in Cause No.

9   44634:[79]

10   We note that the CAC also requested that the Commission initiate some
11   type of formal process to develop a standard methodology for Indiana
12   utilities to calculate lost revenues for an energy efficiency measure…we
13   fully expect that this issue will be addressed in that future rulemaking.
14

15   In November 2015, the Lawrence Berkeley National Lab ("LBNL")

16   answered this need by releasing a data tracking spreadsheet tool.[80] The tool is

17   simple to use and provides clear guidance for planned and actual program

18   spending and energy savings, lost revenues and performance incentives.

19   Furthermore, LBNL is available to provide technical assistance to states interested

20   in adopting the reporting tool, including assistance in customizing it to address

21   state-specific requirements.

---

[79] Cause No. 44634, IURC Order, page 39.
[80] https://emp.lbl.gov/sites/all/files/lbnl_energy_efficiency_reporting_tool_v._1.1.xlsx

1   Q.   **What is a reasonable approach to calculating lost revenues?**

2   A.   A reasonable approach would require that: (1) the utility show that

3   implementation of energy efficiency programs has prevented the Company from

4   recovery of authorized fixed costs; then (2) use a standard methodology across the

5   State of Indiana to determine how to uniformly calculate lost revenue for a

6   measure, and finally, (3) calculate the lost revenue for three years or the life of

7   measure, whichever is shorter.

8   I&M's current methodology for calculating lost revenues appears to be

9   unreasonable because it does not start with step one, determining if there are

10   actual lost revenues. In addition, it is unreasonable to request lost revenue for the

11   life of the measure or until the utility returns to the Commission for a rate case.

12   B.   **I&M'S REQUEST FOR RECOVERY OF LOST REVENUES FOR**

13   **THE LIFETIME OF AN EE MEASURE CREATES AN**

14   **EXPENSIVE PANCAKE EFFECT.**

15   Q.   **Did the Commission approve I&M's current lost revenue adjustment**

16   **mechanism methodology ("LRAM") indefinitely?**

17   A.   No. The Commission did not and, furthermore, the Commission's rules state that

18   it may periodically review the need for continued recovery of the lost revenue as a

19   result of the utility's DSM program, and that the approval of a lost revenue

20   recovery mechanism shall not constitute approval of a specific dollar amount, the

21   prudence, or reasonableness of which may be debated in a future proceeding

1   before the Commission.[81] Also, the newly enacted Senate Enrolled Act 412, in

2   Section (o), now includes the term "reasonable" in front of the term lost revenues.

3   **Q.**   **Have there been any policy changes since I&M's current lost revenue**

4   **methodology was approved in Cause No. 43827?**

5   **A.**   Yes. Subsequent to I&M's lost revenue methodology being approved in 2010,

6   Senate Bill 412 (2015) passed, even though I&M does not seem to be relying on

7   this statute here. Senate Enrolled Act 412's Section 10(o) states that if the

8   Commission finds a plan submitted by an electricity supplier under Section 10(h)

9   to be reasonable, which the Commission should not do here, the Commission

10   shall allow the electricity supplier to recover "[r]easonable lost revenues"

11   (emphasis added).   SEA 412 also directed the Commission to conduct

12   rulemakings, which implicate 170 IAC 4-7 "Guidelines for Electric Utility

13   Integrated Resource Plans" and 170 IAC 4-8 "Guidelines for Demand-Side Cost

14   Recovery by Electric Utilities."[82]

15   **Q.**   **What is the total amount of lost revenues that I&M is requesting in this**

16   **proceeding for the implementation of its 2016 Plan?**

17   **A.**   I&M is requesting $32.1 million. The $32.1 million includes legacy lost revenues

18   that I&M is requesting or receiving but does not include the total lost revenue cost

19   if I&M continues to be allowed to recover lost revenues for the life of the

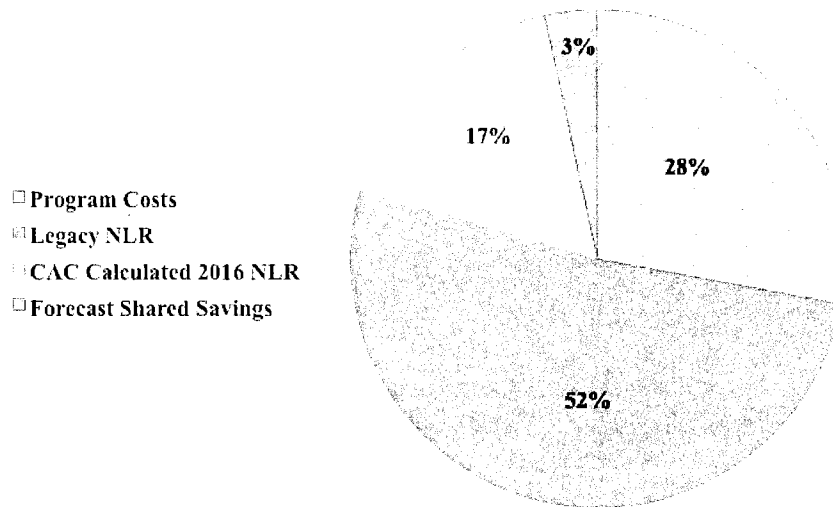20   measure. Also, as shown in Table 13, if the full year values for 2016 are

---

[81] 170 IAC 4-8-6 (c). Please note, however, that a rulemaking involving both 170 IAC 4-8 and 170 IAC 4-7 is currently underway in IURC RM # 15-06.

[82] Please note that CAC is requesting that the outcome of this proceeding be made subject to the outcome of IURC RM #2015-6.

1   calculated for lost revenues, I&M is requesting $9M as opposed to the filed half

2   year convention figure of $4.6M. This would bring the budget for 2016 to

3        $52.6M, about $7.7M more than I&M has in its application. Chart 3 and Table 13

4   below show the financial information that I&M provided in this application for its

5   2016 budget.

6   **Chart 3. I&M 2016 DSM Budget ($52.6M)**

- Program Costs
- Legacy NLR
- CAC Calculated 2016 NLR
- Forecast Shared Savings

3%
17%
28%
52%

7   **Table 13. I&M's Proposed 2016 Program Budget, Lost Revenue and Performance Incentive (million $)[83]**

	Residential	Commercial	Total
Program Cost	$8.5	$6.2	$14.7
Legacy Lost Revenue	$10.8	$16.3	$27.1
Forecast 2016 Lost Revenue (Full Year, CAC calculated)	$6.0	$3.0	$9.0
Shared Savings	$0.87	$0.91	$1.8
Total	$26.2	$26.4	$52.6

---

[83] I&M Witness Walter Testimony, Attachment JCW-10. Program cost includes EECO cost.

1   **Q.**   **Is it reasonable, in the public interest, or cost effective to allow I&M to**

2   **recover lost revenues for the life of a measure?**

3   **A.**   No. A reasonable lost revenue policy—assuming that the Company can show it

4   has actually lost revenues as a result of implementing energy efficiency

5   programs—would allow the utility to receive lost revenues for three years or the

6   life of the measure, whichever is shorter, which I discussed in the Section above.

7   As noted above, ACEEE labeled this scenario in which lost revenues for

8   the life of the measure accumulate over a multiple-year period between rate cases

9   as the "Pancake Effect" which is illustrated in Figure 3 below.[84]

10   **Figure 3. The Additive Nature of Lost Revenues Results in a Pancake Effect**
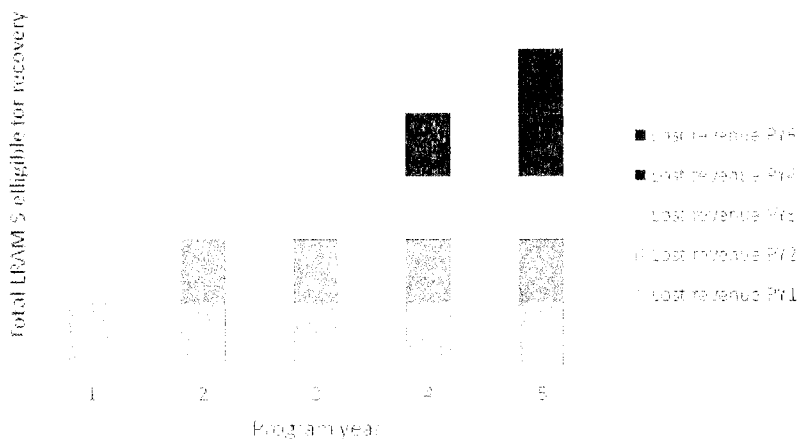
11   **Q.**   **Would it be prudent to allow Indiana utilities to recover lost revenue until**

12   **the utilities' next rate case?**

13   **A.**   No. As discussed in the Commission's recent order:

---

[84] ACEEE Review of Lost Revenue Adjustment Mechanisms, June 2015, page 12, Figure 7 (Exhibit NM-12).

1   Although we have previously approved lost revenues over a measure's life
2   or until a utility's next base rate case, whichever is shorter, Ms. Mims' and
3   other parties concerns with pancaking and the increased length of time
4   between base rate cases for utilities in Indiana raise a valid concern.[85]
5
6   Given the length of time between utility rate cases in Indiana, this could

7 result in the utility recovering lost revenue for the life of the measures, which as

8 discussed above is not reasonable. While I&M has conducted more frequent rate

9 cases than some of the other Indiana electric IOUs, as a statewide policy, allowing

10 utilities to recover lost revenues until there is a rate case is not prudent.[86] Even

11 with I&M's last rate case in February 2011,[87] future rate case dates have not been

12 established and there is no guarantee that the Company will return to the

13 Commission in five, ten or even twenty years for its next rate case.

14 Q.   **What are the financial impacts of allowing I&M to recover lost revenue for**

15   **the lifetime of the measure or until the next rate case?**

16 A.   I&M calculates its lost revenue by determining the annual net, verified kWh

17   impacts of each program, and multiplying the verified net kWh by the average

18   fixed cost per kWh for customers eligible for each program, based on I&M's

19   current rates.[88] The summed, or total year, net lost revenue is calculated from the

20   energy savings from all measures with remaining useful life for that program

21   year,[89] which can range from five years

---

[85] Cause No. 44634, IURC Order, page 38.
[86] ACEEE Review of Lost Revenue Adjustment Mechanisms, June 2015, page 12
(Exhibit NM-12).
[87] Cause No. 44075 (2013).
[88] Cause No. 44486, Testimony David Roush, page 5, lines 1-8.
[89] I&M Witness Walter Testimony, page 45, lines 19-21.

1   for a CFL lightbulb or fifteen to eighteen years for a LED lightbulb or HVAC

2   unit.[90]

3   In the absence of a rate case,[91] I&M will continue to add lost revenues

4   from prior years to existing years for energy efficiency measures that are still in

5   service, which ACEEE has dubbed the "Pancake Effect."[92] This can become very

6   expensive and dwarf the cost of the actual energy efficiency program

7   implementation. It means that the utility, if it does not return to the Commission

8   for a rate case, will recover lost revenues for the life of the measure.

9 Q. **What would happen if Commission adopted NIPSCO 4 year Net Lost**

10   **Revenue?**

11 A. I commend the Commission for shifting from lifetime net lost revenue recovery to

12   limiting lost revenues to four years. Due to the lack of granular data in the

13   application regarding the amount of net lost revenue associated with measures

14   that have a longer useful life than four years (and when those measures were

15   installed), I am not able to quantify the amount of savings this policy decision

16   would generate.

---

[90] I&M Discovery Request Response to CAC 01-02; I&M DSM 5 2015 Plan Exhibits
9_10_15 Attach Final.xls; 2016 Res. Home Energy Products Tab (Exhibit NM-13).
[91] I am aware that Senate Enrolled Act 560 (2013) states that "A public utility that
implements a TDSIC [Transmission, Distribution and Storage System Improvement
Charge] under this chapter shall, before the expiration of the public utility's approved
seven (7) year plan, petition the commission for review and approval of the public
utility's basic rates and charges with respect to the same type of utility service."
[92] ACEEE Review of Lost Revenue Adjustment Mechanisms, June 2015, pages 7, 11-13
(Exhibit NM-12).

1 Q. **Please summarize your lost revenue adjustment mechanism**

2   **recommendations.**

3 A. My recommendations for I&M's lost revenue recovery are: (1) the utility must

4   show that implementation of energy efficiency programs has prevented the

5   Company from recovery of authorized costs, then (2) it should use a standard

6   methodology across the State of Indiana to determine how to uniformly calculate

7   lost revenue for a measure, and finally (3) it should calculate the lost revenue for

8   three years or the life of measure, whichever is shorter. In addition, I&M and the

9   rest of the electric utilities in Indiana should be required to provide information in

10   a standard format regarding lost revenues, with the recent LBNL tool as a

11   fantastic option for clear reporting. The lack of data in the petition and direct

12   testimony is very concerning.

13 V. <u>**I&M'S PLAN IS NOT REASONABLE, IN THE PUBLIC INTEREST, OR**</u>

14   <u>**COST EFFECTIVE WITH ITS PROPOSED PERFORMANCE**</u>

15   <u>**INCENTIVE.**</u>

16 Q. **How did I&M's 2014 energy efficiency plan perform?**

17 A. I&M performed better than the third party administered programs by achieving

18   90% of their goal compared to Energizing Indiana achieving 81%, as shown in

19   Table 14. However, on average, the Company only met 86% of its total gross

1   kWh goal for 2014,[93] making it still eligible for a performance incentive of 15%

2   of all program costs.

3   **Table 14. I&M 2014 Energy Efficiency Program Performance**

Administrator	% of kWh Goal
Core Plus	
Appliance Recycling	127%
Online Energy Check-Up	75%
Home Energy Reporting Program	84%
Peak Reduction	N/A
RE Res Demo	23%
RE Com Demo	78%
Home Weatherization	41%
Residential New Construction	41%
Energy Efficient Products	41%
C&I Incentives	91%
C&I Audit	94%
C&I Small Business Direct Install	102%
C&I Retro-Commissioning Lite	103%
C&I HVAC Optimizer	20%
Res EECO	98%
Com EECO	98%
Subtotal	**90%**
Core Programs	
Home Energy Assessment	100%
Low Income Weatherization	100%
Residential Lighting	100%
Energy Efficient Schools Kits	93%
Energy Efficient Schools Audits	561%
C&I Rebate	68%
Subtotal	**81%**
Portfolio Total	**86%**

---

[93] I&M Discovery Request Response to CAC 4-01; I&M DSM/EE Program Scorecard EMV December (Exhibit NM-4).

1   **Q.**   **How is I&M's 2015 performance on meeting its energy efficiency goals?**

2   **A.**   Its 2015 performance appears to be going much worse than 2014. As of October

3   2015, the Company had only achieved 44% of its energy efficiency gross kWh

4   goal, and had spent 52% of its budget.[94]

5   **Q.**   **What is I&M's current performance incentive?**

6   **A.**   I&M's current performance incentive was approved as part of a settlement

7   agreement in Cause No. 44486.[95] Currently, I&M calculates its shared savings

8   incentive based on the net benefits calculated using the Utility Cost Test. The

9   Company first calculates 90% of the net benefits, and then is eligible to earn 15%

10   of the benefits. The incentive is capped at 15% of the sector (residential,

11   commercial and industrial) program costs. In the past, I&M was subject to a

12   threshold of achieving at least 50% of its energy efficiency goal before becoming

13   eligible for shared savings, but it does not appear that it has a threshold any

14   longer. The EECO program and any program that does not achieve a UCT score

15   of 1.0 (in this application, the Residential Peak Program and the Income Qualified

16   Weatherproofing) are not eligible for the shared savings incentive.

17   **Q.**   **Is their proposal for performance incentives reasonable?**

18   **A.**   No, it is not reasonable primarily because it is an incentive that is not based on

19   achieving any level of savings. If I&M saves one kilowatt-hour, it is eligible for a

20   "performance" incentive. As illustrated by I&M's 2014 energy efficiency

21   achievements, the Commission should establish a performance incentive that is

---

[94] I&M DSM/EE Program Scorecard October 2015 (Exhibit NM-3).
[95] Cause No 44486, Order of the Commission, approved December 03, 2014.

1   contingent upon a much higher performance, especially considering I&M's poor

2   2015 performance as reported so far.

3   Requiring a threshold, or a level of performance, to earn an incentive is

4   national best practice.[96] There are currently twelve states that have a shared net

5   benefits performance incentive, and of these twelve states, six of them require the

6   utility to achieve 70% of the energy savings goal to be eligible to receive the

7   incentive (Arkansas, Arizona, Colorado, Missouri, Oklahoma and Texas). Of the

8   remaining six, two require 50% of the energy savings goal (Georgia and

9   Minnesota), and four did not require an energy savings goal be met (North

10   Carolina, South Carolina and Kentucky) or provide information (Ohio). [97]

11   Given that I&M is setting its own energy efficiency goals, I recommend

12   that if the Commission approves a shared net benefit performance incentive, the

13   Commission require that I&M meet 100% of its goal as a threshold for a

14   performance incentive.

15   **Q.   Are performance incentives an effective tool to increase energy efficiency**

16   **adoption?**

17   **A.**   Yes. Performance incentives are part of the three-legged stool that supports

18   ratepayer funded energy efficiency: cost recovery, decoupling or a lost revenue

19   adjustment mechanism, and a performance incentive.

20   **Q.   What do you propose I&M use as the basis for their incentive?**

---

[96] ACEEE, Performance Incentive Review, 2015, page 7 (Exhibit NM-14).
[97] *Id.*

1   A.   I recommend that I&M use multiple performance metrics to define the

2   performance incentive, and cap the maximum amount of the incentive through at

3   financial incentive cap.

4   Q.   **What is a reasonable percentage of benefits that I&M should receive in a**

5   **performance incentive?**

6   A.   I&M is proposing to save ~0.77% of prior year retail sales each year in 2016.

7   There are currently 15 states that are achieving energy efficiency savings upwards

8   of one percent, and the leader is achieving more than three percent. Based on

9   ACEEE's State Scorecard, this level of efficiency would put I&M at about 19th,

10   if it were a state. This level of performance should not receive such a high shared

11   net benefit performance incentive.

12   Of the twelve states that currently have a shared net benefit performance

13   incentive, six of them have an incentive of 10% of the net benefits or less. The

14   other six have varying levels of performance incentives for achieving savings

15   goals. For example, in Colorado, utilities may receive 15% of net benefits if they

16   achieve 150% of their energy savings goal. Oklahoma allows 15% if the utility

17   achieves 80% of their energy savings goals. Duke Energy Carolinas and Duke

18   Energy Progress utilities receive 11.5% – 11.75% of the NPV of the net benefits

19   of the UCT as an incentive for energy efficiency impacts, and there is no

20   minimum savings required.

1   **Table 15.** Overview of Net Benefit Performance Incentives and
Energy Efficiency Savings[98]

State	Net benefit performance incentive level	Threshold requirement	State savings as a percent of sales
Arkansas	10%	80% of energy goal	0.53%
Arizona	6-8%	85% of goal	1.73%
Colorado	1% at 80% of goal Max 15% at 150% of goal	80% of goal	0.77%
Georgia	8.5%	50% of goal	0.23%
Kentucky	10-15%	None	0.37%
Minnesota	Up to 7 cents per first year kWh saved	At least 0.4% savings, or half of last five year average savings	1.22%
Missouri	4-6%	70% of goal	0.52%
North Carolina	11.5 -11.75%	None	0.64%
Ohio	No data	No data	0.89%
Oklahoma	15%	80% of goal	0.30%
South Carolina	6 – 11.75%	None	0.53%
Texas	Max 10%	100% of goal	0.20%

2   As I discussed above, performance incentives are a critical tool in energy

3   efficiency policy. However, as show in Table 15, the performance incentive does

4   not need to be extremely rich to motivate utilities to act, and in fact, the richest

5   incentives shown in Table 15, have the lowest statewide energy efficiency

6   savings.[99]

---

[98] ACEEE, Performance Incentive Review, 2015 (Exhibit NM-14).; Gilleo, Annie et al.
The 2014 State Energy Efficiency Scorecard. October 2014.
[99] Other policies besides performance incentives drive utility energy efficiency savings as
well. Several of the states with the highest energy efficiency impacts also have state
energy efficiency resource standards or comparable policies.

1   Based on this information, a lower net benefit percentage is more

2   appropriate for I&M. I suggest a tiered performance incentive, with a cap on the

3   total incentive level.

4 Q. **Should I&M receive a performance incentive if the lost revenue adjustment**

5   **mechanism is not revised?**

6 A. No, it would be my recommendation that in the absence of: (1) requiring the

7   utility to show that they have "lost" revenues; and (2) shortening the lost revenue

8   recovery period to the shorter of 36 months or the life of the measure, or requiring

9   the utility to return to the Commission for a rate case every three years, I&M

10   should not receive a performance incentive. However, if the lost revenue period is

11   shortened to 36 months or the life of the measure, whichever is shorter, the

12   Commission should allow a performance incentive.

13 Q. **Is I&M proposing to earn a performance incentive on its Residential Peak**

14   **Reduction Program?**

15 A. No. I&M is not proposing to recover performance incentives for four of its

16   programs: Income Qualified Weatherproofing, Residential Peak Reduction,

17   Residential EECO and C&I EECO.[100]

18 Q. **You mentioned crafting a performance incentive based on multiple**

19   **performance metrics. Can you expand on that idea?**

20 A. Yes. Based on recent research from the American Council for an Energy

21   Efficiency Economy, a performance incentive that considers multiple factors costs

---

[100] I&M Witness Walter Testimony, Attachment JCW-6.

1   the least as a percent of energy efficiency program costs and results in the highest

2   energy efficiency impacts.

3   I recommend that I&M's performance incentive be based off of the

4   Michigan Public Service Commission's use of an Financial Incentive Cap[101] and

5   six quantifiable Performance Metrics to determine the amount of the utility's

6   performance incentive, as shown in Table 16. The Financial Incentive Cap

7   determines the total maximum amount of incentive available to the utility each

8   year.

9   **Table 16. Consumers Energy Company 2016-2017 Incentive**
10   **Mechanism[102]**

Performance Metric	Description	Performance Requirements		Percentage of Financial Incentive Cap	
		Minimum	Maximum	Minimum	Maximum[103]
Lifetime Energy Savings	Lifetime MWh savings for exceeding 1.0% annual reduction	100.1% of lifetime	115% of lifetime	53%	80%
Low Income Programs	Energy savings from income qualified programs	100.1% of plan	115% of plan	4.40%	13.33%
Multi-Measure Residential	Increase number of residential participants who install three or more measures	16% increase in # of participants from 2015 and 2016	20% increase in # of participants from 2015 and 2016	2.20%	6.67%
Multi Measure	Increase number of	16% increase	20% increase	2.20%	6.67%

---

[101] The formula for Consumers Energy's maximum financial incentive is: if the portfolio UCT score is more than 1.6, the incentive is [(0.15/(UCT-1))*net benefits]; if the portfolio UCT score is less than 1.6, the incentive is [(0.25/UCT-1))*net benefits]. This total is multiplied by the respective Percentage Financial Incentive Cap in Table 16 for each of the metrics once the utility meets the Performance Requirements.

[102] Michigan Public Service Commission, Order Approving Settlement Agreement, Case No. U-1771. December 22, 2015. Available at http://efile.mpsc.state.mi.us/efile/docs/17771/0031.pdf.

[103] Financial incentive based on sliding scale between minimum and maximum caps. The actual percentage would be proportional to the Company's achievement in a particular metric. Total financial incentive is not to exceed 100% of the financial incentive cap.

C&I	business participants who install three or more measures	in # of participants from 2015 and 2016	in # of participants from 2015 and 2016		
Energy Star Benchmarking for Businesses	Provides business with benchmarking of building energy characteristics with ENERGY STAR portfolio manager	16% increase in # of participants from 2015 and 2016	20% increase in # of participants from 2015 and 2016	2.20%	6.67%
Business Energy Assessments	Energy Assessments for Small & Medium sized business customers	16% increase in # of participants from 2015 and 2016	20% increase in # of participants from 2015 and 2016	2.20%	6.67%

1   First, the Financial Incentive Cap is determined based on the formula in

2   footnote 94, and then the Performance Metrics in Table 16 are used to determine

3   the incentive Consumers Energy is eligible for each year. I recommend I&M's

4   Financial Incentive Cap be lower than Consumers Energy's because I&M is

5   achieving less savings, and is not being required to meet a statutory efficiency

6   goal, but instead is suggesting their own goal. Similar to Consumers Energy, I

7   suggest that if the overall portfolio UCT is lower, a higher Financial Incentive

8   Cap is appropriate to encourage the utility to pursue all cost-effective efficiency,

9   not just the most cost-effective efficiency.

10   Using a lower Financial Incentive Cap (10% instead of 15% in the formula

11   in footnote 94), and I&M's forecasted UCT of 2.69 for its portfolio, I&M's

12   Financial Incentive Cap would be $1.8M in 2016. This amount is very similar to

13   what the Company is requesting in this application. However, unlike what I&M is

14   proposing, under the Performance Metrics incentive I am suggesting, the

15   Company would have to achieve 100% of their energy savings goal to be eligible

1   for a significant portion of the incentive. Table 17 displays the outcome if I&M

2   achieves 100.1% of their energy savings goal and if they achieve less than 100%

3   of their energy savings goal.

4   **Table 17. Proposed I&M Financial Incentive**

Scenario 1: 100.1% of Energy Savings goal, meeting all other Performance Metrics at minimum level		
Performance Metric	% of Financial Incentive Cap	Incentive ($)
Lifetime Energy Savings	53%	$975,015
Low Income	4.4%	$80,944
Multi-Measure Residential	2.2%	$40,472
Multi Measure C&I	2.2%	$40,472
Energy Star Benchmarking for Businesses	2.2%	$40,472
Business Energy Assessments	2.2%	$40,472
Total	66.2%	$1,217,848
Scenario 2: Less than 100% of Energy Savings goal, meeting all other Performance Metrics at minimum level		
Lifetime Energy Savings	0%	$0
Low Income	4.4%	$80,944
Multi-Measure Residential	2.2%	$40,472
Multi Measure C&I	2.2%	$40,472
Energy Star Benchmarking for Businesses	2.2%	$40,472
Business Energy Assessments	2.2%	$40,472
Total	13.2%	$242,834

5

1   While using six discreet Performance Metrics to determine each utility's

2   performance incentive may seem overly complex, it could actually simplify the

3   process in Indiana because each utility would be held to the same standard.

4   Currently, each IOU electric DSM plan that I have reviewed has different

5   performance incentives, as shown in Table 18 below, which is arguably at least

6   equally complex and administratively burdensome to the IURC staff and

7   stakeholders.

Table 18. NIPSCO, DEI and Vectren Proposed
Performance Incentives Differ Significantly

	Description of Performance Incentive	Authority
Duke Energy Indiana	12% of actual program costs depending on performance; capped at 12% of 115% of budget.	Existing mechanism approved in Cause 43955 DSM 2
NIPSCO	None	Cause No. 44634, December 30, 2015 Order
Vectren	-4 to 10% of actual program costs depending on performance; capped at 10% of budget	Cause No. 43427 (original); Cause No. 44495 (current)
I&M	15% of 90% of UCT benefits, capped at 15% of program costs. No threshold for incentive.	Cause No. 44486, December 03, 2014 Order

8   Q.   **Is the issue of performance incentives in front of the Commission elsewhere?**

9   A.   Yes, performance incentives are part of the SEA 412 IRP/EE rulemaking, IURC

10   RM # 15-06. As part of this effort, I strongly recommend that a workshop be held

11   to discuss a cohesive state policy on performance incentives and calculation of

1   lost revenues, as these areas seem to have the most diverse methodologies among

2   Indiana utilities. In this workshop, I strongly recommend that the Commission

3   and stakeholders consider the costs and benefits of designing a performance

4   incentive that has multiple criteria, as well as identify appropriate criteria for a

5   three-year EE cycle that will motivate the utility to pursue Indiana's EE policy

6   goals.

7 Q. **Please summarize your performance incentive recommendations.**

8 A. My recommendations regarding I&M's proposed performance incentives are: (1)

9   performance incentives are a critical part of energy efficiency policy, but they

10   should only be provided for performance; (2) if the Commission chooses to

11   permit a performance incentive, it should require that I&M meet 100 percent of its

12   goal before allowing the Company to earn an incentive, and use multiple

13   performance metrics to determine I&M's performance incentive; and (3) I&M

14   should not be permitted to earn a performance incentive unless the lost revenue

15   recovery is limited to 36 months or the life of the measure, whichever is shorter.

16 VII. **I&M'S PLAN IS NOT REASONABLE OR IN THE PUBLIC INTEREST:**

17   **I&M'S MOST RECENT TRM AND EVALUATION, MEASUREMENT**

18   **AND VERIFICATION HAVE NOT BEEN INCORPORATED INTO THE**

19   **2016-2017 GOALS.**

20 Q. **What is the most recent EM&V that I&M has conducted?**

21 A. I&M completed Core and Core Plus Evaluation, Measurement and Verification in

22   2014, both of which were released in May 2015. I&M stated that they used

1   evaluated deemed savings provided by their EM&V vendor for 2014 programs in

2   the design of their 2016 programs.[104]

3   Q.   **What is I&M's proposed evaluation budget in relation to its overall budget**

4   **for 2016 (excluding lost revenues and performance incentives)?**

5   A.   I&M's forecasted EM&V cost is five percent of program budget,[105] although that

6   ranges from 3-10% by program. I&M did not present their forecasted EM&V data

7   in one exhibit, but rather it was spread across several exhibits, so it is compiled in

8   Table 19 below.

9   **Table 19. I&M proposed 2016 Program and EM&V Costs**

	Total Program Cost[106]	EM&V Costs[107]	EM&V as % of Total of Program Costs
Home Energy Products Lighting	$1,370,369	$50,000	4%
Home Energy Products Products	$325,942	$15,000	5%
Income Qualified Weatherproofing	$567,971	$ 55,000	10%
Schools Energy Education	$632,031	$25,000	4%
Home Appliance Recycling	$562,346	$35,000	6%
Home New Construction	$412,652	$35,000	8%
Home Weatherproofing	$574,442	$ 513,943	10%
Home Energy Online Checkup	$571,486	$40,000	7%
Home Energy Reports	$973,599	$35,000	5%
Residential Peak Reduction	$689,632	$35,000	5%

---

[104] I&M Witness Walter Testimony, page 44, lines 14-18.
[105] I&M Witness Walter Testimony, Attachment JCW-3, 2016 Program Tables.
[106] I&M Witness Walter Testimony, Attachment JCW-2, 2016 Plan. Excluding lost revenue and performance incentive.
[107] I&M Witness Walter Testimony, Attachment JCW-3; EECO costs are found in I&M Response to CAC 01-02, "WP 2016 EECO kWh Forecast" tab (Exhibit NM-15).

Home Comfort & Efficiency Pilot	$211,765	$20,000	9%
Work Prescriptive Rebate	$1,778,328	$97,547	5%
Work Custom Rebate	$3,442,741	$100,000	3%
Work Direct Install	$444,071	$40,000	9%
Small Business Efficiency Pilot	$196,320	$7,000	4%
EECO	$1,038,790	$75,000	5%
Total	$14,697,485	$719,547	5%

1   Similarly, I&M did not file its past year program budgets and EM&V in a

2 coherent format. In fact, there appear to be very different data for the same year in

3 the same spreadsheet supplied to CAC as shown in Table 20. For example for

4 I&M's 2014 data, in one tab, the sum of costs labeled as "EM&V" totals over

5 $600,000 and in another tab the sum of a cost labeled as "evaluation and related"

6 is $56,624 and in a third tab, $47,980. Data for 2015 is equally confusing. Perhaps

7 there is a simple explanation for these inconsistencies; however, I&M should

8 strive for more consistent and clear reporting.

9

10   **Table 20. Inconsistencies in I&M Program and EM&V Costs**

	Total Program Cost	EM&V Costs	EM&V as % of Total of Program Costs
2014[108]	$15,228,870	$654,898	4%
2014[109]	$15,228,870	$47,980	0%
2014[110]	$15,221,059	$56,624	0%

---

[108] I&M Discovery Request Response to CAC 01-02; "2014 Final Spend" Tab (Exhibit NM-16).

[109] I&M Discovery Request Response to CAC 01-02; "Attach JCW-7 2014 Final Perf." tab (Exhibit NM-17).

[110] I&M Discovery Request Response to CAC 01-02; "2014 Final Verified Savings" tab (Exhibit NM-18).

2015[111]	$13,877,733	$696,655	5%
2015[112]	$17,328,387	None provided	N/A
2015[113]	$17,035,271	None provided	N/A
2016	$14,697,485	$719,547	5%

1   Q.   **Is there anything else you wish to inform the Commission regarding EM&V?**

2   A.   The Commission should be aware that the Indiana-specific, ratepayer-funded

3   Technical Resource Manual (also known as Technical Reference Manual) was

4   updated this past summer.[114] The maintenance of documents such as these is

5   crucial to having a solid baseline for which to conduct EM&V in Indiana,

6   especially with the recently enacted federal Clean Power Plan.

7   Q.   **What are your EM&V recommendations?**

8   A.   I recommend that I&M refine their EM&V filings in future applications, and

9   strongly suggest that the Company file their EM&V costs in one exhibit, for all

10   programs.

---

[111] I&M Discovery Request Response to CAC 01-02; "EM&V Cost Per Program (Exhibit NM-19).
[112] I&M Discovery Request Response to CAC 01-02; "2015 Plan." (Exhibit NM-20).
[113] I&M DSM EE Program Scorecard October 2015 (Exhibit NM-3).
[114] Indiana Technical Resource Manual 2.2 (Exhibit NM-21).

1   IX.   <u>CONCLUSION AND RECOMMENDATIONS.</u>

2   Q.   **Please summarize your recommendations.**

3   A.   I recommend that the Commission reject I&M's plan in this Cause because it

4   cannot meet the requirements of the ARP statute, Ind. Code § 8-1-8.5-9, or Ind.

5   Code § 8-1-8.5-10(c) or (h) and furthermore, because even if it were reasonable

6   under these sections, it does not include reasonable financial incentives or lost

7   revenues.

8   In order to rectify these issues and present a plan that the Commission could

9   and should approve, I&M would have to:

10   1. Present a DSM plan that is consistent with an IRP that reasonably balances

11   energy resources through comparable consideration of both supply and

12   demand-side resources.

13   2. Pursue all reasonably achievable savings by increasing the goals for those

14   programs unaffected by opt-out customers to levels consistent with Action

15   Plan, and spending entire DSM budget.

16   3. Modify new construction and low income programs, re-evaluate if the

17   Neighborhood Energy and Moderate Income are appropriate programs to

18   offer, and provide an explanation if the Company finds they are not

19   appropriate, offer a program for multifamily homes, new manufactured

20   homes, direct install for schools, and non-residential self-direct programs, and

21   modify its opt-out letter to include details on the benefits of EE.

22   4. Require I&M's Oversight Board guidance return to the pre-Settlement

23   oversight requirements.

1   5. Demonstrate that it is experiencing lost revenues and then limit lost revenue

2   recovery to 36 months or the life of the measure, whichever is shorter.

3   6. Include a performance incentive that is based on multiple performance metrics

4   and subject to financial cap. A performance incentive should only be proposed

5   if lost revenue recovery is limited to 36 months or the life of the measure,

6   whichever is shorter.

7   7. File clear EM&V in all future DSM proceedings.

8   **Q.   Does this conclude your testimony?**

9   **A.**   Yes.

VERIFICATION

I, Natalie A. Mims, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

Natalie Mims   January 13, 2016

Natalie A. Mims   Date

Exhibit NM-1
Resume of Natalie A. Mims

NATALIE A. MIMS

1035 Santa Barbara St, Suite 9
Santa Barbara, CA 93101

808-987-0389
mimsconsultllc@gmail.com

RELEVANT WORK EXPERIENCE

MIMS CONSULTING, LLC
Principal, April 2015 - current

SOUTHERN ALLIANCE FOR CLEAN ENERGY
Energy Efficiency Director, January 2013 - current
Earlier position: Energy Policy Manager, October 2010– December 2012
- Testifies as expert witness before the Public Service Commissions on energy efficiency cost recovery, program plans and financial incentive mechanisms in Georgia, North Carolina and South Carolina
- Responsible for ongoing energy efficiency portfolio and program level quantitative and qualitative research and analysis of major utilities in the Southeast
- Track and participate in energy efficiency regulatory proceedings. Current regulatory proceedings include IRP, cost-recovery filings, energy efficiency program pilots and existing program modifications
- Responsible for reviewing and writing comments and/or testimony for all major energy efficiency regulatory proceedings for utilities in Tennessee, North and South Carolina, Georgia and Florida
- Responsible for managing energy efficiency staff and establishing and implementing efficiency strategy for the SACE
- Assists in development/fundraising to ensure energy efficiency work funded in upcoming years
- Lead participant for SACE at TVA, Duke Energy and Georgia Power energy efficiency working groups

ROCKY MOUNTAIN INSTITUTE
Senior Consultant, July 2009 – October 2010
Earlier positions: Intern, Fellow, Analyst, and Consultant October 2004- July 2009
- Project manager for nine-person team creating energy efficiency component of national analysis to eliminate US fossil fuel consumption by 2050
- Project manager for company-wide energy efficiency strategy and development
- Lead on energy efficiency analysis for major southeastern IOU low-carbon strategy
- Lead author on published national analysis on electric productivity
- Member of senior leadership of Energy and Resources Team at the organization. Contributed to team strategy, resource planning and staffing for 12-20 person team and hiring as well as organizational professional development strategy
- Contributed to writing Hawaii Energy Strategy 2007 and planning Hawaii Biofuels Summit Contributed to RMI filings in Energy Efficiency docket before Hawaii Public Utility Commission
- Participated in Hawaii Energy Policy Forum Energy Efficiency working group
- Significant contributor to consulting and research projects including: national and state energy policies, utility revenue adjustment mechanisms, utility regulatory structures, private sector investment in energy efficiency, corporate carbon management strategy, renewable energy market assessments, large and small scale sustainable development projects, Hawaii agricultural sustainability barriers and solutions

PUBLICATIONS

- Legislative Options to Improve Transportation Efficiency. November 2005, RMI.
- Feebates: A Legislative Option to Encourage Continuous Improvements to Automobile Efficiency. February 2008, RMI.

- Plug-In Hybrid Electric Vehicles and Environmentally Beneficial Load Building: Implications on California's Revenue Adjustment Mechanism, Presented at Association of Energy Service Professionals Conference, January 2008.
- Industrial Electric Productivity: Myths, Barriers, & Solutions. Presented at ACEEE Industrial Summer Study, July 2008.
- Assessing the Electric Productivity Gap and the U.S. Efficiency Opportunity. Presented at IEPEC, August 2009.

EDUCATION

MASTER OF ENVIRONMENTAL LAW & POLICY
Vermont Law School, South Royalton, Vermont
August 2004
- Relevant coursework includes: Environmental Justice, Environmental Law, Land Use, Water Law, Federal Natural Resource Law, Comparative Methods of Dispute Resolution, Environmental Law Principles, Extinction: The Endangered Species Act, Legal Research & Writing, Ecology
- Activities: Solutions Conference 2004

B.A. ENGLISH & B.A POLITICAL SCIENCE
The Pennsylvania State University, State College, Pennsylvania
May 2002
- Honors: Blue & White Scholarship; Dean's List five semesters; National Collegiate Honor Scholar
- Relevant coursework includes: Economics, Social & Developmental Psychology
- Activities: Shaver's Creek Outdoor School Camp Counselor, May 2001

COMMUNITY SERVICE

SECRETARY, SANTA BARBARA COUNTY SURF CLUB

BOARD MEMBER, VERMONT LAW SCHOOL ALUMNI ASSOCIATION

Exhibit NM-2

I&M Discovery Request Response to CAC Set 1, Q6
Updated Action Plan

Updated Action Plan for Electric Demand Side Management (DSM) Programs:

Final Report

Prepared for:
Indiana Michigan Power Company
Fort Wayne, Indiana

Prepared by:
H. Gil Peach & Associates LLC
Jai J. Mitchell Analytics
Forefront Economics Inc.

with contributions from:

H. Gil Peach
John Mitchell
Mark E. Thompson
Howard Reichmuth

March 14, 2013

Vision Statement

To be a world leader in developing truthful measurement and useful results; to support development of efficient, ethical, and effective practices, sustained economically, to advance human development.

Goals Statement

- Excellence in the integration of knowledge, method, and practice Improvement and learning at all levels

- Contextually sound measurement, analysis, and reporting Anticipate and meet the needs of our clients

- Awareness of human relevance and of the ethical core of research

- To go further, to find better ways

Mission Statement

With extensive experience in North America, together we can provide the full range of management, planning, and evaluation services – wherever and whenever there is a need.

Website www.scanamerica.net

H. GIL PEACH & ASSOCIATES   EIN: 93-323715

Contact: H. Gil Peach, Ph.D. hgilpeach@scanamerica.net
16232 NW Oakhills Drive
Beaverton, Oregon 97006-5242 USA
Telephone: (503) 645-0716

Table of Contents

Figures

Tables

Updated Action Plan for Electric Demand Side Management (DSM) Programs:

Final Report

Portfolio Level Overview

This document presents a three-year demand side management (DSM) program action plan for residential and non-residential electric customers in the Indiana portion of the Indiana Michigan Power Company service area, referred to in this report as I&M-Indiana (I&M). This report was prepared by H. Gil Peach & Associates, Jai J. Mitchell Analytics and Forefront Economics Inc with consultation and review by the I&M DSM staff and the Oversight Board. The design and cost effectiveness of electric DSM programs are addressed in this report. In this first section the focus is on the program portfolio.

The overall portfolio parameters are summarized in Tables 1 and 2. The portfolio Total Resource Cost Test (TRC) is 2.3 with a weighted life of 12.4 years (Table 1). The profile of portfolio costs and benefits is shown in Table 2.

Table 1: Portfolio TRC and Life.

Portfolio TRC	2.3
Weighted life (Years)	12.4

Table 2: Portfolio Benefit and Cost Profile.

Portfolio Level	Dollars (Thousands)
Net Benefits	$ 379,852
Net Costs	$ 160,017
Umbrella DSM Program Costs	$ 3,396
Net Present Value	$ 216,439
Annual Net Benefits	$ 24,633

The overall portfolio table values can also be shown with specific program bundles according to sector or status within the statewide effort. The specific program bundle breakouts are shown below.

Table 3: Breakout Benefit/Cost Analysis

	C&I	Residential	Core	Core Plus
Net Benefits	$ 234,955	$ 144,897	$ 143,505	$ 236,347
Net Costs	$ 63,631	$ 93,386	$ 62,540	$ 97,476
Umbrella DSM Program Costs	$ 1,228	$ 2,168	$ 1,263	$ 2,132
Net Present Value	$ 170,096	$ 46,343	$ 79,701	$ 136,738

Within the Overall Portfolio:

- The Overall Commercial & Industrial TRC is 3.5
- The Overall Residential TRC is 1.5
- The CORE TRC is 2.2
- The CORE Plus TRC is 2.4

Special Budget Items at the Portfolio Level

The portfolio budget contains certain portfolio level expenses (budget lines) that are not assigned to specific program budgets (or included in the program level Total Resource Cost calculations) but operate at the overall portfolio level (Table 4).[1]

Table 4: Annual Portfolio Level DSM Expenses.

Line No.	Budget Line Item	Amount ($)
1	Information technology and systems	$ 150,000
2	Staff development & memberships	$ 120,000
3	New Program Development	$ 210,000
4	General energy efficiency management and collaboration	$ 140,000
5	Codes work	$ 100,000
6	MPS and Action Plan	$ 100,000
7	DSM Marketing and Customer Awareness	$ 300,000
8	Evaluation and Related	$ 140,000
	Total	$ 1,260,000

---

[1] The special portfolio level budget items are included in the calculation of the overall portfolio level TRC.

2

These line items either apply across all programs (regardless of the specific inclusion or exclusion of individual programs), or provide start-up funding for an area that is not ready to be formulated as a program in this program cycle (codes work). The first item supports the tracking system and other computer systems. The second supports staff development, participation in industry conferences and membership organizations and training. The third is a pool to draw on each year to support new program development (NPD). This permits drawing upon resources of AEP that are outside I&M's DSM staff. The fourth is funding for one staff member outside the actual program level budgets to support a "point position" for participation in statewide meetings and common efforts. The fifth item is to permit work on codes, which will require development over the new program cycle. We could not put this activity in as a specific DSM program because we could not figure a way to assign savings at this stage: it needs to be tested as an ongoing pilot for three to five years and part of the pilot will be developing a mutually agreed link between codes work and energy savings results with regulators.[2] The sixth item is to fund the next full scale potential study and program action plan and/or to provide supplementary support in this area moving forward. The seventh, "DSM Marketing and Customer Awareness" is a general marketing and communications budget separate from the line items in the individual program budgets. The eighth line item covers an in-house position for evaluation and related functions separate from the individual program budgets.

The extra first year costs in the individual program budgets have been deleted and instead there is an annual cost adder for each program budget.

Staffing

The recommended staffing level if all programs are implemented is 10 positions. Two of these are covered (Line Items 4 and 8) in the Overall Portfolio budget. The other 8 are in the individual program budgets.

Summary of Program Level TRCs

The individual programs with their Total Resource Cost (TRC) results are as follows (the portfolio level budget items have been loaded on the portfolio TRC but not on the individual program TRCs):

---

[2] Codes work for Indiana will have been specially developed for Indiana. Guidance from other states can found in the presentations at the MEEA Midwest Regional Codes Conference (http://www.mwalliance.org/policy/midwest-regional-energy-codes-conference). Codes work is carried in various states but varies considerably depending on specific codes legislation, existing staffing and training for codes enforcement, whether code enforcement is a state or county responsibility and the degree to which the energy-efficiency parts of codes are enforced.

- **Demand Programs:** C&I Peak Reduction (2.7); Residential Peak Reduction (1.5);

- **R&D:** Renewables & Demonstrations (0.3);

- **Commercial & Industrial Programs:** C&I Custom (10.9); C&I Rebates (2.8); C&I Retrocommissioning Lite (5.0); C&I HVAC and Refrigeration Optimization (1.2); C&I Audit (1.3); Energy Efficient Schools – Audit (0.4)

- **Residential Audit Programs:** Residential On-Site Audit (1.9); Residential On-Line Audit (1.0);

- **Weatherization Programs:** Residential Weatherization – Regular Income (1.5); Residential Moderate Income Qualified Weatherization (1.5); Residential Low Income Qualified Weatherization (0.6) – because we added money for Health and Safety items that belong in this program type; Residential Neighborhoods (1.6);

- **Other Residential:** Residential EE Products (1.5); Residential Home Reports (0.8) – due to the one year measure life and the PJM numbers; Energy Efficient Schools - Education (1.8); Residential New Construction (1.5); Residential Appliance Recycle (1.3); Residential Lighting (2.2)

- **Codes:** Not TRC tested – to be developed as a pilot over 3-5 years, and then converted to a program. Specific cost categories and estimation of costs will need to be developed as part of the project.

The Programs

The programs are outlined individually in this section of the report. Each program is briefly discussed in terms of:

- Rationale
- Participation & Measures
- Marketing Plan
- Program Tracking
- Budget Assumptions

The program descriptions are planning projections that can be considered initial program designs. The real program designs will be more complex and will evolve from I&M internal planning, the Oversight Board and work with program vendors on final design. Also, the operative design for each program implemented will be emergent from actual practice. Planning requires a certain linearity of thinking for use in making projections to future years. In contrast, in the direct experience of implementation each program is its own unique totality and will encounter realities that require interaction and adjustment. For this practical reason, we advocate the model of the "free administrator," [3] so that each program manager is seen as implementing a program objective but is free (with I&M and OSB review) to modify the program as it moves forward to achieve goals. The program is progressively modified to make it more relevant, efficient and effective. Just as the Technical Resource Manual (TRM) is meant to be a "living document," the programs here are understood to initial designs for "living programs" which will require improvements as they venture out into full implementation in the material world. The nature of these improvements will only be discoverable in the action of implementation.

This plan advocates 21 programs plus new program development in the codes area. The programs cover the Residential and Commercial & Industrial areas, and include both Core and Core Plus programs.[4] Planned program percentage savings are shown in Figure 1 and Table 5.

---

[3] The "free administrator" is Donald Campbell's "experimental administrator": *"Experimental administrators* have justified the reform on the basis of the importance of the problem, not the certainty of their answer, and are committed to going on to other potential solutions if the first tried fails." Campbell, Donald T., "Reforms as Experiments," Pp. 7 1-100 in E.L. Streuening and M. Guttentag (eds.), *Handbook of Evaluation Research (Vol. 1)*. Beverly Hills, California: Sage, 1975. In Campbell's perspective a program is a "reform."

[4] In Indiana, Core programs are run statewide by a single program vendor; Core Plus programs are run by individual utilities. For both Core and Core Plus programs, the Oversight Board (OSB) plays a role in the final shaping of the programs and in the selection of program vendors along with the utilities.
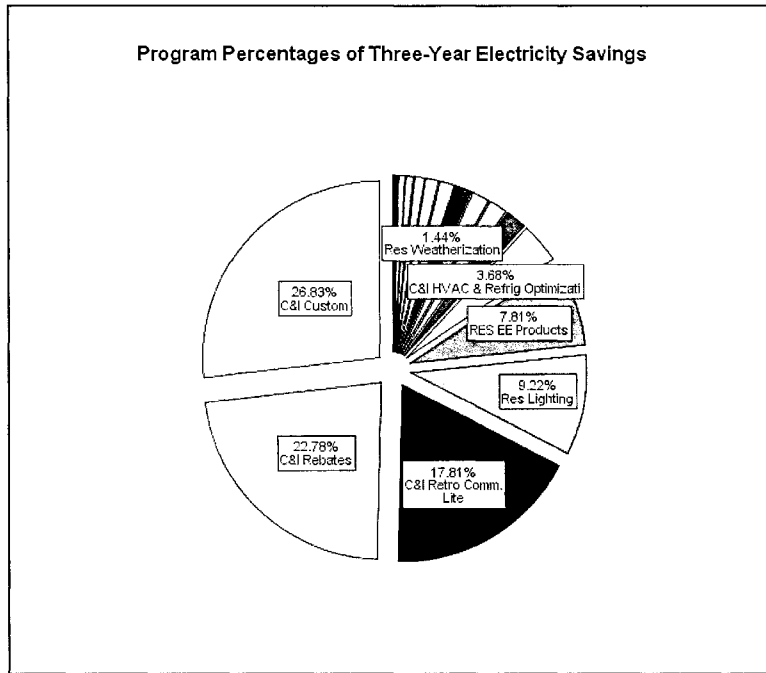
Figure 1: Planned Three-Year Savings (Percentages).

Table 5: Program Savings as Percentage of 3-Year kWh Savings.

Program	3-Year Cumulative kWh	% of Portfolio
C&I Custom	315,288,244	26.83%
C&I Rebates	267,731,772	22.78%
C&I Retro Comm. Lite	209,288,916	17.81%
Res Lighting	108,324,256	9.22%
RES EE Products	91,727,316	7.81%
C&I HVAC & Refrig Optimization	43,273,440	3.68%
Residential Home Report	22,552,050	1.92%
Res Appliance Recycle	19,811,715	1.69%
Moderate Income	18,925,036	1.61%
Res Weatherization	16,969,815	1.44%
Res On-Site Audit	16,257,330	1.38%
Income Qualified Weatherization	13,722,360	1.17%
Energy Efficient Schools - Education	10,385,244	0.88%
C&I Audit	9,056,691	0.77%
Residential Neighborhoods	6,498,701	0.55%
Res Online Audit	2,688,696	0.23%
Res New Construction	1,980,118	0.17%
Enegy Efficient Schools - Schools	614,080	0.05%
Renewables & Demonstration	107,370	0.01%
Portfolio	1,175,203,150	100.00%

Program 1: Commercial and Industrial Peak Reduction (CORE PLUS)

This program involves providing an AC cycling peak reduction measure to a wider market of small and medium-sized commercial customers as a load reduction program focused on air conditioners. It is not assumed that the program is functioning within a "smart grid" and while we recommend consideration of two-way meters for immediacy of certain verification, we assume a one-way signal with the use of meters with memory that may be queried on-site.

Rationale

Load (kW) constraints are one of the most costly events a utility encounters. During peak times when demand escalates and there is a problem with meeting demand with additional generation supply (either physically or at reasonable cost), the cost per kW to the company can escalate exponentially. For this reason, in these situations load control is essential to control costs and insure service.

Participation and Measures

Measures are shown below, followed by participation projections.

Table 6: Measures – C & I Peak Reduction

Measures
Load Control – AC Cycling

Table 7: Participation and Savings -- C&I Peak Reduction

Commercial and Industrial Peak Reduction				
Potential participants				10,290
Per participant savings (kWh):				0
Per participant savings (kW):				9.5
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	515	5.0%	0	4,910
2015	617	6.0%	0	5,882
2016	720	7.0%	0	6,864
Average	617	6.0%	0	5,885

Marketing Plans

The Marketing and Promotional Plan should include mention of the program in any communications with appropriate customers regarding energy efficiency program options and on the Company website. Additional promotion may include bill inserts and recognition window stickers for participating businesses. Customers with account representatives should be contacted through the account representatives. However, since utilities typically have fewer staff (and staff have many more responsibilities) than in the past, it may be that the most effective marketing will be through the selected program delivery agent.

The small and medium sized commercial class is not expected to be easy to enlist. Generally, these customers will be concerned about the effects of the cycling on clients (sales) and staff. It is expected that this program may cause a temperature fluctuation of about 2 degrees. If this can be communicated or demonstrated it may ease fears about effects on customers or production. The small commercial class is usually not assigned account representatives, so this will be a limiting factor in communications. The issue of owner-occupied versus tenant-occupied space will also be a challenge in promoting participation in this program. The marketing and promotion effort will give priority to owner-occupied facilities.

Program Tracking Considerations

Direct load control is data intensive and load management data is precise. When load events are called either for capacity shortages or economic emergencies, the systems self-validate. Care needs to be taken to insure the collection of data elements sufficient to show the baseline condition at the time an event is called and the response to the call as a kW effect. The duration of each event for evaluation purposes should also last long enough to show the affected units back on line to demonstrate there are no unexpected rebound effects.

Budget Assumptions

The anticipated cost to I&M for offering the medium/small commercial AC cycling component to customers involves budgets for a monthly participant incentive and payment when events are responded to. Cost to the participants is to accept the temporary load control when incidents are called.

Table 8: Estimated Three-Year Program Budget - C&I Peak Reduction

C&I Peak Reduction	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Program Costs						
Implementation & Other Annual Cost		$50,000	$50,000	$50,000	$150,000	2%
DSM Staffing		$104,794	$108,462	$112,256	$325,511	4%
Monitoring & Evaluation		$40,000	$40,000	$40,000	$120,000	2%
Variable Program Costs						
Annual Incentives	$80	$41,200	$90,560	$148,160	$279,920	4%
Delivery & Other	$3,626	$1,867,390	$2,237,242	$2,610,720	$6,715,352	88%
Total Budget		$2,103,384	$2,526,264	$2,961,136	$7,590,783	100%

Program 2: Residential Peak Reduction (CORE PLUS)

A load control program is a dispatch program. In a dispatch program, a switch can be engaged to send a signal which directly reduces load. Direct load control is an important approach to peak reduction because it offers low cost to the company and is dispatchable.

Rationale

Load (KW) constraints are one of the most costly events a utility encounters. During peak times when demand escalates and there is a problem with meeting demand with additional generation supply (either physically or at reasonable cost), the cost per kW to the company can escalate exponentially. For this reason, in these situations load control is essential to control costs and insure service.

Participation and Measures

Measures are shown below.

Table 9: Measures – Residential Peak Reduction

Measures
DLC – Residential AC

Projected participation by year is shown in the table below.

Table 10: Estimated Participation and Savings - Residential Peak Reduction

Residential Peak Reduction				
Potential participants				234,850
Per participant savings (kWh):				0
Per participant savings (kW):				0.9
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	11,743	5.0%	-	10,686
2015	14,091	6.0%	-	12,823
2016	16,440	7.0%	-	14,960
Average	14,091	6.0%	-	12,823

Marketing Plans

Marketing should take advantage of current concerns for mitigating climate problems by emphasizing a green marketing theme and can include the following elements:

- Proposed marketing efforts are to include mention of the program in any communications with customers regarding energy efficiency program options such as bill inserts, recognition window stickers for participating homes, media coverage of how to manage electric bills, customer service representatives, and promotion using the I&M website.

- Residential communications for the program can reach out to customers with high bill complaints and to customers with payment problems as well as to general promotion to customers concerned with keeping costs low and interested in mitigating global warming.

Program Tracking Considerations

Direct load control is data intensive and load management data is precise. When load events are called either for capacity shortages or as tests, the systems self-validate. Care needs to be taken to insure the collection of data elements sufficient to show the baseline condition at the time an event is called and the response to the call as a kW effect. The duration of each event for evaluation purposes should also last long enough to show the affected units back on line to demonstrate there are no unexpected effects.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. Cost to the participants is to accept the temporary load control when incidents are called.

Table 11: Estimated Three-Year Program Budget – Residential Peak Reduction

Res Peak Reduction	Cost/ Participant	2014	2015	2016	3-Yr Total	Percent of Total
Fixed Program Costs						
Implementation & Other Annual Cost		$30,000	$30,000	$30,000	$90,000	0%
DSM Staffing		$104,794	$108,462	$112,256	$325,511	2%
Program Monitoring & Evaluation		$100,000	$100,000	$100,000	$300,000	1%
Variable Program Costs						
Incentives	$40	$469,720	$1,033,360	$1,690,960	$3,194,040	14%
Delivery & Other	$460	$5,401,780	$6,481,860	$7,562,400	$19,446,040	83%
Total Budget		$6,106,294	$7,753,682	$9,495,616	$23,355,591	100%

Program 3. Renewables and Demonstrations (CORE PLUS)

This program contains five program elements: Solar photovoltaic, solar hot water, ground source heat pumps, LED streetlights, and the "Go Deep" project. This program is open to new technologies as they become feasible. Each of these program elements is currently borderline cost-effective. Together, the set is not cost-effective. However, this program in included as a recommended program for three reasons. First, it is a source for a small number of technology demonstration projects that can be used for promoting interest in energy efficiency. This can include a small number of solar demonstration projects at schools, a ground source heat pump demonstration and sponsoring a few homes for the "Go Deep" project. In addition, LED streetlights are now fully available and will likely become a recommended program measure in future years.

Since most people are interested in "Green" programs, these examples will fit with and encourage this interest. Second, each of the demonstrations is at the edge of current technology in its area. This will keep key company staff current in solar, ground source, and "Go Deep" technologies. Third, each of these has sufficient scale possibilities that make them sufficiently powerful to address climate change and, at the same time, running these demonstrations will place the company in with companies in a leadership role in developing these technologies.

Rationale

Each of these program elements push technology beyond current cost-effective limits, but, at the same time, present coherent pathways towards the future of energy efficiency applications. The "Go Deep" project is based on a German model using a "passive house" strategy. The goal is to reduce energy use by eighty percent in existing homes. The principles of this approach include tight super-insulated homes with a thick building envelope and high performance windows and doors. According to the organizer of the "Go Deep" project, Linda Wigington, "Our housing is facing a crisis of obsolescence, and we have a lion share of existing houses that need to be dealt with to reduce energy in the near term." In this approach structure and appliances are parts of the solution as is "how a family lives in a house." "Go Deep" is a national project in which individual utilities sponsor a small number of homes in the 1,000 home pilot. Early results suggest that attaining the savings goal is possible, and the focus is on system replacements and increasing efficiencies.

Participation and Measures

Measures are shown below.

Table 12: Measures and Incentives – Renewables and Demonstrations

Measure/Program Element	Measure Number	Incentive Amount
Solar PV	Demo	100%
Solar Hot Water	Demo	100%
Ground Source Heat Pump	Demo	100%
Go Deep	Demo	100%
LED Streetlights	Demo	100%

Because this is a promotional and R&D program there will be only a very small number of projects each year.

Table 13: Estimated Participation and Savings - Renewables and Demonstrations

Renewables & Demonstration				
Potential participants				10,000
Per participant savings (kWh):				3,579
Per participant savings (kW):				1.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	5	0.1%	17,895	6
2015	5	0.1%	17,895	6
2016	5	0.1%	17,895	6
Average	5	0.1%	17,895	6

Marketing Plans

These projects will be used to create interest in energy efficiency through public demonstration projects and to provide referrals to the other programs.

Program Tracking Considerations

Since these are demonstration programs data collection will focus on technical documentation of each project.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 14: Estimated Three-Year Program Budget - Renewables and Demonstrations

Renewables & Demonstrations	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Program Costs						
Implementation & Other Annual Cost		$25,000	$25,000	$25,000	$75,000	12%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	17%
Program Monitoring & Evaluation		$75,000	$75,000	$75,000	$225,000	36%
Variable Program Costs						
Incentives (paid annually to participants)	$7,590	$37,950	$37,950	$37,950	$113,850	18%
Delivery & Other	$7,000	$35,000	$35,000	$35,000	$105,000	17%
Total Budget		$207,881	$209,104	$210,369	$627,354	100%

Program 4. Commercial and Industrial Rebates (CORE)

This program targets non-residential customers eligible for prescriptive measures. These will include commercial, industrial, and institutional customers. For-profit, non-profit and public agencies (such as schools) will be included.

Rationale

Rebates are straightforward reimbursements of a portion of customer cost of specific rebated energy efficiency items. Many customers have concerns about the high first cost associated with some of the larger energy efficiency investments (e.g. HVAC systems or energy management systems). The incentives proposed will help remove that barrier.

Participation and Measures

Representative measures are shown in the table below. Measures may be added or deleted from the prescriptive list as information is gained during program planning and administration.

Table 15: Measures and Incentives – C&I Rebates

Measures	Measure Number	Incentive
Window Film	C-7	50%
Efficient Package Refrigeration	C-9	50%
Electronically Commutated Motors	C-10	50%
Premium Motors	C-11	50%
Single Application VFD	C-13	50%
Energy Star Transformers	C-14	50%
New Efficient Lighting Equipment	C-17	50%
Retrofit Efficient Lighting Equipment	C-18	50%
LED Exit Signs	C-19	50%
LED Traffic Lights	C-20	50%
Low Flow Fixtures	C-23	50%
Vending Miser and Vending Machine Timers	C-14b	50%

An offering of energy efficient products is a traditional role that customers expect from utilities. And, we know that customers tend to trust utilities above other entities in this specialized area. We expect this program to easily communicate to customers and to have substantial participation from the first year. It is important to note that unlike most other programs, participants may

return repeatedly to this program to purchase additional products. Projected participation by year is shown in the table below.

Table 16: Estimated Participation and Savings - C&I Rebates

C&I Rebates				
Potential Participants				42,400
Per participant Savings (kWh):				25,564
Per Participant Savings (kW):				4.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,696	4.0%	43,356,544	6,879
2015	1,781	4.2%	45,529,484	7,224
2016	1,823	4.3%	46,603,172	7,394
Average	1,767	4.2%	5,163,067	7,166

Marketing Plans

This program will need to be continually advertised during its operations. We recommend some general advertising in the form of brochures and mailings targeted to potential program participants. I&M should work directly with business associations and contact some customers through account representatives.

Program Tracking Considerations

The program manager should insure that the vendor managing this program has an excellent tracking system and provision should be made to gather in-service date and technical data about equipment being replaced as well as the energy savings measures that will replace old equipment.

Detailed Budget Plans

An estimated three-year budget for the Commercial and Institutional Rebate Program is provided below. Costs to participating customers include the remainder of equipment and installation costs.

Table 17: Estimated Three-Year Program Budget – C&I Rebates

C&I Rebates	Cost per Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$50,000	$50,000	$50,000	$150,000	1%
DSM Staffing		$104,794	$108,462	$112,256	$325,511	1%
Monitoring & Evaluation		$120,000	$120,000	$120,000	$360,000	1%
Variable Costs						
Annual Incentives	$4,520	$7,665,920	$8,050,120	$8,239,960	$23,956,000	94%
Delivery & Other	$130	$220,480	$231,530	$236,990	$689,000	3%
Total Budget		$8,161,194	$8,560,112	$8,759,206	$25,480,511	100%

Program 5. Energy Efficient Schools – Audit (CORE)

The program is available to public and private schools in the service territory. The school energy use analysis and audit component of the Energy Efficient Schools Program will provide building walkthrough energy audits for school buildings. All K-12 schools that are greater than 10 years old will be eligible for an energy audit. Information on the age of buildings will be self-reported by the school districts on the audit application. The objective of the school audits is to educate school officials on the benefits of energy efficiency and the savings associated with the installation of recommended energy saving measures and operational improvements to their schools.

Rationale

The state education system is a critical activity with limited resources. The effort to increase efficiency in schools will lead to the use of resources towards a more rational allocation. Additionally, the implementation of energy efficient measures will lead to increased quality of lighting and comfort within the learning environment. There is significant potential energy savings within the education system.

Participation and Measures

Measures are shown in the table below, and may be added or subtracted during the program based on experience.

Table 18: Measures and Incentives – Residential Energy Efficient Schools - Audit

Measures – Kit Items	Measure Number	Incentive
Efficient Residential Lighting	R-11	100%
Lighting Controls	C-18	100%
LED Exit Signs	C-19	100%
Vending Machine Timers	C-31	100%
7-Plug Smart Strips	RC-1	100%

Table 19: Estimated Participation and Savings – Energy Efficient Schools – Audit

Energy Efficient Schools - Audit				
Potential Participants				320
Per participant Savings (kWh):				7,676
Per Participant Savings (kW):				2.0
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	12	3.6%	92,112	24
2015	14	4.5%	107,464	28
2016	16	5.0%	122,816	32
Average	14	4.4%	107,464	28

Marketing Plans

The school audit program will be one of two programs that will be rolled out to the school districts, using a number of marketing channels including the Special Education Planning Districts (SEDs) located throughout the state. The use of the SEDs facilities will assist the fulfillment of the program goals while addressing equitable distribution. In addition to the SEDs, program marketing, outreach and recruitment will occur through state-level organizations such as the Indiana Association of School Business Officials, and via direct outreach to the school districts themselves.

Marketing and outreach activity will be conducted initially over the phone with the Director of each Special Education District (SED) and/or the individual school districts.

Program Tracking

The program vendor will be required to perform detailed program tracking.

Budget Assumptions

An estimated three-year budget for this program is provided below. There are no costs to participating customers.

Table 20: Estimated Three-Year Program Budget – Energy Efficient Schools – Audit

Energy Efficient Schools - Schools	Cost per Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$10,000	$10,000	$10,000	$30,000	7%
DSM Staffing		$25,875	$26,781	$27,718	$80,373	19%
Monitoring & Evaluation		$75,000	$75,000	$75,000	$225,000	52%
Variable Costs						
Incentives	$1,717	$20,606	$24,041	$27,475	$72,122	17%
Delivery & Other	$600	$7,200	$8,400	$9,600	$25,200	6%
Total Budget		$138,681	$144,221	$149,793	$432,696	100%

Program 6. Commercial and Industrial Retro-Commissioning Lite (CORE PLUS)

This program targets commercial and institutional customers with a usage profile that indicates a possible high value from retro-commissioning. Although direct requests may also be received, typically the program begins off-site with a scan of billing records using EZ Sim or a similar tool. This screening process will select a pool of buildings for which it looks like retro-commissioning is highly likely to produce substantial energy savings. Building commissioning is a process that is associated with new buildings; a quality assurance process that is followed to facilitate new buildings performing as designed. Retro-commissioning applies a similar process to existing buildings. The goal is insure that a building operates efficiently and effectively. The focus of this pilot program is in insuring efficient operation, rather than on upgrading equipment. The program conducts a low-cost "tuning" of electricity related building systems. The tuning typically involves control systems such as energy management systems that may be improperly programmed, or controls that are out of calibration. When problems are identified and demonstrated, they may have major economic effects. When this type of problem exists, retro-commissioning resolves such problems at low cost.

There is single measure, retro-commissioning. This project will also feed participants towards the Commercial & Industrial Rebates Program and the Commercial & Industrial Custom Program.

Rationale

Most buildings have never been commissioned, so the commissioning of an existing building may be able to identify and correct high priority operating deficiencies and verify proper operations. The focus will typically be on energy-using equipment, lighting, and controls. Further, this program is designated as "retro-commissioning lite," since it will involve engagements of about $4,000 per building[5], rather than the $10,000 to $52,000 associated with

---

[5] This is per building; an individual project may have more than one building.

full retro-commissioning.[6] The objective will be to find the best buildings for the program. These will be buildings with significant energy problems that can be easily detected and easily fixed. Energy savings will be documented by engineering calculations and evaluated using EZ Sim. The persistence of energy savings will also be tested.

Participation and Measures

Measures are listed below.

Table 21: Measures and Incentives – C&I Retro-Commissioning Lite

Measure	Measure Number	Incentive Amount
Retro Commissioning Engagement	C-3	$750

Table 22: Estimated Participation and Savings – C&I Retro-Commissioning Lite

C&I Retro Commissioning Lite				
Potential Participants				42,400
Per participant Savings (kWh):				26,253
Per Participant Savings (kW):				4.3
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,060	2.5%	27,828,180	4,583
2015	1,442	3.4%	37,856,826	6,234
2016	1,908	4.5%	50,090,724	8,249
Average	1,470	3.5%	38,591,910	6,355

---

[6] See Haasl &Terry Sharp, A Practical Guide for Commissioning Existing Buildings. Washington, DC: Office of Building Technology, State and Community Programs, US Department of Energy. Prepared by Portland Energy Conservation, Inc. and Oak Ridge National Laboratory, April 1999.

Marketing Plans

We recommend some general advertising within the business community, primarily in the form of brochures and mailings targeted to potential program participants; also coordination with business associations.

Program Tracking Considerations

The program manager should collect, at a minimum, information about all customer electrical equipment, hours of operation, etc. The major concern will be for complete and accurate documentation of "before" and "after" energy use and demand impacts. In addition, a way to monitor the duration of energy savings and demand reduction should also be included.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. Costs to participating customers include the remainder of equipment costs. Note that the delivery cost shows as zero. This is due to bundling delivery cost into the $1,500 per site (see incentive of $750 under variable costs) and the $50,000 per year for implementation and other annual costs.

Table 23: Estimated Three-Year Program Budget – C&I Retro-Commissioning Lite

C&I Retro Comm. Lite	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$50,000	$50,000	$50,000	$150,000	4%
DSM Staffing		$69,863	$72,308	$74,837	$217,007	5%
Monitoring & Evaluation		$120,000	$120,000	$120,000	$360,000	9%
Variable Costs						
Incentives	$750	$795,000	$1,081,500	$1,431,000	$3,307,500	82%
Delivery & Other	$0	$0	$0	$0	$0	0%
Total Budget		$1,034,863	$1,323,808	$1,675,837	$4,034,507	100%

This program also serves as a feeder program for the prescriptive program (Program 5, C&I Rebates).

Program 7. Commercial and Industrial HVAC and Refrigeration Optimization (CORE PLUS)

This program was designed on the premise that much commercial, industrial, and institutional Heating Ventilation and Cooling is not operating as planned. A typical assignment envisioned in this program is to do on-site testing of HVAC units, and review their operation as an integrated building system. For example, out of twelve rooftop units, it is likely that two will be operating out of specification due to improper installation, subsequent damage to units, or problems with controls. In the case of a large school, built in sections over time, it would not be unusual to find adjacent units, some cooling and some heating, and other units damaged while most units are performing as designed.

Rationale

Most buildings have never had a focused look at the working of the HVAC systems. This program will deploy HVAC specialists to test units and make recommendations for their efficient operation as a building system. This will primarily involve repair of units and control adjustments, but may also involve recommendations for modification to air circulation within buildings.

Participation and Measures

Measures are listed below.

Table 24: Measures and Incentives – C&I HVAC and Refrigeration Optimization

Measure	Measure Number	Incentive Amounts
Small HVAC Optimization	C-2	50%
Grocery Refrigeration Tune-Ups and Improvements	C-29	50%
Refrigeration Casework Improvements	C-30	50%

Participation is indicated in the table below.

Table 25: Estimated Participation and Savings – C&I HVAC and Refrigeration Optimization

C&I HVAC & Refrigeration Optimization				
Potential Participants				25,100
Per participant Savings (kWh):				7,155
Per Participant Savings (kW):				1.2
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	853	3.4%	6,103,215	1,056
2015	1,054	4.2%	7,541,370	1,305
2016	1,381	5.5%	9,881,055	1,710
Average	1,096	4.4%	7,841,880	1,357

Marketing Plans

It is likely that company representatives can help develop lists of buildings that will be likely candidates for this program. In addition, there should be coordination with business associations. The budget below provides for some general advertising at business events, as well as brochures and premiums.

Program Tracking Considerations

This is an applied technical program that will be dependent on the quality and completeness of technical drawings and brief technical explanation provided by the program staff. Evaluation will rely on this information and may also involve spot metering and (where applicable) billing analysis.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. Costs to participating customers include the remainder of costs (for repairs to HVAC equipment and remodeling to permit better airflow within buildings).

Table 26: Estimated Three-Year Program Budget – C&I HVAC and Refrigeration Optimization

C&I HVAC & Refrig Optimization	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$50,000	$50,000	$50,000	$150,000	4.4%
DSM Staffing		$69,863	$72,308	$74,837	$217,007	6.4%
Monitoring & Evaluation		$100,000	$100,000	$100,000	$300,000	8.8%
Variable Costs						
Incentives	$830	$707,990	$874,820	$1,146,230	$2,729,040	80.4%
Delivery & Other	$0	$0	$0	$0	$0	0%
Total Budget		$927,853	$1,097,128	$1,371,067	$3,396,047	100%

This program also serves as a feeder program for the prescriptive program (Program 5, C&I Rebates).

Program 8. Commercial and Industrial Audit (CORE PLUS)

This program is targeted to small commercial/retail establishments, food service facilities and grocery store/supermarkets. It consists of refrigeration casework improvements, improvements to refrigeration setpoints to reduce load, restaurant commissioning audits (designed to optimize controls and limit energy losses in food service facilities) and a commercial LED bulb change out. The program will also serve as a feeder to Program 5, C&I Rebates.

Rationale

There are consistent energy savings to be obtained from food service facilities (primarily restaurants) and the refrigeration end-use in grocery stores and supermarkets. There are four DSM measures in this program, listed in the table below.

Participation and Measures

Measures are listed below.

Table 27: Measures and Incentives – C&I Audit

Measure	Measure Number	Incentive Amount
Small Commercial LED Change out	C-21	100%
Restaurant and Grocery Audit	C-28	100%
Grocery Refrigeration Tune-Up and Improvements	C-29	50%
Refrigeration Casework Improvements	C-30	50%

Participation is indicated in the table below.

Table 28: Estimated Participation and Savings – C&I Audit

C&I Audit				
Potential Participants				2,470
Per participant Savings (kWh):				15,973
Per Participant Savings (kW):				2.3
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	86	3.5%	1,373,678	194
2015	99	4.0%	1,581,372	224
2016	111	4.5%	1,773,003	251
Average	99	4.0%	1,182,002	167

Marketing Plans

It is likely that company representatives can develop lists of buildings that will be likely candidates for this program. In addition, there should be coordination with business associations. There are two audit paths for measure implementation within this program. The LED change out measure is to be managed as an independent feature and a "feeder" to the efficiency audit measure. In this case a local lighting supplier is hired as the ESCO for this measure with pre-approved rates for material and labor based solely on a per-bulb basis. As teams of installers contact potential businesses an agreement to include a C&I audit for grocery/supermarket and food service facilities will be required to receive the 100% incented LED bulb offering. During a normal C&I measure audit, in absence of the LED bulb contact, the offering of the LED change out will be made in addition to those measures and programs made available through the audit process.

Program Tracking Considerations

This is an applied technical program that will be dependent on the quality and completeness of technical drawings and brief technical explanation provided by the program staff developed on-site for each project.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 29: Estimated Three-Year Program Budget – C&I Audit

C&I Audit	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$50,000	$50,000	$50,000	$150,000	15%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	11%
Monitoring & Evaluation		$45,000	$45,000	$45,000	$135,000	13%
Variable Costs						
Incentive	$1,970	$169,420	$195,030	$218,670	$583,120	57%
Delivery & Other	$130	$11,180	$12,870	$14,430	$38,480	4%
Total Budget		$310,531	$339,054	$365,519	$1,015,104	100%

This program also serves as a feeder program for the prescriptive program (Program 5, C&I Rebates).

Program 9. Commercial and Industrial Custom (CORE PLUS)

This program targets only commercial, industrial and institutional accounts. The program is a totally custom program, designed to develop exceptionally productive energy savings opportunities in cooperation with the customer. Each project will be specially designed. The incentive is projected to be fifty percent of incremental cost. It is expected that projects will need to be carried out in narrow time windows as dictated by conditions specific to the customer's operations and that evaluation will consist primarily of short term instrumentation and spot metering. For the first nine months of each program year, no project may be allocated more than ten percent of the measures budget allocated for this program. The hurdle rate for projects under this program will be set to insure only the most cost-effective projects are selected so as to insure cost recovery.

Rationale

Some commercial and institutional customers will offer special opportunities for energy savings, either brought to I&M by the customer (or the customer's ESCO), or as identified by company account representatives and engineers. By providing a fifty percent "buy down," customer projects will be likely to move forward. Experience will show whether a fifty percent buy down is enough to attract projects. If this percentage proves too low (based on response to the program) the percentage buy down will be raised. Experience with similar projects in the Northeast has led utilities to offer 90 percent to 75 percent buy downs in this program sector. The hurdle rate (payment for savings) for the program will be set to insure I&M only acquires cost-effective projects.

Participation and Measures

Measures are shown below.

Table 30: Measures and Incentives – C&I Custom

Measures	Measure Number	Incentive
Customer Specified (Electric)	NA	Cost share of study to develop project proposal and 50% of energy efficiency improvements
Energy Champion (Large Industrial)	NA	
Integrated Building Design	C-8	

Table 31: Estimated Participation and Savings - C&I Custom

C&I Custom				
Potential Participants				4,000
Per participant Savings (kWh):				870,962
Per Participant Savings (kW):				143.3
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	54	1.4%	47,031,948	7,738
2015	64	1.6%	55,741,586	9,171
2016	72	1.8%	62,709,264	10,318
Average	63	.6%	55,160,927	9,076

Because of the custom nature of the project, there will not be a large number of participants in any one year. Each participant, in this type of program, is special which makes tailoring to specific customers unique. In encouraging participation, it is important to recognize that standard baselines such as current practice for an industry or least cost alternative do not work for custom settings. Recognizing the unique baseline for each site, which will depend on the business operating procedures and on interactive equipment as much or more than on market factors should help in recruitment of participants

Marketing Plans

An example of this type of program is NSTAR Electric's Compressed Air Leak Detection and Remediation Program (www.compressedairchallenge.org and www.nstaronline.com/business/energy_efficiency). Also see Pacific Power's Energy FinAnswer and Energy FinAnswer Express programs, the WPPI, SDG&E and Mid-American Large Bid Programs and the Xcel Energy Large Industrial Process Improvement Program. It is expected that these will be high return projects in terms of savings achieved. The program approach is to "get out of the box" of conventional utility DSM programs to embrace programs that large customers may pursue for reasons of overall industrial efficiency. While both gas and electric energy will need to be analyzed, the Company would fund portions of these projects that produce electrical demand reductions and energy savings.

Program Tracking Considerations

Data requirements will vary with the specifications for each project. In some cases, utility billing meter information is capable of the level of detail required to assess program impacts. In other cases, spot metering or other types of assessment may be required. In any case, the program manager should collect, at a minimum, information about all customer electrical equipment, hours of operation, etc. It is expected that evaluations will primarily take the form of short term instrumentation and spot metering with engineering review. Since these are custom projects, it will be particularly important in insure provision is made to assess the kWh and/or kW condition that constitutes the baseline, and then measure the change due to the DSM improvements.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. Costs to participating customers include the remainder of energy study cost to develop project proposals, provision for staff involvement in developing and monitoring the project, and the remainder of equipment costs.

Table 32: Estimated Three-Year Program Budget – C&I Custom

C&I Custom	Cost per Participant	2014	2015	2016	3-Yr Total	Percent of Total
Fixed Costs						
Implementation & Other Annual Cost		$30,000	$30,000	$30,000	$90,000	2%
DSM Staffing		$69,863	$72,308	$74,837	$217,007	4%
Monitoring & Evaluation		$120,000	$120,000	$120,000	$360,000	7%
Variable Costs						
Incentives	$21,360	$1,153,440	$1,367,040	$1,537,920	$4,058,400	79%
Delivery & Other	$2,000	$108,000	$128,000	$144,000	$380,000	7%
Total Budget		$1,481,303	$1,717,348	$1,906,757	$5,105,407	100%

Program 10. Residential Home Energy Audit (CORE)

This program targets single-family and multi-family homes for a series of low-cost direct installed measures. Onsite walkthroughs are performed and recommendations are given for targeted weatherization retrofits that are needed and guidance is given to help the customer achieve greater savings in the home. The program delivery agent is responsible for the outreach and performance of the program and deemed savings are determined on a per site basis.

Rationale

The On-Site Audit with direct install program element will provide households with a walk-through examination of their home by a trained auditor. The auditor will convey energy saving tips during the walk-through, and attempt to be comprehensive in their assessment of opportunities. The recommendations of the auditor are expected to be standard measures associated with whole house weatherization, such as ceiling insulation, wall insulation, air sealing, etc. At the same time, during the walk-through audit, the auditor will install the measures at no cost to the customer.

Participation and Measures

Measures are listed below.

Table 33: Measures and Incentives – Residential Home Energy Audit

Measure	Measure Number	Incentive Amounts
Efficient Residential Lighting	R-11	100% of incremental cost
Low Flow Fixtures	R-12	100% of incremental cost
WH Tank/Pipe Wrap and Temp Setpoint	R-13	100% of incremental cost

Projected participation is shown in the table below.

Table 34: Estimated Participation and Savings – Residential Home Energy Audit

Residential Home Energy Audit				
Potential Participants				389,500
Per participant Savings (kWh):				465
Per Participant Savings (kW):				0.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	6,201	1.6%	2,883,465	741
2015	5,453	1.4%	2,535,645	652
2016	5,453	1.4%	2,535,645	652
Average	5,702	1.5%	2,651,585	681

Marketing Plan

Marketing and customer communications will be orchestrated through the CORE program's contractor and the Utilities. Working together the groups will orchestrate a messaging campaign that will develop a target list of potential customers and ensure that customers understand the program benefits. The development of scheduled site visits will be orchestrated using a variety of outreach platforms including, direct mail, internet, email, call center and via neighborhood canvassing. All enrollment methods will provide detailed information to the customer regarding the scope of program operations.

Program Tracking Considerations

The CORE program contractor will be required to maintain a program tracking database.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. This program is provided at no cost to the customer. Due to the cost reimbursement mechanism established for gas treated

homes, costs associated with measures that produce gas savings but no electric savings are not included. Gas savings are not included in the model.

Table 35: Estimated Three-Year Program Budget – Residential Home Energy Audit

Res On-Site Audit	Cost per Participant	2014	2015	2016	3-Yr Total	Percent of Total
Fixed Costs						
Implementation & Other Annual Cost		$10,000	$10,000	$10,000	$30,000	2%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	6%
Monitoring & Evaluation		$30,000	$30,000	$30,000	$90,000	5%
Variable Costs						
Incentive	$37	$230,057	$202,306	$202,306	$634,670	37%
Delivery & Other	$50	$310,050	$272,650	$272,650	$855,350	50%
Total Budget		$615,038	$551,110	$552,375	$1,718,523	100%

Program 11. Residential Lighting (CORE)

The Residential Lighting program is focused on providing wholesale incentives to buy down or mark down the incremental cost of CFLs, LEDs, and other efficient lighting fixture and control systems.

The promotion will provide discounts to utility customers toward the purchase of CFLs, LEDs, and other ENERGY STAR qualified lighting efficiency products.

Rationale

The Residential Lighting program elements both improve the product mix in favor of energy efficient technologies for the service territory by promoting the purchase and stocking of efficient replacement units. Energy Star has overcome all of the defects of the earlier local or regional promotional programs through a single national program structured to periodically advance program standards and regulate minimum efficiencies. At the same time, it is structured to work with regional marketing initiatives and local promotion.

Participation and Measures

Measures are shown in the table below.

Table 36: Measures and Incentives - Residential Lighting

Measures/Program Element	Measure Number	Incentive Amount
Efficient Residential Lighting	R-11	66%

Projected participation by year is shown in the table below.

Table 37: Estimated Participation and Savings - Residential Lighting

Residential Lighting				
Potential Participants (yearly)				389,500
Per participant Savings (kWh):				274
Per Participant Savings (kW):				0.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	60,373	15.5%	16,542,202	3,816
2015	70,110	18.0%	19,210,140	4,432
2016	74,005	19.0%	20,277,370	4,678
Average	68,163	17.5%	18,676,571	4,309

Marketing Plans

The program delivery agent will perform regular store visits to actively engage customers in Indiana with messages about the cost savings and environmental benefits of energy efficient lighting products. Promotional lighting program labeling and signage will be placed in retail locations that promote the participant products and provide customers with cost and efficiency value information. Activities within retail events may include a booth, educational materials and hands-on activities.

Program Tracking Considerations

Data collection and documentation for program purposes and monthly/annual reporting will be included as features of the vendor program.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 38: Estimated Three-Year Program Budget – Residential Lighting

Residential Lighting	Cost per Participant	2014	2015	2016	3-Yr Total	Percent of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	0.4%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	0.8%
Monitoring & Evaluation		$50,000	$50,000	$50,000	$150,000	1.1%
Variable Costs						
Incentives	$63	$3,803,499	$4,416,930	$4,662,315	$12,882,744	90.6%
Delivery & Other	$5	$301,865	$350,550	$370,025	$1,022,440	7.2%
Total Budget		$4,210,295	$4,873,634	$5,139,759	$14,223,688	100%

Program 12. Energy Efficient Schools – Education (CORE)

The program is available to public and private schools in the service territory for students in grades 5 and 6. The goal is to educate students about energy use and to produce cost effective electric and natural gas savings by influencing students and their families to focus on conservation and efficient use of electricity. Each eligible student will receive a kit of low-cost efficiency measures and educational materials.

Rationale

Education programs have in the past largely been seen as a part of the public service role of utilities and have generally emphasized information about the science of electricity and safety around power lines or when using electricity. The current program emphasizes the problem of assessing opportunities to make a home more energy efficient, joined with an opportunity to install kit items.

Education programs are important even without immediate energy savings because the substantial payoff for these programs is in the knowledge gained by the students and the potential influence it will have in their ability to make smart energy choices over the life course. The assessed savings for this program come from the kit measures installed.

Participation and Measures

Measures are shown in the table below, and may be added or subtracted during the program based on experience.

Table 39: Measures and Incentives – Residential Energy Efficient Schools - Education

Measures – Kit Items	Measure Number	Incentive
Efficient Residential Lighting	R-11	100%
Low Flow Fixtures	R-12	100%

Table 40: Estimated Participation and Savings – Energy Efficient Schools - Education

Energy Efficient Schools - Education				
Potential Participants				5,729
Per participant Savings (kWh):				318
Per Participant Savings (kW):				0.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	5,443	95.0%	1,730,874	446
2015	5,443	95.0%	1,730,874	446
2016	5,443	95.0%	1,730,874	446
Average	5,443	95.0%	1,730,874	446

Marketing Plans

This program is unusual because its success depends on considerable ongoing effort to work with school organizations at several levels in order to insure institutional support and to promote enthusiasm for the program among teachers and students.

Program Tracking

The program requires detailed reporting on school, classroom and student participation rates, allocation of kits, and documentation of kit items installed. All data requirements should be part of the program database maintained by the program vendor.

Budget Assumptions

An estimated three-year budget for this program is provided below. There are no costs to participating customers. Due to the cost reimbursement mechanism established for gas treated homes, costs associated with measures that produce gas savings but no electric savings are not included. Gas savings are not included in the model.

Table 41: Estimated Three-Year Program Budget – Energy Efficient Schools – Education

Energy Efficient Schools - Education	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	5.2%
DSM Staffing		$25,875	$26,781	$27,718	$80,373	7.0%
Monitoring & Evaluation		$75,000	$75,000	$75,000	$225,000	19.6%
Variable Costs						
Incentives	$23	$124,645	$124,645	$124,645	$373,934	32.6%
Delivery & Other	$25	$136,075	$136,075	$136,075	$408,225	35.6%
Total Budget		$381,595	$382,500	$383,437	$1,147,532	100%

Program 13. Income Qualified Weatherization (CORE)

This program will serve income qualified residential customers. The program element is the Residential Low Income Program which will serve customers up to an including 200 percent of the Federal Poverty Level. The program is oriented toward single-family detached homes. .

Rationale

Low-income programs are different from traditional DSM programs. They are a special case in that they attempt to cover four objectives:

1. Like other DSM programs, a core objective is to provide energy savings (DSM savings).
2. Unlike other DSM programs, a second core objective is to provide repairs necessary to install energy savings improvements in a part of the housing stock that is often old and substandard in comparison to middle and upper income housing.
3. Provide DSM service to customers who otherwise could not obtain DSM improvements due to cost.
4. Due to problems with low-income housing stock, address health and safety concerns.
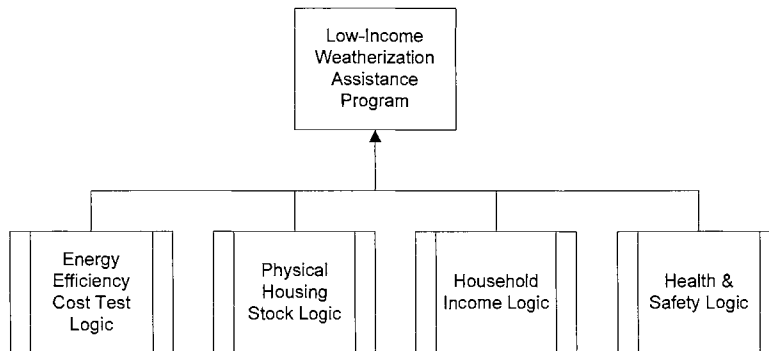
For these reasons, the prevailing practice in the area of low-income programs is not to focus solely on the "California tests" traditionally used in DSM program review.[7] Instead,

---

[7] For low-income programs, program cost-effectiveness is a lesser issue, although still an important objective. Because of their particular focus on the special needs of disadvantaged households, low-income energy efficiency programs are generally not held to the same cost-effectiveness criteria as utility energy-efficiency "resource" programs (i.e., while test results are calculated for consideration as one factor, they are not judged with a strict "total resource cost" test, or TRC). More typically, the focus is on the magnitude of utility bill savings to participating customers, rather than the utility system avoided energy supply costs. Also, low-income programs often include

commissions have been adopting different tests for low-income programs. For example, the DC Commission uses an "Expanded All Ratepayers Test" (incorporating several "non-energy benefits" for low-income programs if the Benefit Cost ratio on the initial TRC test is 0.8 or above). The California commission uses a "Modified Participant Test" and a Utility Cost Test (including "non-energy benefits") for screening measures for low-income programs. A measure is accepted into the program if it passes either test. Thus, the Total Resource Cost (TRC) test result for the Southern California Edison Low-Income Energy Management Assistance Program was 0.63 for 2004 and 0.61 for 2005. Similarly, the TRC for Pacific Gas & Electric's Low-Income Energy Partners Program was 0.41 for 2004.[8]

Unlike most of the DSM programs in this report, the Income Qualified Weatherization Program will also serve homes heated with natural gas up to the limit of reimbursement by gas companies. Due to the cost reimbursement mechanism established for gas treated homes, costs associated with measures that produce gas savings but no electric savings are not included. Gas savings (therms) are also not included in the spreadsheet models.

Participation and Measures

The types of weatherization measures to be offered are shown in the table below. This program is free to qualifying participants each year until funds are exhausted.

Table 42: Measures – Residential Income Qualified Weatherization

Measure	Measure Number
Ceiling Insulation/Attic Insulation	R-2
Refrigerator Charge and Duct Tune-Up	R-4
House Sealing Using Blower Door	R-5
Efficient Residential Lighting	R-11
Low Flow Fixtures	R-12
Tank Wrap, Pipe Wrap and Water Temp Setpoint	R-13

broader "non-energy benefits" (NEBs) such as lowered credit and collection costs and avoided bad debt for the utility, and improved health and safety for customers. See: Kushler, Martin, Dan York & Patti Witte, "Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs." Washington, DC: American Council for an Energy-Efficient Economy, Report Number U053, September 2005.

[8] For differences in the treatment of TRC with respect to low-income programs in several jurisdictions, please see: https://dl.dropbox.com/u/12011114/The%20TRC%20and%20Low-Income.pdf

Table 43: Canvassing Measures – Residential Income Qualified Weatherization

Measure	Measure Number
7-Plug Smart Strips	RC-1
Compact Fluorescent Light	RC-2

Table 44: Estimated Participation and Savings - Residential Income Qualified Weatherization

Income Qualified Weatherization				
Potential Participants				135,500
Per participant Savings (kWh):				1,730
Per Participant Savings (kW):				0.6
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,322	1.0%	2,287,060	810
2015	1,322	1.0%	2,287,060	810
2016	1,322	1.0%	2,287,060	810
Average	1,322	1.0%	2,287,060	810

Marketing Plans

Marketing will be performed as a combined effort between the utility and the program delivery agent. Identified communities will receive program information and canvassing dates during which time each home will be approached for weatherization services on a door-to-door basis.

Program Tracking Considerations

Data collection and documentation for program purposes and annual reporting will require a tracking system. The selected delivery contractor will be requested to carry out most of the data entry for this system.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. Costs to participating customers will be customer's time and permitting access to the home for improvements.

Table 45: Estimated Three-Year Program Budget – Residential Income Qualified Weatherization

Income Qualified Weatherization	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	0.6%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	1.1%
Program Monitoring & Evaluation		$120,000	$120,000	$120,000	$360,000	3.7%
Variable Costs						
Incentives	$574	$759,452	$759,452	$759,452	$2,278,356	23.4%
Delivery & Other	$1,750	$2,313,500	$2,313,500	$2,313,500	$6,940,500	71.2%
Total Budget		$3,247,883	$3,249,106	$3,250,371	$9,747,360	100%

Program 14. Residential Weatherization (CORE PLUS)

This program provides a home weatherization inspection audit, blower-door leak test and recommendations to the homeowner for incented weatherization measures. This program targets electrically heated homes that have incomes above the qualification criteria for the moderate and income qualified weatherization program. The program is designed to ensure the retrofit installation of major weatherization measures in households.

Rationale

The program is designed to promote whole-house or near whole-house weatherization for families above moderate incomes.

Participation and Measures

Measures are shown in the table below, and may be added or subtracted during the program based on experience.

Table 46: Measures and Incentives – Residential Weatherization

Measure	Measure Number	Incentive Amounts
Wall Insulation	R-1	40%
Ceiling Insulation	R-2	40%
Programmable Thermostats	R-3	40%
Refrigerator Charge and Duct Repair	R-4	40%
House Sealing Using Blower Door	R-5	40%
Low Flow Fixtures	R-12	40%
HW Tank/Pipe Wrap and Temperature Setpoint	R-13	40%

Projected participation is shown in the table below.

Table 47: Estimated Participation and Savings - Residential Weatherization

Residential Weatherization				
Potential Participants				56,724
Per participant Savings (kWh):				2,085
Per Participant Savings (kW):				0.9
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,333	2.4%	2,779,305	985
2015	1,361	2.4%	2,837,685	1,005
2016	1,418	2.5%	2,956,530	1,047
Average	1,371	2.4%	2,857,840	1,012

Marketing Plans

I&M will need to actively market this program in customer communications, such as bill stuffers and radio or television spot advertisements. Employees can also make customers aware of this program if they contact the company about energy efficiency or a need to lower bills.

Program Tracking Considerations

Data collection and documentation for program purposes and annual reporting will require a tracking system. The selected delivery contractor will be requested to carry out most of the data entry for this system. All data requirements should be part of the program database.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 48: Estimated Three-Year Program Budget – Residential Weatherization

Res Weatherization	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	1%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	2%
Monitoring & Evaluation		$100,000	$100,000	$100,000	$300,000	6%
Variable Costs						
Incentives (paid annually to participants)	$419	$557,994	$569,715	$593,575	$1,721,283	33%
Delivery & Other	$750	$999,750	$1,020,750	$1,063,500	$3,084,000	58%
Total Budget		$1,712,675	$1,746,618	$1,814,493	$5,273,787	100%

Program 15. Moderate Income Weatherization (CORE PLUS)

This program provides a home weatherization inspection audit and blower-door leak tests and recommendations to the homeowner for incented weatherization measures. This program targets electrically heated homes that have incomes above the qualification criteria for the Core Income Qualified Weatherization program but below 300% FPL. The program is designed to ensure the retrofit installation of major weatherization measures in households.

Rationale

The program is designed to promote whole-house or near whole-house weatherization for families of moderate income. The program designed incentive is lower than the Core Income Qualified Weatherization program but more than the Core Plus Residential Weatherization Program. Some health and safety repair costs are included in the implementation budget.

Participation and Measures

Measures are shown in the table below, and may be added or subtracted during the program based on experience.

Table 49: Measures and Incentives – Moderate Income Weatherization

Measure	Measure Number	Incentive Amounts
Wall Insulation	R-1	50%
Ceiling Insulation	R-2	50%
Programmable Thermostats	R-3	50%
Refrigerator Charge and Duct Repair	R-4	50%
House Sealing Using Blower Door	R-5	50%
Residential Efficient Lighting	R-11	100%
Low Flow Fixtures	R-12	50%
HW Tank/Pipe Wrap and Temperature Setpoint	R-13	50%

Projected participation is shown in the table below.

Table 50: Estimated Participation and Savings – Moderate Income Weatherization

Moderate Income Weatherization				
Potential Participants				17,650
Per participant Savings (kWh):				4,124
Per Participant Savings (kW):				1.5
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	706	4.0%	2,911,544	1,031
2015	794	4.5%	3,274,456	1,160
2016	883	5.0%	3,641,492	1,290
Average	794	4.5%	3.275,831	1,160

Marketing Plans

I&M will need to actively market this program in customer communications, such as bill stuffers and radio or television spot advertisements. Employees can also make customers aware of this program if they contact the company about energy efficiency or a need to lower bills.

Program Tracking Considerations

Data collection and documentation for program purposes and annual reporting will require a tracking system. The selected delivery contractor will be requested to carry out most of the data entry for this system. All data requirements should be part of the program database.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 51: Estimated Three-Year Program Budget – Moderate Income Weatherization

Moderate Income	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	1%
DSM Staffing		$25,875	$26,781	$27,718	$80,373	1%
Monitoring & Evaluation		$100,000	$100,000	$100,000	$300,000	5%
Variable Costs						
Incentives	$756	$533,612	$600,125	$667,393	$1,801,131	28%
Delivery & Other	$1,750	$1,235,500	$1,389,500	$1,545,250	$4,170,250	65%
Total Budget		$1,914,987	$2,136,406	$2,360,361	$6,411,754	100%

Program 16. Residential Energy Efficient Products (CORE PLUS)

This program will provide rebates to I&M customers toward the purchase energy efficient appliances including ductless heat pumps, heat pump water heater, and selected consumer electronics. Cool roof materials will also be included.

The dollar amount for the appliance incentive for this promotion is lower than might be expected based on industry experience in prior years. This is due in part to recent changes in the Energy Star program and the overall success of the Energy Star strategy as demonstrated by the gradual increase in energy efficiency of base case (non-Energy Star) equivalent products. Refrigerators may be included based on analysis as new Energy Star refrigerator standards go into effect. Currently some DSM administrators, such as the Energy Trust of Oregon, offer refrigerator rebates only on Consortium for Energy Efficiency (CEE) Tier 3 refrigerators. Rebates for energy efficient appliances should be set using Consortium for Energy Efficiency tiers.

Rationale

Energy efficient appliances and other residential products improve the product mix in favor of energy efficient technologies for the service territory by promoting the purchase and stocking of efficient replacement units. Appliance promotions are best developed on a national level with participation by utilities and governments. Energy Star has overcome all of the defects of the earlier local or regional promotional programs through a single national program structured to periodically advance program standards and regulate minimum efficiencies. At the same time, it is structured to work with regional marketing initiatives and local promotion.[9]

Participation and Measures

Representative measures are shown in the table below.

---

[9] For an example of the history of the residential clothes washer initiative, see Shel Feldman Management Consulting, Research into Action incorporated, and Xenergy incorporated, *The Residential Clothes Washer Initiative, A Case Study of the Contributions of a Collaborative Effort to Transform the Market*, prepared for the Consortium for Energy Efficiency, June 2001.

Table 52: Measures and Incentives – Residential Energy Efficient Products

Measures	Measure Number	Incentive
Cool Roofs	R-7	50%
Electric Heat to SEER 16 Heat Pump	R-8	50%
Energy Star Clothes Washer	R-10	50%
Heat Pump Water Heater	R-14	50%
Ductless Heat Pump	R-15	50%

Table 53: Estimated Participation and Savings – Residential Energy Efficient Products

RES EE Products				
Potential Participants (yearly)				389,500
Per participant Savings (kWh):				801
Per Participant Savings (kW):				0.2
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	19,086	4.9%	15,287,886	3,542
2015	19,086	4.9%	15,287,886	3,542
2016	19,086	4.9%	15,287,886	3,542
Average	19,086	4.9%	15,287,886	3,542

Because of normal consumption trends, a large numbers of customers are expected to participate in this program from the beginning. Note that for this program customers may repeat in different years. The offer of energy efficient products is a long established role for utilities. Also, customers tend to trust utilities for information on energy efficiency. Communication with customers regarding offerings in this program is expected to proceed with ease.

Marketing Plans

Proposed marketing efforts focus on coordinated advertising with selected retail outlets, general media ads and bill stuffers. This type of program is best implemented using program implementation vendors. The program elements exist in nationally available programs for utilities to implement, and selection of a regional vendor will provide added value in the form of detailed program and technology knowledge and relationships. A basic assumption in the development of this program is that it is not so much the size of the rebate so much as the existence of a rebate and the skill in developing engaging promotions and long-

term relationships with the appliance industry and dealers that will help move the more energy-efficient products.[10]

The basic marketing goals for the appliance program elements come from the Consortium for Energy Efficiency and Top Ten™ and are provided below:[11]

- Consumers understand and value the benefits from energy-efficient features.
- Retail sales force is knowledgeable about Energy Star and considers it a meaningful distinction for making a sale.
- Rebate stickers are on appliances on retail sales floors.
- Manufacturers market and promote energy-efficient products and/or features.
- Energy efficiency, defined by Energy Star performance levels, becomes a standard feature or is available across all manufacturers' product lines.
- Energy Star represents the most energy efficient quality products available, but generally now serve as the base and the rebated appliance is typically a Tier 3 Consortium for Energy Efficiency retail appliance or a Top Ten™ level Energy Star appliance. *Though we refer to the efficient alternative as Energy Star, we really mean Consortium for Energy Efficiency Tier 3 or Top Ten™ appliances.*

In this program, I&M will be an active participant in the US Energy Star campaign. Through this participation, it is expected that the company will move more Energy Star products into retail stores, help make energy efficient lighting more affordable to its customers, and provide a continuing and responsible guidance and energy efficiency education message to customers.

Incentives may be implemented by coupons, in-store markdowns, or upstream manufacturer buy-downs. A coupon approach is more suitable for a service territory because it gives the program administrator direct control over where coupons are available and for which sales outlets.

Program Tracking

Data collection and documentation for program purposes and monthly/annual reporting will be included as features of the vendor program "package." Data estimation of the baseline market and market potential for the specific Energy Star appliances promoted should be refined as a part of the vendor services and developed for each product type.

---

[10] A review of rebates offered across the US suggests that most utilities are offering rebates from this kind of marketing and promotional perspective rather than from a direct resource acquisition perspective. See the Database of State Incentives for Renewables & Efficiency, (DSIRE), maintained by the North Carolina Solar Center for the Interstate Renewable Energy Council (IREC) funded by the U.S. Department of Energy (DSIRE) at http://www.dsireusa.org/.

[11] CEE's National Residential Home Appliance Market Transformation Strategic Plan, December 2000 (http://www.docstoc.com/docs/78624721/Home-Appliance-Market).

Budget Assumptions

An estimated three-year budget for this program is provided below. The cost to participating customers is the customer's share of the cost (cost of product after the rebate).

Table 54: Estimated Three-Year Program Budget – Residential Energy Efficient Products

RES EE Products	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$10,000	$10,000	$10,000	$30,000	0.2%
DSM Staffing		$25,875	$26,781	$27,718	$80,373	0.5%
Monitoring & Evaluation		$75,000	$75,000	$75,000	$225,000	1.5%
Variable Costs						
Incentives	$254	$4,845,267	$4,845,267	$4,845,267	$14,535,802	95.9%
Delivery & Other	$5	$95,430	$95,430	$95,430	$286,290	1.9%
Total Budget		$5,051,572	$5,052,478	$5,053,415	$15,157,465	100%

Program 17. Residential Online Audits (CORE PLUS)

This program provides an online tool available for all residences within the I&M service territory. Individuals are invited to participate by modeling their residence's equipment and typical household operations. Guidance is then given to the participant on potential energy efficiency activities or measures that might be useful in helping them to achieve greater efficiency within their home. Based on the survey results, a kit of low-cost measures is mailed to the participants for self-installation.

Rationale

The program is open to all residential customers at no charge to provide easy access to energy efficiency recommendations tailored to the home. Since it is conducted by Internet, it can fit in a customer's schedule, and provides an opportunity for all customers to participate. The program elements are an entry-level degree of customer engagement, providing a way for customers to begin to get direct information on what they can do to make their home more energy efficient.

All homes will receive low-cost lighting measures for self-installation. Homes that identify as electrically heated will also receive water conservation measures.

Participation and Measures

Measures are shown below.

Table 55: Measures and Incentives – Residential Online Audit

Measures	Measure Number	Incentive Amounts
CFLs	R-11	100%
Low Flow Fixtures	R-12	100%

Projected participation by year is shown in the table below.

Table 56: Estimated Participation and Savings – Residential Online Audit

Residential Online Audit				
Potential Participants				389,500
Per participant Savings (kWh):				321
Per Participant Savings (kW):				0.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,169	0.3%	375,249	97
2015	1,558	0.4%	500,118	129
2016	1,753	0.5%	562,713	145
Average	1,493	0.4%	479,360	123

Marketing Plans

The program will be marketed to residential households through normal customer communications and as a feature on the company website.

Program Tracking Considerations

Website activities should be utilized to populate a tracking database with comprehensive list of all recommendations made to participants. Savings assessments will be determined based on follow-up surveys and tracking of measures contained within the savings kits. This program will be used as a feeder to other programs.

Detailed Budget Plans

An estimated three-year budget for this program is provided below.

Table 57: Estimated Three-Year Program Budget – Residential Online Audit

Res Online Audit	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Program Costs						
Implementation & Other Annual Cost		$10,000	$10,000	$10,000	$30,000	5%
DSM Staffing		$69,863	$72,308	$74,837	$217,007	38%
Monitoring & Evaluation		$35,000	$35,000	$35,000	$105,000	19%
Variable Costs						
Incentives	$23	$26,887	$35,834	$40,319	$103,040	18%
Delivery & Other	$25	$29,225	$38,950	$43,825	$112,000	20%
Total Budget		$170,975	$192,092	$203,981	$567,047	100%

Program 18. Residential Appliance Recycling (CORE PLUS)

The recycling program improves the in-service technology mix for the service territory by removing energy hog appliances and deleting them from existence in an environmentally friendly way. Appliance recycling is available primarily through two national program vendors, both of which bring the necessary environmentally sound technologies and procedures to the program.

This program targets households with second refrigerators or freezers. The program will provide free refrigerator and/or freezer pick up. Once I&M receives verification that the refrigerator has been recycled, the customer will receive a $40 incentive.

Rationale

This program targets residential customers with second refrigerators or freezers, preferably those older than 1993. The program is designed to take these inefficient older refrigerators off the market entirely, and to do so in an environmentally-sustainable manner. I&M will pay a $40 incentive to each customer to help persuade them to get rid of the second refrigerator or freezer, and will also cover the cost associated with removing the refrigerator or freezer and recycling its components.

Participation and Measures

Measures are shown below.

Table 58: Measures and Incentives – Residential Appliance Recycling

Measure	Measure Number	Incentive Amount
Eliminate Old Appliances	R-9	$40

Projected participation is reported in the following table.

Table 59: Estimated Participation and Savings – Residential Appliance Recycling

Res Appliance Recycle				
Potential Participants				119,000
Per participant Savings (kWh):				1,009
Per Participant Savings (kW):				0.2
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,785	1.5%	1,801,065	378
2015	3,570	3.0%	3,602,130	755
2016	7,140	6.0%	7,204,260	1,511
Average	4,165	3.5%	4,202,485	881

Marketing Plans

This program will be marketed directly to consumers through bill inserts, direct mailing materials, and through refrigerator distributors. The program will need to mail information to customers on a regular schedule (twice a year basis, or more frequently as needed to produce the desired participation rates), and through point-of-purchase information at trade ally facilities.

Program Tracking Considerations

The program vendor will be required to supply a detailed database sufficient to demonstrate the age and condition of units picked up and also to demonstrate that the units are properly destroyed and recycled. In addition, the database should be sufficient to supply data necessary for program evaluation. Generally tracking for this program type begins with a photo of the refrigerator nameplate or attachment of an ID code sticker on pick-up, and tight tracking capability is required through disassembly to insure beyond question that there is never even a slight diversion of working units to the secondary market.

Detailed Budget Plans

An estimated three-year budget for this program is provided below. There are no costs to participating customers.

61

Table 60: Estimated Three-Year Program Budget – Residential Appliance Recycling

Res Appliance Recycle	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	2%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	4%
Monitoring & Evaluation		$90,000	$90,000	$90,000	$270,000	10%
Variable Costs						
Incentives	$40	$71,400	$142,800	$285,600	$499,800	19%
Delivery & Other	$140	$249,900	$499,800	$999,600	$1,749,300	65%
Total Budget		$466,231	$788,754	$1,432,619	$2,687,604	100%

Program 19. Residential New Construction (CORE PLUS)

This is a "beyond Energy Star" strategy for new residential construction. A second program element, Energy Star manufactured homes would have been included except that the relatively small stock and yearly increment of manufactured homes in I&M's Indiana service territory are too small to support a program.

Recent changes in Energy Star and the general success of Energy Star in improving the performance of baseline (Non Energy Star) new homes have negatively affected the cost-effectiveness of the standard Energy Star program. In the Energy Star program, there are many builder pathways (called Building Options Packages) to enable manufacturers to meet Energy Star criteria. Many Energy Star builders, in order to be sure of meeting the Energy Star criterion, now build beyond it. From a utility perspective, supporting "beyond Energy Star" homes is the only viable option to insure cost-effectiveness of this program element.

Two other certifications have been introduced into the home performance market. These are LEED and Passivehaus. The basic concept of the program is the "high performance" home. All such homes will be Energy Star Plus and some will also be LEED and Passivehaus certified. I&M should provide all three tracks.   The ultimate goal is the "net zero ready" home, which, with the addition of Solar PV from the renewable energy program will become net zero or even slightly revenue positive for the household, selling net energy back to the utility. This end goal will not be met by most homes in the program, but they can all be oriented towards this track.

Passive solar design and orientation reduce a home's heating and cooling costs and makes the home more comfortable. Better lighting and better internal temperature control are to be included.   The incremental cost of $3,000 per home plus a $500 inspection fee in the illustrative measure package represents a generalized measure package.

Rationale

The basic philosophy for the program should incorporate net-zero concepts. These include an expected measure life for the new house of 150 years and a net-zero plan. The plan for each house will provide elements of energy savings in the original construction plus a set of steps which may be taken later to move towards net-zero. The key feature of the plan is to order elements so no work impedes the future steps. PV, since it is not a DSM measure is not included

in this program but the goal is a house that is solar ready. A basic concept is the development of the customers as a repeat customer for additional increments or energy efficiency packages throughout the life of the structure.

Participation and Measures

Measures are shown below.

Table 61: Measures and Incentives – Residential New Construction

Measures	Measure Number	Incentive Amounts
Energy Star New Home (Building Options Package)	R-6	$1,500
Lighting and Appliance Bonus when 10 energy efficient fixtures and 3 labeled Energy Star appliances are included (or equivalent upgrade)		
Inspection Service Fee		$500

Projected participation by year is shown in the table below.

Table 62: Estimated Participation and Savings - Residential New Construction

Res New Construction				
Potential Participants				375
Per participant Savings (kWh):				4,222
Per Participant Savings (kW):				1.4
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	56	15.0%	236,432	77
2015	94	25.0%	396,868	130
2016	113	30.0%	477,086	156
Average	88	23.3%	370,129	121

Marketing Plans

The financial incentive is provided directly to homebuilders to help offset the additional cost to build an Energy Star home. This gives the incentive a multiplier of between two and three. This program element is a vendor-delivered program requiring an experienced Energy Star program

vendor. The program vendor provides all of the detailed knowledge and relationships to put the program in place with a restricted set of measures to reach savings levels significantly beyond Energy Star using a set of builder options packages. While the customer has higher first cost, the customer pays less for energy over the life of the home and on a life cycle basis comes out well ahead financially. The program vendor will also provide the established channels to national builders, establish relationships with local builders, and will come supplied with all manner of promotional materials.

The key, according to the Texas Energy Star program, is in promoting the value of the brand to builders who would like to differentiate their product. Marketing methods include:

1. Newspaper and real estate guide ads
2. Signage
3. Marketing materials
4. Builder and subcontractor training and ongoing technical assistance
5. Training in the advantages of Energy Star homes for all the builders, sales staff, realtors, and the lending community.
6. Seminars and literature targeted at consumers. This is a valuable addition to a marketing effort because consumers can create a market pull.

Key points to include in a beyond Energy Star program element are:[12]

1. Establish a single stable multi-year approach. This will give stability to builders and allow the program to grow more readily.
2. Establish a single, simple, and high program standard of efficiency. This is important because it lets builders know where they stand and what is expected.
3. Establish good relationships with area builders and developers.
4. Ensure that staff professionalism, delivery systems, equipment, marketing materials and quality assurance are all of high quality.
5. Maintain strict adherence to specifications based on sound building science and economics to maintain program credibility and consistency.
6. Establish a process for certifying and documenting homes built to requirements.[13]
7. Develop a solid infrastructure of experienced, well-known and respected organizations.

---

[12] Drawn from Vermont Energy Star Program, managed by Efficiency Vermont.
[13] Texas Energy Star Program.

65

8. Develop targeted incentives that are well coordinated with marketing and other service-related materials.
9. Coordinate with health and safety standards and codes for residential construction.
10. Provide ongoing technical training for builders and subcontractors.
11. Promote builders buy-in into the program by getting them financially invested in the program through advertising, building requirements, and training so they will support all aspects of the program.[14]
12. New construction is an excellent area to review for strategic combination of gas and electric energy efficiency measures.

Program Tracking Considerations

As Energy Star homes, Energy Star Plus homes are certified by HERS raters, and I&M will need to work with the HERS raters and the program vendor to establish a workable data tracking system. There are several models for this system, for example the "Dashboard" system developed by Paragon Consulting Services.

Detailed Budget Plan

An estimated three-year budget for this program is provided below. Costs to participating customers include the customer's outlay for any remaining incremental cost of the Energy Star Plus home.

---

[14] Texas Energy Star Program.

Table 63: Estimated Three-Year Program Budget – Residential New Construction

Res New Construction	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$10,000	$10,000	$10,000	$30,000	3.7%
DSM Staffing		$34,931	$36,154	$37,419	$108,504	13.3%
Monitoring & Evaluation		$50,000	$50,000	$50,000	$150,000	18.4%
Variable Costs						
Incentives	$1,500	$84,000	$141,000	$169,500	$394,500	48.4%
Delivery & Other	$500	$28,000	$47,000	$56,500	$131,500	16.2%
Total Budget		$206,931	$284,154	$323,419	$814,504	100%

Program 20. Residential Neighborhoods (CORE PLUS)

This program is targeted primarily to households at or below 150 percent of poverty. The program involves identification of a specific neighborhood with approximately 60 percent low-income customers which is approached through local leaders and an organized effort to secure community participation.

The program provides a set of low-cost/no-cost energy saving homes in the neighborhood. This service will be provided to all homes, including low-income and non low-income homes. Gas customers are provided with energy efficient lights (CFLs, LEDs and/or halogens). Electrically heated homes will receive lighting measures, low-flow fixtures and some portion will receive infiltration reduction treatment. Though administered through a program delivery vendor, the program requires staff involvement in community meetings and events.

The program concentrates services in a neighborhood blitz and with local recognition to minimize cost. It then moves on to another neighborhood. By concentrating on lower income neighborhoods and rural communities, the program serves mainly low-income customers. However, in keeping with the community approach all homes in the neighborhood are offered service.

Participation and Measures

Measures are shown in the table below.

Table 64: Measures and Incentives – Residential Neighborhoods

Measures	Measure Number	Incentive
House Sealing using Blower Door	R-5	100%
Efficient Residential Lighting	R-11	100%
Low Flow Fixtures	R-12	100%
Tank Wrap, Pipe Wrap & Water Temp Setpoint	R-13	100%

Participation is expected to begin with the selection of one or two neighborhoods, and then be expanded to additional neighborhoods. Projected participation by year is shown in the table below.

Table 65: Estimated Participation and Savings – Residential Neighborhoods

Residential Neighborhoods				
Potential Participants				210,300
Per participant Savings (kWh):				583
Per Participant Savings (kW):				0.1
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	1,262	0.6%	735,746	189
2015	2,103	1.0%	1,226,043	315
2016	3,155	1.5%	1,839,365	472
Average	2,173	1.0%	1,267,053	325

Marketing Plans

Marketing is approached through community social relations in a neighborhood application with the support of community leaders. Generally, a community meeting or community dinner will be included. Application will be in a house by house blitz.

Program Tracking

Data collection and documentation for program purposes and annual reporting will require a tracking system so that measures installed can be tracked by relevant household classification variables.

Budget Assumptions

The budget for this program will be refined with experience. In several ways, this is a social marketing program rather than a traditional marketing program in that it is community based. This means there will be overhead for working with local officials and community leaders and for community events such as a dinner.

Table 66: Estimated Three-Year Program Budget – Residential Neighborhoods

Residential Neighborhoods	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	4%
DSM Staffing		$36,225	$37,493	$38,805	$112,522	7%
Monitoring & Evaluation		$75,000	$75,000	$75,000	$225,000	13%
Variable Costs						
Incentives	$147	$185,893	$309,772	$464,732	$960,396	57%
Delivery & Other	$50	$63,100	$105,150	$157,750	$326,000	19%
Total Budget		$380,218	$547,415	$756,286	$1,683,918	100%

Program 21. Residential Home Reports (CORE PLUS)

The Home Energy Comparison Report is a periodic comparative usage report that compares customers' energy use relative to similar residences in the same geographical area and which also gives customers specific energy savings recommendations to encourage energy saving behavior. The reports are typically mailed quarterly but the pattern may be altered by the program manager. The recommendations may be accompanied by coupons and links to other Company programs and to a website that promotes energy efficiency opportunities. The program has been tested as a pilot in South Carolina, where it was limited to individually metered, owner-occupied single family homes. The pilot showed approximately 2 percent overall energy savings for the pilot participants as compared to a control group of non-participants. According to the evaluation study, customers who reduced energy use tended to live in homes that had higher energy consumption and customers who increased energy use tended to live in homes with lower energy consumption compared with average homes. Based on pilot results, expansion to a full scale program will use information on homes that lowered use and homes that increased use for targeting and for testing messaging content to improve program performance.

Rationale

Customer Reports programs have emerged since 2007 and are being introduced by several utilities and other DSM administrators. They are often referred to as "behavioral" programs since the program theory is that careful messaging will influence energy savings behavior and because the first generation of these pilot programs studied only the messages and the net energy savings with respect to the control group. Only much more recently have the physical mechanisms causing energy savings been a subject of program research. Behavior, for example, may be as simple as changing energy use habits and patterns. Or it may be the purchase of an energy efficient appliance. It could be participation in one of the Company's other DSM programs. This program differs from all other DSM programs because it is not designed to provide meaningful savings to individual households. An average savings of 2 percent is well within the range of normal year to year variation in household energy use ("noise"), and the pattern of reduction for high use homes coupled with increase for low use homes is the typical pattern of regression to the mean. However, if the 2 percent savings can be shown to hold up over time as a contrast between a treatment group and a control group (with both groups determined by random assignment under control of a third-party evaluator rather than the Company or a program vendor or implementer) the result is meaningful and sizable at the system level on a one-year savings basis.

Participation and Measures

There is one measure, the Customer Report. However, the reports may be delivered with different frequencies, and messaging may be tested to achieve best results.

Table 67: Measures – Residential Home Reports

Measures – Kit Items	Measure Number
Residential Home Report	R-16

Table 68: Estimated Participation and Savings – Residential Home Reports

Potential Participants				194,750
Per participant Savings (kWh):				193
Per Participant Savings (kW):				0.05
Program Year	Incremental Participants	Percent Participation	kWh Saved	kW Saved
2014	38,950	20.0%	7,517,350	1,930
2015	38,950	20.0%	7,517,350	1,930
2016	38,950	20.0%	7,517,350	1,930
Average	38,950	20.0%	7,517,350	1,930

The knowledge base for messaging is similar to that for corporate communications and traditional marketing and promotion programs.

This program type is unique in that it presents no dollar cost that is apparent to customers and participation is assigned by the utility (with provision for opt-out) as a part of the program design. As this program matures, different groups of customers may be targeted for participation.

Marketing Plans

Since the program content is marketing and promotion/corporate communications there is not a special marketing plan other than the actual Customer Reports. Instead, the program manager

will determine which customers should be included and which excluded from the program (targeting). Then the total group eligible for the program will be split using random assignment conducted by the third party independent evaluator. This will provide a treatment group and a control group. The treatment group will receive the messaging; the control group will not. Possibly the program manager will decide to form more than one treatment and/or control group. In that case, the key feature is always random assignment from a pool of eligible customers to the various groups. Also, frequency of reports may be quarterly or varied.

Program Tracking

Data collection and documentation for program purposes and annual reporting will require a tracking system. This will require careful tracking of group members, attrition, and of messages and frequency. In addition, an effort will be conducted to determine the physical causes of energy savings and customer costs.

Budget Assumptions

Costs to participating customers will be customer's time and any incremental costs due to selection of energy-efficient appliances or home improvements. Company costs will be limited to the communications, the tracking system, and determining the actual customer costs. An estimated three-year budget for this program is provided below.

Table 69: Estimated Three-Year Program Budget – Residential Home Energy Reports

Residential Home Report	Cost/ Participant	2014	2015	2016	3-Yr Total	% of Total
Fixed Costs						
Implementation & Other Annual Cost		$20,000	$20,000	$20,000	$60,000	4%
DSM Staffing		$25,875	$26,781	$27,718	$80,373	5%
Monitoring & Evaluation		$40,000	$40,000	$40,000	$120,000	7%
Variable Costs						
Incentives	$0	$0	$0	$0	$0	0%
Delivery & Other	$12	$467,400	$467,400	$467,400	$1,402,200	84%
Total Budget		$553,275	$554,181	$555,118	$1,662,573	100%

The Measures

The first question about measures is whether there should be a Measures section in a Program Action Plan now that there is a fully completed Indiana Technical Resource Manual (TRM). An alternative would be to simply reference all measures to the TRM. But each team developing Program Action Plans brings its own experience and this experience will color to some degree how certain measures are understood in the ex ante planning process. Where there are differences of perspective, the planning process for Program Action Plans is one of the key places where discussions of possible changes to the TRM will arise.

The purpose of this section is to provide documentation of the assumptions used to screen the Energy Efficiency Measures (EEMs) identified for consideration in this report. Our assumptions are based on references cited throughout this section as well as the direct experience of our team with technologies in the field and actual DSM program evaluations. While not all of the field and DSM program experience can be cited in published works, published references are used to establish a reasonable range of assumptions. The point estimate used within that range is based on our professional opinion. For the most part, since the Indiana TRM now exists, measure characteristics have been conformed to the Indiana TRM.

The mapping of EEMs to Residential DSM programs is shown in the table below by the value listed in each cell. The value represents the percentage of participants installing the measure. Cells with no value mean the measure is not included in the program.

Measure Maps

The mapping of EEMs to DSM programs is shown in the following tables. Measures are listed down the side of each table; programs are listed across the top. The Residential table is shown first, followed by the Commercial & Industrial table.

The values represented in each table are the percentage of participants installing each measure. Cells with no value mean the measure is not included in the program.

Table 70: Residential Measure Map.

RESIDENTIAL PROGRAMS: MEASURE MAPPING

Residential Program No.			10	11	12	13	14	15
End-Uses	EEM Description	EEM Ref #	Residential Home Energy Audit	Residential Lighting	Energy Efficient Schools - Education	Income Qualified Weatherization	Residential Weatherization	Moderate Income Weatherization
Residential Space Conditioning	Wall Insulation (R3-R11)	R-1					0.30	0.20
	Ceiling Insulation (R6-R30)	R-2				0.21	0.45	0.85
	Programmable Thermostats	R-3					0.20	
	Refrig Charge/Duct Tune-Up	R-4				0.35	0.10	0.35
	House Sealing Using Blower Door	R-5				1.00	0.90	1.00
	Energy Star Construction	R-6						
	Cool Roofs	R-7						
	Elec Heat to SEER 16 H Pump	R-8						
Load Management	Eliminate Old Appliances	R-9						
Residential Appliances	Energy Star Clothes Washers	R-10						
Residential Lighting	Efficient Residential Lighting	R-11	1.00	1.00	1.00	1.00		1.00
Water Heating	Low Flow Fixtures	R-12	0.25		0.25	0.25	0.15	0.85
	Tank Wrap, Pipe Wrap and Water Temp Setpoint	R-13	0.15			0.45	0.10	0.45
	Heat Pump Water Heaters	R-14						
Miscellaneous Technologies	Ductless Heat Pump	R-15						
	Customer Report	R-16						
	Smart Plug	RC-1				1.00		

Note: Values in the table represent the percentage of participants receiving the measure.

RESIDENTIAL PROGRAMS: MEASURE MAPPING

Residential Program No.			16	17	18	19	20	21
End-Uses	EEM Description	EEM Ref #	Residential EE Products	Residential Online Audits	Residential Appliance Recycling	Residential New Construction	Residential Neighborhoods	Residential Home Reports
Residential Space Conditioning	Wall Insulation (R3-R11)	R-1						
	Ceiling Insulation (R6-R30)	R-2						
	Programmable Thermostats	R-3						
	Refrig Charge/Duct Tune-Up	R-4						
	House Sealing Using Blower Door	R-5					0.15	
	Energy Star Construction	R-6				1.00		
	Cool Roofs	R-7	0.04					
	Elec Heat to SEER 16 H Pump	R-8	0.04					
Load Management	Eliminate Old Appliances	R-9			1.00			
Residential Appliances	Energy Star Clothes Washers	R-10	0.20					
Residential Lighting	Efficient Residential Lighting	R-11		1.00			1.00	
Water Heating	Low Flow Fixtures	R-12		0.25			0.90	
	Tank Wrap, Pipe Wrap and Water Temp Setpoint	R-13					0.12	
	Heat Pump Water Heaters	R-14	0.05					
Miscellaneous Technologies	Ductless Heat Pump	R-15	0.08					
	Customer Report	R-16						1.00
	Smart Plug	RC-1						

Note: Values in the table represent the percentage of participants receiving the measure.

77

Table 71: Commercial & Industrial Measure Map.

COMMERCIAL & INDUSTRIAL PROGRAMS: MEASURE MAPPING								

Commercial & Industrial Program No.			4	5	6	7	8	9
End-Uses	EEM Description	EEM Ref#	C&I Rebates	Energy Efficient Schools - Audit	Retro-Commissioning Lite	HVAC and Refrigeration Optimization	C&I Audit	C&I Custom
Customer-Sited Generation	Combined Heat and Power, CHP	C-1						*
C&I Space Conditioning	Small HVAC Optimization and Repair	C-2				0.90		*
	Retro-Commissioning Engagement	C-3			1.00			*
	Low-e Windows 1500 ft2	C-4						*
	Premium New HVAC Equipment	C-5						*
	Large HVAC Optimization and Repair	C-6						*
	Window Film	C-7	0.05					*
	Integrated Building Design	C-8						*
Design	Efficient Package Refrigeration	C-9	0.10					*
Motors and Drives	Electronically Commutated Motors	C-10	0.10					*
	Premium Motors	C-11	0.10					*
	Motor Controls and Motor Applications Tune-Up	C-12						*
	Single Application VFD	C-13	0.15					*
Power Distribution	Energy Star Transformers	C-14	0.02					*
	Efficient AC/DC Power	C-15						*
Lighting	LED Outdoor Lighting	C-16						*
	New Efficient Lighting Equipment	C-17	0.10					*
	Retrofit Efficient Lighting Equipment	C-18	0.90	1.00				*
	LED Exit Signs	C-19	0.05	1.00				*
	LED Traffic Lights (10)	C-20	0.05					*

78

COMMERCIAL & INDUSTRIAL PROGRAMS: MEASURE MAPPING

Commercial & Industrial Program No.			4	5	6	7	8	9
End-Uses	EEM Description	EEM Ref#	C&I Rebates	Energy Efficient Schools - Audit	Retro-Commissioning Lite	HVAC and Refrigeration Optimization	C&I Audit	C&I Custom
	Small Commercial LED Change out	C-21					0.85	*
	Perimeter Daylighting	C-22						*
Water Heating	Low Flow Fixtures	C-23	0.01					*
	Solar Water Heaters	C-24						*
	HP Water Heaters	C-25						*
Cooking and Laundry	HE Food Prep and Holding	C-26						*
	Energy Star Commercial Clothes Washer	C-27						*
	Restaurant & Grocery Audit	C-28					1.00	*
Other	Grocery Refrigeration Tune-Up and Improvements	C-29				0.05	0.25	*
	Refrigeration Casework Improvements	C-30				0.10	0.20	*
	VendingMiser® and Vending Machine Timers	C-31	0.05	0.05				*
	Network Computer Power Management	C-32						*
	Solar Electric	C-33						*
	Smart Strips	RC-1		1.00				*

Note1: Values in the table represent the percentage of participants receiving the measure.
Note2: The asterisk in the column for Program 9 (C&I Custom) indicates the measures that may appear in this program.

Residential Measures

Wall Insulation (R-1)

This measure involves increasing wall insulation from R-3 and adding insulation to the R-11 level. This measure saves both heating and cooling energy. In the case of gas heated residences, the electric savings are for cooling only and are much less than the heating savings. Therefore the cost effective application of this measure is for electrically heated residences only.

Measure Applicability

This measure is considered applicable to a portion of the 24 percent of residential customers that heat with electricity. Of these customers, about 5 percent have heat pumps and live in more recent stock that is probably insulated. Of the remaining 17 percent, we will assume that half are poorly insulated and could benefit from this measure. Overall the applicability is taken as 8 percent of the residential sector.

Incremental Cost

This measure contemplates adding wall insulation to a 2x4 stud wall where there is none. We assume a cost of $1.25 per square foot of wall area. DEER uses a value of $1.32 per square foot of wall area. The DEER values are based on going from an R-0 to an R-13; the equipment costs are given as $0.15 for equipment and $1.17 for labor resulting in the overall cost of $1.32. Our estimate is more conservative. The total installed cost for the home modeled is $1,400.

Average Annual Expected Savings

Savings from this measure are strongly dependent on the efficiency of the electric heat source. The stock to which this measure is applied consists primarily of electric furnaces. Therefore the simulations assume the displacement of resistance heat. Building simulations show savings of 1885 kWh to 2600 kWh/yr for electric-heated residences and less than 400 kWh/yr for gas-heated residences. For this analysis the annual savings will be taken as 2,100 kWh/yr for electric-heated residences and 400 kWh/yr for gas-heated residences.

Expected Useful Life

This analysis uses an effective useful life of 25 years, the DEER uses 20 years.

Ceiling Insulation R6-R30 (R-2)

This measure involves increasing ceiling insulation from R-6 to the R-30 level. This measure saves both heating and cooling energy. In the case of gas heated residences, the electric savings are for cooling only and are much less than the heating savings. So the cost effective application of this measure is to electric heated residences only.

Measure Applicability

This measure is considered applicable to a portion of the 24 percent of residential customers that heat with electricity. Of these customers about 5 percent have heat pumps and live in more recent stock that is probably insulated. Of the remaining 17 percent we will assume that half are poorly insulated enough to benefit from this measure. Overall the applicability is taken as 8 percent of the residential sector.

Incremental Cost

We assume a cost of $0.75/square foot of wall area and 1000 square feet of wall space for a total cost of $750. DEER uses a value of $0.757/square foot of wall area. This job includes the cost of providing for adequate attic venting.

Average Annual Expected Savings

Savings from this measure are strongly dependent on the efficiency of the electric heat source. The stock to which this measure is applied consists primarily of electric furnaces. Therefore the simulations assume the displacement of resistance heat. Building simulations from I&M specific weather data show savings of 1,500 kWh to 2,700 kWh/yr for electric heated residences and less than 400 kWh/yr for gas-heated residences. For this analysis, the annual savings is assumed to be 1,500 kWh/yr for electric-heated residences and 300 kWh/yr for gas-heated residences.

Expected Useful Life

This analysis uses an effective useful life of 25 years.

Programmable Thermostats (R-3)

Programmable thermostats save energy by lowering the average daily temperature of the inside of a building. Most of the energy savings is heating energy because that heating thermal load is much larger than the cooling load, but some energy savings in cooling energy will also be realized. Programmable thermostats are commonly sold for self installation. But the installation has the following four important issues that need to be considered.

1. Some thermostats are line voltage thermostats, and there is some shock hazard to the unaware.
2. The first step in programming a thermostat is the system specification. Here the installer tells the thermostat what kind of a system it is controlling. The system type is selected from a list of about 30-50 different system types. This is a non-obvious choice.
3. For system controls there are standard colored wires, but often hookups use non-standard wire. For the mechanically inclined this process is okay but for others it is daunting.
4. Then, after it is installed successfully there is the issue of controlling it to get satisfactory results. Sometimes this needs a guiding hand.

The US DOE is phasing out programmable thermostats from the Energy Star program. Evaluation studies have found insufficient savings to warrant the Energy Star designation. Proper installation and operation appear to be at the root of the lack of energy savings. We have chosen to leave these devices in our mix of EEMs and feel that with proper installation and setup the technology is sound. Our incremental cost includes the cost of installation over and above the off-the-shelf cost of programmable thermostats. Even with proper installation, there is an ongoing need for a design that is more user-friendly and easier to operate.

Measure Applicability

The I&M Appliance study shows 23 percent of the respondents reported the use of a programmable thermostat. Also the Appliance Study reports 23 percent have electric heating in the form of resistance heat or heat pumps. It is not clear if the reported programmable thermostats were all on electric heating situations. For this analysis 20 percent of treated homes are taken as good candidates for a new programmable thermostat.

Incremental Cost

Programmable thermostats cost retail in the range of $50-$100. A utility program may be able to purchase in bulk. It may be necessary to have a range of options which include at least line voltage and low voltage. For these purposes we take $70 as the melded cost of the thermostats.[15] It is assumed here that thermostats will be installed as part of a site visit in a broader program with $25 allocated for installation labor. In total the installed cost will be taken as $120 per thermostat.[16] Some sites with line voltage thermostats may require more than one thermostat.

---

[15] DEER lists the incremental cost as $56.3, and the installed cost as $73.33 per unit.

[16] DEER lists the incremental cost as $73.33 of which $56.37 is equipment cost and $16.96 in labor. This analysis uses $50 for the labor cost which accounts for some of the difference in the costs.

Average Annual Expected Savings

Thermostat savings are best realized when the set back interval is of the order of 8 hours or longer, and the amount of savings depends on the number of degrees the thermostat is set back. The rule of thumb is one percent heating savings for every degree the thermostat is set back for at least 8 hours. For this estimate a five degree thermostat set back is assumed, leading to heating savings in the average electrically heated home of 500 kWh/yr.

Expected Useful Life

In principle, these thermostats can last for in excess of 20 years, but the backup batteries have a finite life and the programming can be changed or confused. In this case, the effective lifetime will be taken as 10 years.[17]

---

[17] DEER list the EUL as 12 years.

Refrigeration Charge and Duct Tune-Up (R-4)

This measure is designed to save electric energy by increasing the operating efficiency of the refrigerant system by insuring that it is properly charged. It is common in residential cooling or heat pump systems to have an incorrect amount of refrigerant charge because these systems are usually charged on site during installation. This measure also leads to significant savings from finding and sealing duct leaks which increases the system distribution efficiency.[18]

Measure Applicability

This measure is applicable to most of the residential stock. Notably even new installations can benefit from this measure.

Incremental Cost

The incremental cost of this measure pays for a visit by a specially trained HVAC technician. For this analysis this cost is taken as $350.

Average Annual Expected Savings

The average annual expected savings from this measure depends on the size of the residence. Based on I&M specific simulations we find savings of 1,200 kWh/yr for a heat pump (electrically heated residence) and 300 kWh/yr on a gas heated residence with AC only.

Expected Useful Life

This is essentially a tune-up measure and is considered here to have a useful life of 5 years.

---

[18] While these measures are theoretically handled by different trades, in practice they are implemented by a specially trained HVAC technician. This combination is efficient from a cooling system perspective and also typically cost-effective.

House Sealing Using Blower Door (R-5)

This measure applies to residential electrically heated properties. It involves using blower door technology to pressurize the home. Once the house is pressurized, the air leaks are identified and sealed with appropriate materials to decrease heat loss from the building envelope.

Measure Applicability

This measure is applicable to most of the residential stock.

Incremental Cost

The incremental cost of sending a technician to a home and performing a Blower Door test and sealing the identified leaks is assumed here to be $500. By comparison, the C&RD database lists $0.16 per 0.1 air change per square foot which translates to $500 per house with 0.2 air changes per square foot.

Average Annual Expected Savings

An electrically heated home will achieve 1,000 kWh in annual savings according to our modeling, and a gas home will save 200 kWh annually.

Expected Useful Life

The life of the savings for this measure depends on the quality of the materials used especially for the gaskets for the windows and doors. An expected useful life of 15 years is assumed by the Indiana TRM.

Energy Star Construction (R-6)

An Energy Star qualified new home is required to be 15 percent more efficient than a similar home that meets the 2004 International Energy Conservation Code, IECC. The mechanism for estimating Energy Star compliance is through the use of a Home Energy Rating System (HERS) score calculated from a brief estimate of annual energy use. The savings proceed principally from heating, cooling, lighting and water heating savings.

Measure Applicability

This measure is applicable to all new residential construction. But for the purposes of this study the measure is restricted to new residential all electric construction, estimated here to be 40 percent of new construction.

Incremental Cost

The incremental cost for this measure consists of the increased cost of building components such as insulation, windows, lighting and appliances. This cost is site specific, and there is some choice in selecting the package of measures. An initial cost effectiveness screening of this measure showed that the maximum cost effective cost is $3,000. This requires composing a package of only the most cost effective measures. Therefore this package includes the strongly cost effective measures of flow efficient showerheads and inspection and checkout of heat pumps that are not commonly part of the Energy Star package (but should be). Based on the choice of the most cost effective measures, the cost used for this study is $3,000.

Average Annual Expected Savings

The savings from this measure are variable depending on the particular site treatment chosen, but estimates for this region are in the range of 3,000-4,500 kWh/yr. For this study, the savings is assumed to be 4,223 kWh/yr.

Expected Useful Life

This measure has a useful life comparable to that of new construction and for this study the life will be taken as 25 years.

Package Detail New Residential Energy Star Plus

Program planning for an assumed package of energy star plus treatments has used a model of a prototypical all electric participant. Using this model the full package of measures is examined to estimate the energy savings for the individual measures in the package.

The energy star new residential achieves energy savings principally through improvements to the building shell and reductions in interior appliance energy use.

As perspective consider an all electric single storey residence of about 1,900 square feet. This residence is heated and cooled by a SEER 13 heat pump which is the current standard.

The Energy Star package consists of three common sense building steps. First the thermal conductivity of the envelope is reduced by small coordinated improvements to the building shell, better glazing, selective

increase to insulation levels, and by attention to air sealing and framing details. Then the performance of the heating cooling systems is improved by duct insulation and testing. Finally, the internal energy use is reduced by using efficient lighting, appliances, and showerheads. None of these improvements is extreme, but taken together these small improvements can result in an approximate 20 percent reduction in annual energy use. This is the core of the Energy Star Plus savings.

Another 5 percent reduction in energy use is possible if the residence is oriented to use solar gain to offset winter heating. And a further 5+ percent reduction in energy use can be achieved through the use of a SEER 15 rated heat pump. Another 10 percent savings is possible through the use of solar hot water heating, and another 10 percent reduction is possible by applying a modest solar PV array. These further reductions are all beyond the core Energy Star package, and only the first, the solar site orientation is cost effective currently. The further enhancements from a more efficient heat pump and other solar applications are quite reliable and effective, but beyond the current cost effectiveness horizon.

In practice each building is unique, and slightly different packages of improvements to shell and appliances are selected based on specific circumstances, but the savings will break down approximately as in Table 72. In this example the annual energy use for an all electric residence has been reduced from about 19,400 kWh/yr to about 15,600 kWh/yr, about a 20 percent reduction by core energy star measures alone and another 5 percent through solar site orientation.

Table 72. Energy Star Plus Residential Savings Example

Efficiency Category	Annual Savings, kWh/yr	How Achieved
Shell Improvements	1,600	20% reduction in thermal loss, shell and infiltration
Hot Water Improvements	700	2.0 gpm showerhead
Duct Improvements	585	Insulation and leak testing
Efficient Appliances	945	Efficient light, washer, dishwasher, an average 20% reduction in internal loads
Solar Site Orientation	1,050	Enhanced south glazing

The Energy Star Plus package consists of the efficiency measures noted in Table 73.

Table 73. Energy Star Plus Savings Measures

Shell insulation
Duct insulation and leak testing
Three energy star appliances including efficient lighting and an energy star clothes washer
A 2.0 gpm rated shower head(s) and faucet aerators
Whole house air sealing details

In the case of a residence with gas heat and hot water heating, the efficient appliance and cooling savings are the same with the shell and hot water improvements resulting in gas savings.

Cool Roofs (R-7)

This measure is intended to save cooling energy by reducing the temperature in the attic through attic ventilation and through the use of optically reflective roofs. Recent improvements in roofing have led to roofing in attractive architectural colors that can reflect solar gain almost as well as white or reflective roofs. This reflection of solar gain along with adequate attic ventilation can lower attic temperatures significantly thereby reducing heat gain to the home and also improving the distribution efficiency of any ductwork or distribution fans that are located in the attic space. Attic cooling lowers the thermal gain to the residence below, and it also improves the distribution efficiency of any attic duct work. At least half the cooling savings attributable to this measure proceed from the improved distribution efficiency, and therefore this measure is intended for application where there are attic ducts or distribution fans. This is essentially a site built measure including the installation of roof vents and the installation of several hundred square feet of reflective material to the inside of the roof rafters.

Measure Applicability

This measure is considered applicable to all new roofing applications. It is especially effective for central air conditioning applications with distribution ductwork in the attic. According to the appliance survey 92 percent of residences have central AC, and of these 15 percent are assumed to have attic ductwork. Overall the applicability is taken as 92 percent of the residential sector.

Incremental Cost

The incremental cost for this measure is taken to be the incremental cost of the Energy Star Qualified roofing which is reported to be currently \$0.23/square foot, but which is expected eventually to be zero. All other roofing costs and required ventilation are assumed to be unchanged by this measure. For this study we will take the incremental cost to be an average of \$0.10/ square foot over the five year planning period. For the average residence, \$340.

Average Annual Expected Savings

The savings from this measure proceed from lowered cooling energy by reducing ceiling heat gain. According to DOE, ceiling heat gain accounts for 15-25 percent of the residential cooling load. The radiant barrier has been observed to reduce ceiling heat gain by 16-42 percent. The cool attic strategy also improves cooling distribution efficiency if the cooling ducts or fan unit is in the attic. For this study we will take the average annual savings to be 560 kWh/yr. Savings larger than these will be found in the extreme cases with poorly insulated air conditioning distribution located in the attic spaces.

Expected Useful Life

This measure consists of reasonably durable material installed in an attic. The useful life is assumed to be 12 years.

Resistance Electric Heat to SEER 16 Heat Pump (R-8)

This measure is designed save heating energy and cooling energy by replacing an existing central air conditioner/electric furnace by a modern heat pump. Most of the savings proceed from replacing resistance heating by a heat pump at more than twice the thermal efficiency. This measure has significant savings, but also significant costs because it involves replacing the whole heating and cooling system, not including ducts.

Measure Applicability

This measure is applicable to about 17 percent of the residential sector that heats with an electric (resistance) furnace.

Incremental Cost

This measure requires replacing the whole heating/cooling system not including ducts. The cost of such a replacement is quite site specific, but can be expected to be a first cost of $10,000 or more. There are two contexts for such a replacement: 1) early retirement in-order to achieve large heating savings, and 2) where the central AC needs to be replaced anyway, the most prudent thing would be to replace with a heat pump because of its significant heating savings. The upgrade to a heat pump can be expected to cost about $5,500-$6,500 more than the AC replacement alone. For this analysis we assume $10,000 as the incremental cost.

Average Annual Expected Savings

The average annual expected savings from this measure depends on the size of the residence. Based on I&M specific simulations we find savings in the range of 8,000 kWh/yr for a single family residence and 6,470 kWh/yr in the multifamily application.

Expected Useful Life

The physical life of this measure is about 20 years, but for the purposes of this analysis we will take 15 years as the useful life of this measure to reflect the application of this measure in an early retirement context.

Eliminate Old Appliances (R-9)

This measure involves creating electric energy savings by collecting and dismantling underused older refrigerators and freezers. Ideally only operating or operable appliances would be eligible for removal.

Measure Applicability

This measure is applicable to the approximately 28 percent of the residential sector that have more than one refrigerator or freezer. Of these only 50 percent are assumed to have an interest in the program. For this study the applicability will be taken as 14 percent of the residential sector.

Incremental Cost

The incremental cost of this measure will be taken as the cost of acquiring and recycling the unit. For this study that cost will be assumed to be $165.

Average Annual Expected Savings

Savings from this measure are dependent on the age of the refrigerator and the location where it is used. Savings estimates for this measure also need to include the zero effects of including operable but not operating refrigerators. Reported savings estimates vary widely from an astonishing 1,900 kWh/yr for C&RD to 413 kWh/yr observed in the Connecticut Appliance Turn-In program. For this program, the savings will be assumed to take the middle road, 1,150 kWh/yr.

Expected Useful Life

The useful life of this measure is the length of time the removed refrigerator would have continued to be used absent the program. There is no reliable research on this and for this program the useful life will be taken as 5 years.

Energy Star Clothes Washers (R-10)

This measure involves obtaining an Energy Star clothes washer which is a more efficient clothes washer than a standard clothes washer. This measure has significant water and detergent savings in addition to the electric savings. According to the Environmental Protection Agency, horizontal-axis washing machines can use about 40 percent less water and 50 percent less energy than conventional washers, cause less wear and tear on clothes, and can accommodate large items that won't fit in a top-loader. A typical top-loading washer uses about 40 gallons of water per full load. In contrast, a full-size horizontal axis clothes washer uses between 20 and 25 gallons.

Measure Applicability

This program applies only to customers who have electric water heaters, electric dryers, and who have no high efficiency clothes washer. This applies to 40 percent of I&M customers.

Incremental Cost

The incremental cost for clothes washers vary significantly depending on the features. The value used in this analysis is $400; DEER uses a value of $565.82 and the C&RD lists a value of $245.26. Due to the wide variety of costs for Energy Star clothes washers $400 is a good mid-range value for the purposes of this analysis.

Average Annual Expected Savings

The kWh savings from a clothes washer depend to a significant extent on the source of the water heating and dryer's energy source. If the water heater is a gas water heater the kWh savings are insignificant but if the source is an electric water heater the savings can be substantial. Savings also depend on whether the clothes washer has a built in heat source which some do have. This analysis used 400 kWh. DEER lists 199 kWh and C&RD lists a range from 54 kWh to 509 kWh depending on the model chosen. Savings will be assumed to be 400 kWh because the program will be limited to customers with electric water heat and electric dryers.

Expected Useful Life

The expected useful life used in the analysis is 18 years; however, both DEER and C&RD use 14 years.

Efficient Residential Lighting (R-11)

This measure consists of substituting compact fluorescent lighting for incandescent lighting. At each socket treated, such a substitution will reduce lighting power by about 80 percent. A full application of this measure consists of converting all the most used lighting fixtures from incandescent to compact fluorescent. Housing audits taken over the last 10 years show that an average house has about 25-45 lighting sockets with an aggregate connected incandescent lighting load of about 2,700 watts. But of this load, only about 10-15 sockets are used for about an average of 5 hours/day, the rest are infrequently used. So it is the ten-fifteen most frequently used sockets that are the primary targets for a whole house lighting conversion. A satisfactory conversion of these most important sockets may require recourse to a variety of bulb styles, powers, and even adapters (such as lamp harps) to facilitate accommodating the CFL to these ten best locations.

Measure Applicability

This measure is applicable in 100 percent of residential sector, but to allow for some existing use of compact fluorescents this study will use 95 percent as the applicability factor for this measure.

Incremental Cost

The cost for this technology continues to decrease, and there are various sales or promotions where the cost may be as low as $1.50/bulb. But for the purpose of this program planning we will use the Indiana TRM value of $3.00/average bulb to cover the costs of compact fluorescent bulbs, and $14.00/bulb for 10.5 watt LED bulbs. Full application of this measure, assuming treatment as directed within program guidelines vary with the number and types of bulbs installed per household.

Average Annual Expected Savings

Expected savings are dictated by the Indiana TRM. For CFL bulb applications the typical per bulb annual savings for a direct install measure is taken to be 41 kWh per year. A typical LED bulb installation produces a savings of 32 kWh per year.

Expected Useful Life

Compact fluorescent bulbs have a life time of 10,000 hours, about 7-10 times as long as the incandescent bulbs they replace. Assuming the average compact fluorescent bulb is used 2,000 hours/yr (5-plus hours/day) gives a conservative estimate of useful life of 5 years. LED bulbs have a deemed lifetime of 15 years per the Indiana TRM.

Special Note

The United States (along with many other countries, including China and Australia) is phasing out inefficient bulbs. The US law (Clean Energy Act of 2007) holds that certain light bulbs must be 25% to 35% more efficient by 2012 to 2014. Certain bulbs are excluded (those lower than 40 Watts and those over 150 Watts, also specialty lights, appliance lamps, "rough service" bulbs, three-way bulbs, colored lamps, and plant lights). This means that traditional 60 Watt and 100 Watt incandescent bulbs will gradually become unavailable unless the underground economy expands to meet preferences of customers who do not desire to make the change. Also, from 2012 through 2014, government pro-CFL promotions, along with promotions by big box stores, advocacy by environmental groups, and climate change

organizations, as well as some religious organizations will encourage reliance on CFLs and LEDs. From a "reason analysis" perspective, it is likely that people will increasingly say they would have purchased CFLs in the absence of a utility program, or that the percentage of influence of the utility program on their decisions to purchase CFLS will be radically declining. At the same time, just because a law has been put into place does not mean that it is enforceable (for example, some states have progressive building standards, but they are not reflected in current practice). Currently (in 2013) 60 Watt and 100 Watt bulbs are available in any quantity via the Internet.

The time will come for utilities to withdraw from the CFL area, at least for 60 Watt and 100 Watt bulbs. However, we recommend that CFL programs be continued until it is clear that there is general public acceptance of CFLs, through 2017. We suggest that I&M discuss with the Commission a temporary modification of the TRC test for CFLs to emphasize *gross* energy savings rather than *net* energy savings (the focus here is on removing the "free rider" label from customers who are jointly influenced). This negotiation is necessary due to the joint influence on purchasing decisions which is complex.

What has become clear in socket studies is that there is a huge number of sockets without CFLs or LEDs; also that households tend to purchase only some CFLs and moving household beyond a certain number of sockets does not create free riders (for those additional CFLs) even if the household already has some CFLs. If the Commission is unable to agree to move towards gross savings for 60 Watt and 100 Watt CFLS, I&M should evaluate the financial risk and terminate the CFL effort earlier.

Low Flow Fixtures (R-12)

This technology consists of a new showerhead rated at 2.0 gallons per minute (gpm) at 80 pounds per square inch (psi) and a swivel aerator for the kitchen faucet and fixed aerators for the lavatory faucets. The current US standard for showerheads is 2.5 gpm. Measurements of the existing shower flows in building stock show a range of 2.75 gpm to 3.75 gpm with frequent individual cases in excess of 5 gpm. Evaluations have shown that programs that replace with 2.0 gpm heads have greater savings than programs that replace with the standard 2.5 gpm shower heads. Program shower heads should be 2.0 gpm at 80 psi and with a lifetime scaling and clogging warranty. It is important also to be cautious about the use of "pressure compensating" showerheads. These are more prone to clogging and can lead to unintentional increases in flow rate in low pressure situations such as well water systems or older systems with occluded piping. Customer acceptability is an important component in a showerhead program. Customers will remove new low flow showerheads if the quality of the showering experience declines with the new showerhead. Therefore it is important to research and test the showerhead chosen for the program carefully. In addition, the old showerhead must be removed from the premises to decrease the likelihood of having it reinstalled.

Measure Applicability

This measure is applicable to the 40 percent of the residential sector that heat water with electricity.

Incremental Cost

Low flow fixture costs vary widely, and depend on whether the fixtures are purchased retail or in bulk. The costs for a bulk purchase for a showerhead and three aerators also have a wide range, about $8.00-$15.00/set. The most important feature of these fixtures is the long-term acceptability and durability because these factors have a direct impact on the lifetime savings. With a long enough lifetime, this is such a cost effective measure that all prices in the range are quite cost effective. Because the cost of the showerhead varies significantly and quality is so important for this program, it is essential to test, choose and pay the price for a high quality showerhead. This measure is so cost effective that even with a more expensive showerhead the program will still remain cost effective and a quality showerhead will ensure measure persistence. The per-unit-installed cost will be taken as $25/residence.[19]

Average Annual Expected Savings

Field monitoring studies can demonstrate the flow savings, but ultimately the overall savings will be a combination of flow savings and the duration of use. The flow of the showerhead used has a significant impact on savings. This program is designed around a 2.0 gpm showerhead as compared to a 2.5 gpm showerhead. Therefore the savings will be more than the 120–133 kWh per unit listed in DEER. In addition the climate is different and the inlet water temperature is lower so the savings in this I&M program will be greater. Several studies have measured final savings in terms of electric input to the tank, but usually these studies have included savings from comprehensive treatments including other measures such as tank and pipe insulation, kitchen and bath lavatory aerators, tank thermostat set back, and leaky diverter replacement. Savings can vary from program to program depending strongly on the choice of showerhead. Savings can also diminish with "take back" in the event that the new showering experience

---

[19] The DEER Database lists measure costs as $22.946 per unit and $37.946 installed cost

is longer than the original. Actual savings observed in the comprehensive cases include these take back effects, and are in the range of 650 kWh/yr to 950 kWh/yr. The savings from a showerhead and aerator change alone are taken as 500 kWh/yr.

Tank Wrap, Pipe Wrap, and Water Temperature Setpoint (R-13)

This technology consists of adding insulation around the water heater, checking and resetting the tank thermostat, and replacing leaky shower flow diverters. These measures are principally tank-centric, and can be self installed or by a site visit if the package is part of a broader program. Resetting the tank thermostat is also a safety issue because it can reduce scalding and burns due to too high a set temperature.

Measure Applicability

The applicability for measures of this type is discussed under low flow fixtures. In I&M service territory electric water heat accounts for about 40 percent of water heating, 2/3 of that 40 percent would be eligible for this measure because in some cases the tank cannot be accessed to install a blanket or one has already been installed. As a result the applicability is taken as 25 percent.

Incremental Cost

The cost of this treatment breaks down as $30 for materials and $20 for installation labor. For these purposes the measure cost is taken as $50 because these measures will typically be part of a larger program.

Average Annual Expected Savings

The dwelling savings for these measures is discussed under low flow fixtures. Based on prior experience and evaluation work on other programs it is estimated that the savings would be about 1 kWh per day.[20] For this program we have used the conservative value of 200 kWh/yr savings.

Expected Useful Life

The lifetime of these measures is potentially quite long. For practical purposes the lifetime will be considered limited by the expected lifetime of the hot water tank, 10 years.[21]

Expected Useful Life

The life time of this equipment is the key to its cost effectiveness. If an adequate, even pleasant, shower can be provided through lifetime warranted equipment, then the practical lifetime of the equipment is the length of time until the equipment is replaced in the course of renovation. For these purposes that lifetime is taken as 10 years.[22] Normally showerheads will last longer but with renovations and changes in ownership a 10 year EUL is a good planning number.

---

[20] Khawaja S. PhD, and Reichmuth, H. PE., 1997. Impact Evaluation of PacifiCorp's Ebcons Multifamily Program. Pacificorp.

[21] DEER says 15 years for pipe insulation, 9 years for faucet aerators, and 15 years for an efficient water heater so 10 years is conservative. The C&RD lists 10 years for a water heater with a minimum warranty of 10 years.

[22] DEER Database, 2005

Heat Pump Water Heaters (R-14)

Water heating is one of the largest energy uses in the home. In the case of electrically heated water, the annual water heating energy is about 4800 kWh/yr. The heat pump water heater is essentially a small heat pump drawing heat from the air by cooling and de-humidifying it and injecting this heat into a storage tank. Physically, this measure consists of a small self contained heat pump and a water storage tank and associated pumps and controls.

Measure Applicability

This measure is applicable to the 40 percent of the residential sector with electric water heat. Of these, 50 percent are assumed to have a suitable location for the unit. Overall measure applicability is assumed to be 20 percent of the residential sector.

Incremental Cost

The incremental cost of this measure consists of the cost of the heat pump water heater, water storage tank and installation plumbing and general construction labor. The site orientation of such a unit is important; it should never be sited in an attic and freezing situations should also be avoided. Therefore, some special site adaptation and plumbing may be necessary. For this study we will take $2,500 as the cost; others report lower costs but we do not think these take adequate account of special site costs.

Average Annual Expected Savings

For this study it is assumed that the heat pump water heater will perform with a coefficient of performance of 2, leading to annual savings of 2,000 kWh/yr.

Expected Useful Life

The useful life of this measure is assumed to be that of a similar appliance, a window air conditioner: 18 years.

Ductless Heat Pump (R-15)

This measure applies to residential electrically heated homes. Ductless heat pumps have two parts, an indoor and an outdoor unit. The outdoor unit can connect to multiple indoor units via a cable and refrigerant lines. The outdoor unit is placed outside at ground level and is connected to the indoor units via a small hole. The indoor units are wall mounted in centrally located rooms within the home and distribute the heated or cooled air throughout the space. Because of its design no ducts are required which eliminates fan energy and heat and cooling losses through the duct work.

Measure Applicability

This measure is applicable to most of the residential stock that uses electric resistance heat.

Incremental Cost

Incremental cost is expected to decline as the market becomes more familiar with this space heating technology.

Average Annual Expected Savings

Savings from installing a ductless heat pump depend on home size, usage, thermal integrity of the home, and temperature set point.

Expected Useful Life

Heat pump technology has been available for some time and its operating characteristics are well understood. The ductless heat pump is a new application of a tried and true technology; as a result the measure life of a heat pump is applied to the ductless heat pump in all applications.

Customer Reports (R-16)

Customer Reports is a behavioral measure. It saves energy by focusing customer attention on comparison to one's neighbor as a benchmark. In a generic approach to customer reports, participant households receive periodic reports illustrating their energy use performance in comparison to neighbors in similar homes.

Measure Applicability

All residential customers are technically eligible, however marking and promotion will be to random selected customers in the upper half of the yearly energy usage distribution.

Incremental Cost

The incremental cost is quite low since the form of the measure is simply a report received quarterly or with some other chosen frequency.

Average Annual Expected Savings

Some customer reports programs include resultant energy savings from change in energy use behaviors (reducing waste while preserving amenity), appliance purchases and recruitment into traditional energy efficiency programs as a result of the customer reports. For this measure/program we include only behavioral savings. The initial savings assumption used in program planning (as a one-year percentage of annual kWh usage) has been reported by prior programs. However, for treatments that continue over multiple years the decay of attention should be considered. We have assumed long range annual savings in the order of two-thirds of what might be expected in the first year of treatment.

Expected Useful Life

Until there is at least a decade of experience with scaled up customer reports programs and studies of decay following the last report received, the measure life is taken as one year. However, for a program of duration of more than one year the calculation assumes a decay effect after one year and that amount of savings is assumed to be stable for each year customer reports are received.

Smart Plug (RC-1)

This measure consists of a power strip with load sensing capability. When the primary load is turned off, the secondary loads connected to the power strip are automatically powered down. This measure is typically used in home office spaces where support equipment (printers, projectors, etc.) may be left on after the connected computer is turned off.

Measure Applicability

This measure is applicable to residential home office space and some entertainment center applications.

Incremental Cost

The incremental cost for this measure is determined to be the cost of purchase of the smart plug.

Average Annual Expected Savings

Savings associated with this measure are based on home-energy use surveys, with typical household electronics usages and reasonable assumptions of secondary equipment usage patterns. It should be noted that the household loading due to electronics is increasing steadily and projected savings from this measure will likely increase over time.

Expected Useful Life

This measure will have a medium-term useful life.

Commercial Measures

Combined Heat and Power (C-1)

This measure is a form of site generation with the waste heat applied to large steady thermal loads, usually at an industrial scale. The economics favorable to this measure usually involve a high thermal load factor. Electricity generated by CHP applied to an existing gas thermal load has a unique efficiency opportunity in terms of fuel use and in terms of carbon offset because the fuel use associated with the generated electricity is only the marginal increase in gas use. The CHP resource is strongly favored from the perspective of carbon calculations. System sizes range from about 100 kW to MW scale in electrical output.

Measure Applicability

This measure is applicable in a large scale industrial context.

Incremental Cost

This cost for measure is very site specific, of the order of $500-$1500/kW electric. This measure also has significant annual maintenance costs.

Average Annual Expected Savings

The savings from this measure consist of the net electrical output of the CHP plant. For example, a single moderately-sized plant of 250 kW would have an output of the order of 2 million kWh/yr.

Expected Useful Life

This measure has an expected useful life typical of appliances, of 15 to 20 years.

Small HVAC Optimization and Repair (C-2)

This measure applies to packaged rooftop units. These units are the predominant means of conditioning for small-to-medium scale commercial buildings. The savings proceed from improved compressor performance, better run time control, and fresh air cooling. These rooftop units are a homogenous pool of equipment that has been identified as underperforming. Typically, the refrigerant charge is out of specification, the economizers perform poorly if at all, and the airflow is too low for proper operation. Many utilities (e.g., SCE, PG&E, National Grid) are offering programs employing a structured diagnosis and repair protocol. Often these programs use trade named processes such as Proctor Engineering "check me", or PECI "aircare plus" etc. Candidates for this measure are rooftop units found in a wide range of sizes with output capacities of from 4 to 50 tons with the most predominant capacity being 5 tons.

Measure Applicability

This measure is applicable in 70 percent of the commercial sector.

Incremental Cost

The cost for this technology includes site visits and diagnostics with simple repairs performed immediately without need for a second site visit. The costs will naturally vary with the specifics of the repair. Planning estimates for this diverse mix of treatments, made by the Northwest Power and Conservation Council (NWPCC), use $0.20/first year kWh savings.

Average Annual Expected Savings

Savings vary from unit to unit, but in the cases where there have been significant corrections to the refrigerant charge or to economizer operation savings on the order of 2,500 kWh/unit have been observed. At a particular site there will typically be several treated units.

Expected Useful Life

There are inherent limitations to the lifetime of the treatment provided by this measure. The improvements may be superseded by operational changes, and the remaining lifetime of the treated unit may be limited.

Retro Commissioning Engagement (C-3)

Commissioning is a systematic step-by-step process of identifying and correcting problems and ensuring system functionality. Commissioning seeks first to verify that the system design intent is properly executed, and it goes further by comparing actual building energy performance to appropriate bench marks to validate building performance as a whole. The best candidates for this measure are buildings larger than about 100,000 square feet. While commissioning in general can become quite complex, often the greatest savings proceed from a simple review of building operations to assure that the building is not being unnecessarily used during non-occupied times. New Commissioning (C-3) should be done as part of the construction contract, and most contractors will claim that this is normal business. But the performance of even new buildings is often erratic for a year or two while unnoticed problems come to light. This new commissioning is a detailed process of initial calibration and control sequence testing or verification. The initial process is usually not done well, but even so, the initial commissioning is inherently limited because usually it takes about a year of building operation to see how the building actually operates as a whole. By contrast, Retro-Commissioning (C-4) seeks to tune a building that is already operating and has a track record of a year or two at least. The Retro-Commissioning process starts with an analysis of the utility bills for all fuels, which to a trained eye will show the larger general operational problems which are then followed up with a limited scope site visit. Retro-Commissioning is usually necessary even for buildings that have been initially commissioned. There will be the occasional building which after years of operation will have its controls so mixed up that it will need a comprehensive new commissioning (C-3). In practice the New Commissioning is the larger more complicated job, while Retro-Commissioning is more superficial and focused on finding and fixing major problems only by applying low-cost/no-cost controls changes.

Measure Applicability

In this analysis New Commissioning is assumed to take place on 100 percent of new commercial stock as a matter of proper business. Retro-Commissioning is applicable in 75 percent of the existing commercial sector, and after a few years, to all of the new commercial buildings.

Incremental Cost

The cost for this technology is quite site specific, based on NWPCC estimates new commissioning costs about $0.37/kWh/yr, which for a typical large commercial building of 100,000 square feet would be about $37,000. For this study we are assuming a brief version of retrofit commissioning. Retro-Commissioning, or "commissioning lite", that prescreens buildings on the basis of billing data and follows it with a site visit. In this analysis, all program-related commissioning is the Retro Commissioning and the New Commissioning is assumed to be part of the construction process.

Average Annual Expected Savings

Savings from this measure can vary widely. For Retro Commissioning, it is assumed here that the building electric energy use can be reduced by on average 20 percent. A significant portion of the energy savings due to both of these measures is associated with the heating fuel, usually gas. In estimates of program cost effectiveness for electric utilities, gas savings are usually not valued which can underrate the overall cost effectiveness of this measure.

Expected Useful Life

There are inherent limitations to the lifetime of the treatment provided by this measure. The improvements may be superseded by operational changes, and the remaining lifetime of the treated unit may be limited.

Low-E Windows (C-4)

This measure saves energy by reducing the thermal losses and gains through windows. This measure assumes that the efficient window has a heat loss rate of 0.35 BTU/deg F hr, representing the performance of a quality, double glazed argon filled low-e window. The original window is assumed to have a heat loss rate of 0.75 BTU/deg F hr, representing the average losses from a mix of single and double glazed windows.

Measure Applicability

This measure is applicable in 100 percent of new commercial buildings and 30 percent of existing commercial stock.

Incremental Cost

The incremental cost for this technology depends strongly on the context of use. If the efficient windows are used in a replacement context, then the full cost of $20/sqft is applicable. If the efficient windows are used as an upgrade in new construction then an incremental cost of only $3/sqft is used.

Average Annual Expected Savings

It is assumed here that the average site installation will contain 1,500 square feet of high efficiency window replacements.

Expected Useful Life

This is a very long-lived measure that will generally last the life of the building. For the purpose of this study, a periodic change-out due to breakage and the potential for future technological innovations leading to window replacement were assumed.

Premium New HVAC Equipment (C-5)

Premium new HVAC equipment employs more efficient motors/pumps and larger heat exchangers and pipes to lower operating energy requirements. Premium equipment is often designated with an Energy Star rating or by the Consortium of Energy Efficiency (CEE) as Tier I or Tier II, or it may not have an official rating, but it does deliver slightly improved performance and is usually sold as such. Premium HVAC equipment is a very broad category including efficient variable speed fans, and efficient chillers, efficient ice makers, and efficient packaged roof top units. It should be noted that rooftop units serve more than half of the commercial space, and they have therefore been the subject of an ongoing efficiency improvement campaign by CEE and the industry.

Measure Applicability

This measure is applicable in 100 percent of new commercial construction.

Incremental Cost

The incremental cost for this technology will be very diverse and quite site specific. Based on NWPCC estimates, the premium upgrade costs about $0.46/kWh/yr.

Average Annual Expected Savings

Savings attributable to this measure are generally fairly small because they represent only an incremental improvement in performance on equipment that is already required to be reasonably efficient. It is assumed here that the savings in new construction will be 3 percent of total energy use.

Expected Useful Life

The premium upgrades can be expected to last the life of the equipment.

Large HVAC Optimization and Repair (C-6)

This measure refers to restoring large HVAC equipment to its nominal operating performance. This measure needs to be distinguished from commissioning which is used to refine the controls of large HVAC which generally leads to large savings. By contrast this measure applies to the operation of the equipment and includes chiller and condensing tower cleaning, filter maintenance and tune-up etc. It also includes the optimization of economizer operation by verifying that the enthalpy sensors and economizer controls are functioning properly.

Measure Applicability

This measure is applicable in commercial sector buildings with large HVAC systems.

Incremental Cost

The incremental cost for this technology will be very diverse and quite site specific. Based on NWPCC estimates, the premium upgrade costs about $0.34/kWh/yr.

Average Annual Expected Savings

Savings attributable to this measure are generally fairly small because they claim only the savings due to restoring equipment to its original operation. For this study these savings are assumed to be 3 percent of building energy use.

Expected Useful Life

There are inherent limitations to the lifetime of the treatment provided by this measure. The improvements may be superseded by operational changes, and the remaining lifetime of the treated unit may be limited.

Window Film (C-7)

Window films are thin layers of polyester, metallic and adhesive coatings that allow some light to pass through but greatly reduce the amount of solar radiation passing through the window. These films provide some barrier to heat loss through the window. It is a highly cost-effective measure with wide application.

Measure Applicability

This measure is applicable in 90% of the commercial sector. While all buildings would benefit from the installation of this measure, buildings with 25% or greater of total outside wall area containing windows, single pane windows and south/south-west facing windows will receive greater benefit from this measure.

Incremental Cost

Energy Star lists the incremental cost of window film ranging from $1.35 to $3.00 per square foot of film.

Average Annual Expected Savings

During the cooling season 60% of a building's heat load is generated by solar heating though windows. During the heating season, up to 25% of a buildings heat loss is through window conduction. Window films greatly reduce these energy loads. For typical building installation, annual energy savings are assumed to be 4 kWh/yr per square foot installed.

Expected Useful Life

This measure is assumed to have a relatively short useful life.

Integrated Building Design (C-8)

This measure applies to new construction where careful design and specific engineering can get beyond the rules of thumb, leading to the use of smaller equipment more carefully matched to load. Integrated design refers to an approach commonly used to design energy efficient new commercial buildings. Essentially, the design process lowers building loads, and then carefully matches HVAC equipment to the lowered load. In practice the most significant characteristic of efficient new commercial buildings is significantly reduced lighting loads and often reduced plug loads. The other important characteristic is enhanced building shell performance through improved insulation and solar shading, and enhanced daylighting. Taken together these improvements result in significantly altered lighting, heating, and cooling loads. Typically, the cooling loads will be significantly reduced, while the changes to the heating loads are more complex. The reduced internal gain from lighting etc will actually increase the gross heating loads, which the shell improvements may reduce somewhat through insulation or emphasized solar gain.

The altered heating and cooling loads will usually not conform to established equipment sizing rules of thumb, which generally result in oversized equipment. A primary objective in integrated design is to down size or eliminate the HVAC equipment leading to more efficient operation, and often leading to installation cost savings. It is notable that the shell improvements will usually result in more stable and comfortable interior wall and glazing surface temperatures that permit alternative and reduced means of heating and cooling distribution which can lead in turn to reduced fan or pump energy, leading to significantly more efficient heating and cooling distribution strategies. This reduction in distribution can also result in reduced installation costs. The integrated design process usually employs building modeling, but as more efficient new commercial building experience develops, a few basic strategies are emerging which can be used without recourse to costly building modeling. (see: New Buildings Institute, Core Performance Guide).

Measure Applicability

This measure is applicable in 100 percent of new commercial construction, but in national chain or franchise designs, the integrated design may already have been done at the corporate level, or getting to a level of integrated design may require interaction at the corporate design level that may not be possible at the local level.

Incremental Cost

The incremental cost for this technology will be very diverse and quite site specific. The incremental costs of efficient new commercial buildings developed through integrated design are quite building specific, and may range widely from about $3.50/square foot to negative incremental cost. But in general, the incremental cost will be the net of some increased costs for various building elements (such as lighting, external shading elements, insulation, more efficient equipment, more sophisticated controls, etc), and some decreased costs resulting from reduced equipment sizes and simplified distribution strategies. There are examples of highly efficient new commercial buildings that have negative incremental costs, but a good rule of thumb is to assume that the incremental cost will be of the order of $1.75/square foot, or about $0.35/first year kWh saved.

The particular incremental cost for a real building could be quite complex to estimate. Therefore in order to minimize overhead, utility programs that provide incentives for integrated design will base the incentives on modeled and deemed per square foot estimates of energy savings for principal occupancy types (retail, schools, offices, etc) for various HVAC systems and measure packages.

Average Annual Expected Savings

The savings due to integrated design will include the savings due to efficient lighting, efficient HVAC equipment, and controls. Taken as a package these savings can easily be on the order of 20-40 percent of the standard code compliant design. The current US tax code allows preferred treatment for new buildings that are 50 percent better than code or lighting systems that are 30 percent better than code.

Expected Useful Life

Integrated design can be expected to last the life of the building.

Efficient Package Refrigeration (C-9)

This measure consists of an efficient packaged and optimized new refrigeration system.

Measure Applicability

This measure is applicable in portions of the grocery sector and in some restaurants.

Incremental Cost

The incremental cost for this technology will be very diverse and quite site specific. Based on NWPCC estimates, the efficient packaged refrigeration costs about $0.15/kWh/yr.

Average Annual Expected Savings

It is assumed here that this measure can reduce a building energy use in applicable sites by 10 percent.

Expected Useful Life

Efficient package refrigeration will be considered operational 8760 hours per year with standard refrigerator operation life.

Electronically Commutated Motors (C-10)

An electronically commutated motor is a more efficient motor with variable speed control capability. In fan and pump applications it can save energy by operating at a more efficient speed. Refrigeration applications involving case cooling distribution fans are especially favored because the power reduction leads to a lower refrigeration load.

Measure Applicability

This measure is broadly applicable throughout the commercial sector.

Incremental Cost

The incremental cost for this technology will be very diverse and quite site specific. Based on NWPCC estimates, the premium upgrade costs about $0.33/kWh/yr.

Average Annual Expected Savings

It is assumed here that this measure can reduce a building energy use by 4 percent.

Expected Useful Life

Highly dependent on operational hours, electronically commutated motors are assumed to have a standard motor useful life.

Premium Motors (C-11)

This measure saves energy by reducing energy losses in motors. Motor energy use is preponderant in manufacturing applications where of the order of 40-60 percent of electric energy is used in motors, and these motor applications are frequently full-time operation or near full-time operation.

Motor efficiency varies with the size of the motor as is illustrated in the figure below.
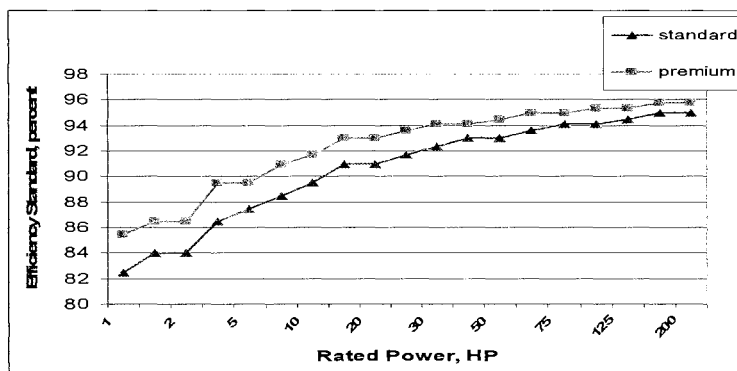
The figure above shows the efficiency improvement to be gained by using the more efficient motor. While the efficiency gain is only about 2 percent for the smaller motors, it is important because the duty cycle of many motor applications is of the order of 5,000-8,760 hours/year.

In constant speed motor applications, an even greater electric energy savings may be available by properly matching the motor to its load. In particular, the efficiency of smaller motors in the 1-10 horsepower range can vary greatly with the duty load on the motor as illustrated in Figure 3. In this figure it is evident that if a smaller motor is oversized relative to its load, the efficiency can be reduced by of the order of 10 percent.

In motor replacement (and new motor) specifications, it is especially important to consider the fit of the motor to its load in terms of motor horsepower, speed, and starting torque. The greater portion of savings often rests with the proper match of the motor to its load.

A simple one-for-one motor replacement can have unexpected results. An important element in the use of higher efficiency motors is that the equilibrium speed of the higher efficiency motor is often slightly higher than the speed of the lower efficiency motor that was replaced. In fan and pump systems this slight increase in speed will increase the fluid throughput and power. So although a more efficient motor has been used, it may actually lead to an unintended but slight increase in flow and power unless the drive system is adjusted to compensate.
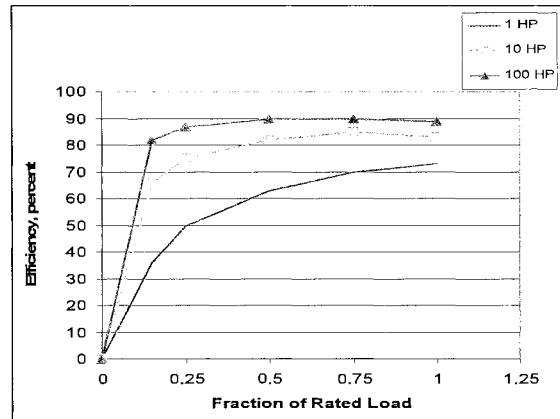
Measure Applicability

This measure is applicable in the new commercial and manufacturing sectors, and in suitable retrofit situations.

Incremental Cost

The incremental cost for this technology will be very diverse, and dependent on the size of the motor.

Average Annual Expected Savings

The savings from an efficient motor must assume that the drive has been adjusted as necessary to give equivalent flow or drive effort, and the savings will then depend strongly on the duty cycle hours/yr.

Expected Useful Life

This measure is essentially a built-in measure and is assumed to have a standard motor useful life.

Variable Speed Drives, Controls, and Motor Applications Tune-Up (C-12, C-13)

This measure saves energy by providing an efficient way to match a motor to a varying load. Motor controls, commonly referred to as variable speed or variable frequency drives, alter the frequency applied to the motor and thereby permit the motor to run more efficiently at lower outputs. This control capability is particularly important in process applications where a pump or fan is being controlled to maintain a particular and often varying fluid flow. Often the fluid flow is controlled by means of dampers or throttling valves that force the fan or pump motor to operate inefficiently. The savings associated with the proper speed control are most pronounced when the motor is operating at less than its rated capacity. At full capacity there may be little savings.

Situations involving fans, air compressors or pumps, (which is the most common commercial/industrial application of motors), have a very high energy sensitivity to flow rate; typically the energy varies as the cube of the flow rate. Attention to how the flow is controlled with the use of variable speed controls and elimination of excess flow can often lead to power reductions of the order of 50 percent with only minor reductions in flow. In this manner, variable speed motor control permits finer tuning and control of pumps, fans, compressors, and conveyers.

This is a very broad measure and the cost and savings are based on a complex fully-controlled application, here referred to as C14a. There is also a broad niche for single independent applications of these controls in matching a fan or pump to a fixed load that are much lower cost than a fully controlled application, but can still result in significant savings. This simpler application is here referred to as C-14b.

There is another genre of motors and controls referred to as brushless permanent magnet torque motors. These are very high torque motors that require minimal drive gearing and can be very precisely controlled. These have very good positioning capabilities and are used in machining and manufacturing assembly operations.

Measure Applicability

This measure is applicable in the new commercial and manufacturing sectors, and in suitable retrofit situations.

Incremental Cost

The incremental cost for this technology will be very diverse. Based on NWPPC estimates, an aggregated estimate of the costs of adjustable speed drives is about $0.86/kWh/yr.

Average Annual Expected Savings

It is assumed here that an application of drive control can save about 20 percent of the total building energy.

Expected Useful Life

This measure is essentially a built-in measure and is assumed to have a standard useful life.

Energy Star Transformers (C-14)

This measure saves energy by reducing energy losses associated with stepping down from high service voltages to typical service application voltages. In larger buildings and plants it is often more economic to distribute the power at high voltages to various floors and major areas where it is then stepped down to its ultimate application voltage through a transformer. These transformers are typically efficient (>95%) when they are properly loaded, but an oversized or under loaded transformer can operate at a much lower efficiency; therefore, it is important that the transformers be sized properly. However, even when the transformer is properly sized, it is important to use the most efficient transformer because all power passes through it.

Transformer efficiency varies with the size of the transformer as illustrated in the figure below.
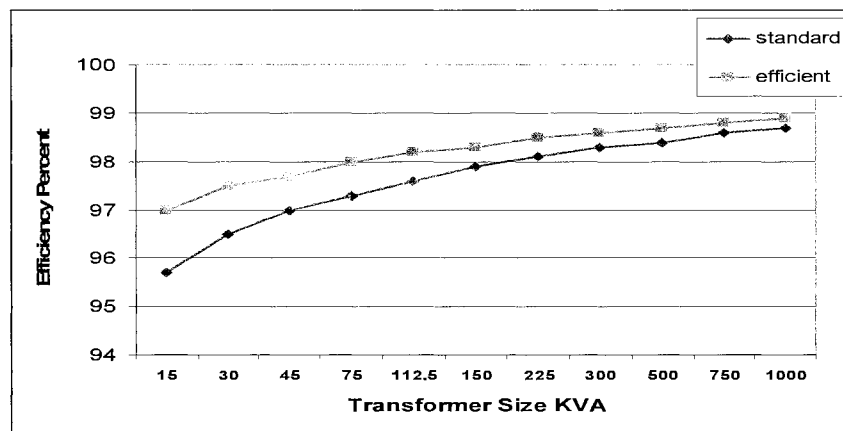
Figure 4. Transformer Efficiency Standard vs Efficient

Figure 4 shows the efficiency improvement to be gained by using the more efficient Energy Star labeled transformer. While the efficiency gain is only about 1 percent for the smaller transformers it is important because all power runs through it and the percentage savings will be taken off the top.

Measure Applicability

This measure is applicable in the new commercial and manufacturing sectors, and in suitable retrofit situations.

Incremental Cost

The incremental cost for this technology will vary with the size of the transformer. For this study, we take a 150 KVA transformer as the average.

Average Annual Expected Savings

Transformer savings are based on the size of the transformer, and are based on the power throughput of the transformer as well as standby losses, 8760 hours/year.

Expected Useful Life

This measure is essentially a built-in measure and is assumed to have a standard useful life.

Efficient AC/DC Power (C-15)

A modern office environment has a multitude of electronic appliances, most of which are powered by a small transformer AC/DC converter. Standard transformer based converters are about 30-40 percent efficient. More efficient designs called switching power supplies operate with an efficiency of about 90 percent. The energy savings for this measure proceed from switching to the more efficient power supplies.

Measure Applicability

This measure is applicable in 100 percent of the commercial sector.

Incremental Cost

The incremental cost for this technology will be very diverse. Based on NWPCC estimates, the premium upgrade costs about $0.074/kWh/yr.

Average Annual Expected Savings

Electronics and computers use 12 percent of commercial energy on a US average basis. This equipment is often on 24 hours a day. It is assumed here that doubling the power supply efficiency from 45 to 90 percent would save at least 1.5 percent of the total building energy.

Expected Useful Life

This measure is assumed to have high usage which results in a relatively short useful life.

LED Outdoor Lighting (C-16)

LED lighting applications use much less energy than incandescent or metal halide lighting applications. At the present the color of "white" LED light is somewhat blue tinted and not always suitable for general interior applications. But this color is often suitable for outdoor applications and it is probable that LED lighting will find its place in many outdoor applications. The application considered here is an LED outdoor light, often referred to as a "cobra light", which is used to illuminate parking lots and outdoor areas.

Measure Applicability

This measure is still evolving but will likely be applicable to a large percentage of the commercial sector.

Incremental Cost

A significant and favorable cost impact for this measure is its long life, leading to maintenance savings in cases where the light is difficult to access. Incremental costs vary based on lighting intensity and usage requirements.

Average Annual Expected Savings

Measure savings proceed from the replacement of a 250 watt light by a 19 watt LED assembly.

Expected Useful Life

The expected useful life for this long-lived measure is highly dependent on replacement bulb quality and usage, with varied results between 10-30 years.

New and Retrofit Efficient Lighting Equipment (C-17, C-18)

Lighting efficiency is the major commercial efficiency measure. Lighting accounts for 35 percent of commercial energy, and lighting also accounts for significant cooling energy that is saved when lighting is more efficient. There are literally hundreds of combinations of more efficient lighting elements that can replace less efficient elements. The most prevalent lighting efficiencies are CFL replacement for incandescent, LED replacement for incandescent and for task lighting, and high efficiency fluorescent T5 replacements for high bay lighting and linear fluorescent lighting. This efficient lighting measure goes beyond the light sources only and includes daylighting controls, bi-level switching and occupancy sensors. Recent improvements in daylighting and lighting controls have been dramatic. Taken together it is common to find efficient lighting that can reduce lighting energy by 50 percent from the minimum code required levels.

Measure Applicability

This measure is applicable in 100 percent of the new commercial buildings and in 85 percent of the existing commercial sector.

Incremental Cost

The incremental cost for this technology is essentially the cost of the efficient lighting components. These costs will be very diverse and site specific. Based on NWPCC estimates, and averaging the full range of conditions, efficient lighting costs about $0.26/kWh/yr. For a retrofit application, the cost is increased by 25 percent to allow for installation constraints.

Average Annual Expected Savings

A comprehensive lighting retrofit or new building lighting can save about 25 percent of the 34 percent lighting end-use, in all 8 percent of building energy.

Expected Useful Life

The useful life of the wide variety of lighting equipment varies widely from one light source or ballast to another. However, these elements are the replaceable elements within an overall installed system that determines overall useful lifetime.

LED Exit Signs (C-19)

Typical existing exit signs are incandescent exit signs. This measure is designed to replace these typical exit signs with an Energy Star Light Emitting Diode (LED) Exit Sign which is more efficient than the incandescent versions.

Measure Applicability

In principal, this measure is applicable in the entire commercial sector, and there are no physical constraints to replacing existing exit signs, but to account for already installed LED exit signs the applicability is assumed to be 85 percent of the commercial sector.

Incremental Cost

The incremental cost of an Energy Star LED Exit Sign over an incandescent exit sign is in the order of $50.

Average Annual Expected Savings

The average annual expected saving for this replacement is 245 kWh/year.[23] In the average building considered in this analysis, there are assumed to be 6 exit signs.

Expected Useful Life

LED exit signs are very long-lived light sources.

---

[23] C&RD Database

LED Traffic Lights (C-20)

LED traffic lights[24] save energy because LED light sources are a much more efficient and long-lived light source than the incandescent bulbs they replace. They save energy but they also save in terms of bulb replacement costs. LED traffic lights have a variety of configurations. Each color (red, green, or yellow), each size (8 inch or 12 inch) and each type (thru lane, left turn bay, right turn bay, and don't walk large or small) has different incremental cost, savings and effective useful life values.

Measure Applicability

Measure applicability was not estimated due to lack of data on traffic lights in the DEO service territory. But for this analysis, it is assumed that there are 0.3 retrofittable intersections for every commercial building.

Incremental Cost

Depending on the color, size and type, the incremental cost ranges from $110 to $225. For this analysis we consider LED traffic light replacements in groups of 10, approximately the number of lamp replacements necessary to refit an intersection. For this analysis we will assume the average replaced light costs $200. These incremental costs do not assume an installation cost. It is assumed that the installation is done by the agency controlling the lights, and that it is more than paid for by the ongoing maintenance savings.

Average Annual Expected Savings

Depending on the color, size and type, the savings range from 111 to 808 kWh/year. For this analysis we consider LED traffic light replacements in groups of 10, approximately the number of lamp replacements necessary to refit an intersection. For this analysis we will assume the average replaced light saves 500 kWh/yr.

Expected Useful Life

Depending on the color, size and type, the expected useful life ranges from 3 to 16 years.

---

[24] All values for LED Traffic Lights are available in the C&RD Database.

Small Commercial LED Change-out (C-21)

The Small Commercial LED Change-out is a pilot measure to change from incandescent or halogen lamps to LEDs in restaurants and small/medium retail shops, typically mall shops or small street-front shops. LED prices continue to decline and with their long measure life will be cost-effective in many small commercial change-out applications. LED light sources are a much more efficient and long-lived light source than the incandescent or halogen bulbs they replace. They save energy but they also save in terms of bulb replacement costs.

Measure Applicability

Measure applicability will be determined through the pilot application. Care will need to be taken insure each project is individually cost-effective. This will depend primarily on equipment in place.

Incremental Cost

Depending on floor arrangement and types of display for on-floor merchandise, the type of LED will vary. Primarily, the LEDs installed will range from 10 to 16 Watts. Retail price per bulb is expected to range from $9 to $15, and price to the program is estimated at $6 to $15. Total assumed installation cost is $30 per bulb. The price will be the outcome of negotiation. It is expected that bulbs will be retrofit into existing sockets, and that likely fewer bulbs will be required than were originally in place.

Average Annual Expected Savings

Depending on the size, the savings range from 180 to 300 kWh/year per bulb. For this analysis we consider replacements in groups of 35, approximately the number of lamp replacements necessary to refit a small business in a typical mall shop. For this analysis we will assume the average replaced light saves 236 kWh/yr.

Expected Useful Life

The expected useful life is assumed to be 6 years with an average operation history of 4,000 hours per year.

Perimeter Daylighting (C-22)

This measure saves energy by reducing energy to lighting that is in or adjacent to day lit spaces. Some cooling energy savings are also possible because well controlled day lighting contributes less internal gain to a space. This measure controls lighting based on a well placed day light sensor. This measure also includes design and details to control glare or over lighting.

Measure Applicability

This measure is applicable in the new commercial sector, and in suitable retrofit situations.

Incremental Cost

The incremental cost for this technology will be very diverse. Based on NWPCC estimates, perimeter daylighting costs about $0.85/kWh/yr.

Average Annual Expected Savings

It is assumed here that a full application of perimeter daylighting can save about 3 percent of the total building energy.

Expected Useful Life

This measure is essentially a built-in measure and is assumed to have a standard useful life.

Low Flow Fixtures (C-23)

This technology consists of a new showerhead rated at 2.0 gpm at 80 psi (or 1.5 gpm @60 psi) and a swivel aerator for any kitchen faucets, and fixed aerators for the lavatory faucets. The current US standard for showerheads is 2.5 gpm. And measurements of the existing shower flows in building stock show a range of 2.75 to 3.75 gpm with frequent individual cases showing in excess of 5 gpm. Evaluations have shown that programs that replace with 2.0 gpm heads have greater savings than programs that replace with the standard 2.5 gpm shower heads. Program shower heads should be 2.0 gpm at 80 psi and with a lifetime scaling and clogging warranty. It is important also to be cautious about the use of "pressure compensating" showerheads. These are more prone to clogging, and can lead to unintentional increases in flow rate in low pressure situations such as well water systems or older systems with occluded piping. Customer acceptability is an important component in a showerhead program. Customers will remove new low flow showerheads if the quality of the showering experience declines with the new showerhead. Therefore it is important to research and test the showerhead chosen for the program carefully. In addition the old showerhead must be removed from the premises to decrease the likelihood of having it reinstalled.

Measure Applicability

This measure is applicable to circumstances where there is showering; such as, schools, hospitality, health clubs, etc. The best application will be a site where the water is heated electrically.

Incremental Cost

The incremental cost for this measure is taken as $1,000, reflecting the installation of 15-40 showerheads by appropriately licensed professionals. Because the cost of the showerhead varies significantly and quality is so important for this program, it is essential to test, choose, and pay for a high quality showerhead. This measure is so cost effective that even with a more expensive showerhead the program will still remain cost effective and a quality showerhead will ensure measure persistence.

Average Annual Expected Savings

The average annual savings for this measure are directly related to the daily number of showers taken. For this study the showering load is assumed similar to a residential one and the overall savings are taken as 6,000 kWh/yr, representing the savings from 15-40 showerheads. The flow of the showerhead used has a significant impact on savings. Programs should be designed around a 2.0 gpm showerhead as compared to a 2.5 gpm showerhead. Therefore the savings will be more than the 120–133 kWh per unit listed in DEER. In addition the climate is different and the inlet water temperature is lower so the savings in this DEO program will be greater. Several studies have measured final savings in terms of electric input to the tank, but usually these studies have included savings from comprehensive treatments including other measures including tank and pipe insulation, kitchen and bath lavatory aerators, tank thermostat set back, and leaky diverter replacement. Savings can vary from program to program depending strongly on the choice of showerhead. A significant but unquantified addition to savings is associated with the water and sewer savings.

Expected Useful Life

The lifetime of this equipment is the key to its cost effectiveness. If an adequate, even pleasant, shower can be provided through lifetime warranted equipment, then the practical lifetime of the equipment is the

length of time until the equipment is replaced in the course of renovation. DEER uses a lifetime of 10 years for this measure. Normally showerheads will last longer but with renovations and changes in ownership the average showerhead useful lifetime will be somewhat shortened.

Solar Water Heaters (C-24)

The water heating end-use in commercial buildings is a smaller end-use than in residences. In the DEO service area large commercial water heating will be done by gas and it will not be a very good candidate for this measure. But the smaller commercial water heating applications will be residential scale in usage and often these smaller applications will be electrically heated. These are the candidate applications for this measure. In the case of electrically heated water, the annual water heating energy is about 4,800 kWh/yr. Countless demonstration cases have shown that solar energy can supply all or a portion of this heating. The portion of the water heating load assumed by a solar water heater depends on the size of the solar water heater in relation to the size of the load. Field experience has shown that the best combination of system size to load favors the more moderately sized systems that can fully meet the summer water heat load, but that only meet about 40-50 percent of the non summer load. In physical terms, this is a system consisting of about 40-65 square feet of solar collector and an additional 80 gallon heated water storage tank and appropriate pumps and controls.

Measure Applicability

This measure is applicable to large commercial buildings with reasonably low hot water use, and the system is sized as if it were residential. This measure is taken as applicable to 25 percent of the commercial sector.

Incremental Cost

The installation of a solar water heating system involves a mix of building skills including plumbing, electrical, roofing and general carpentry. In the general market, a turn-key installation for one of these systems is in the range of $5,000-$7,000.

Average Annual Expected Savings

The savings from solar water heaters depend on site specifics, principally solar insulation, air temperature, incoming water temperature, and hot water usage rate. Considering these dependencies for the DEO service area, annual savings are determined for a system sized and designed to be within a cost effective range.

Expected Useful Life

Solar water heating systems are essentially plumbing fixtures that are certified products (Solar Rating & Certification Corporation - SRCC) and are often inspected by local building officials. A well designed system will have lifetime in excess of 25 years, even though the system will take some intermediate maintenance such as inspecting the pump and fluid level.

Heat Pump Water Heaters (C-25)

The water heating end-use in commercial buildings is a smaller end-use than in residences. In the DEO service area large commercial water heating will be done by gas, and it will not be a very good candidate for this measure. But the smaller commercial water heating applications will be residential scale in usage, and often these smaller applications will be electrically heated. These are the candidate applications for this measure. In the case of electrically heated water, the annual water heating energy is about 4,800 kWh/yr. The heat pump water heater is essentially a small heat pump drawing heat from the air by cooling and de-humidifying it and injecting this heat into a storage tank. Physically, this measure consists of a small, self-contained heat pump and a water storage tank and associated pumps and controls.

Measure Applicability

This measure is applicable to large commercial buildings with reasonably low hot water use, and the system is sized as if it were residential. This measure is taken as applicable 25 percent of the commercial sector.

Incremental Cost

The incremental cost of this measure consists of the cost of the heat pump water heater, water storage tank and installation plumbing and general construction labor. The siting of such a unit is important; it should never be sited in an attic, and freezing situations should also be avoided. Therefore, some special site adaptation and plumbing may be necessary.

Average Annual Expected Savings

For this study it is assumed that the heat pump water heater will perform with a coefficient of performance of 2.

Expected Useful Life

The useful life of this measure is assumed to be that of a similar appliance, a window air conditioner.

HE Food Prep and Holding (C-26)

This measure involves cooking and storage equipment that saves energy by keeping prepared food warm more efficiently, providing more efficient cooking methods and water conservation. The measures aggregated within this category are: convection ovens, combination ovens, steam cookers, efficient food holding cabinets and low-flow pre-wash sprayer nozzles.

Measure Applicability

This measure is applicable in portions of the restaurant, hospitality, and education sectors.

Incremental Cost

Incremental cost for this category of measures combines a weighted ratio of costs among the bundled measures. Individual measure costs range from $50 for a single spray nozzle with installation and $17,000 for a new combination oven.

Average Annual Expected Savings

It is assumed here that this bundle of measures will provide an average annual savings based on the individual penetration of each measure within the available population. Weighted averages were developed with the following assumptions:

Measure	Market Penetration
Spray Nozzles	35%
Convection Ovens	15%
Combination Ovens	7%
Steam Cooker	2%
Holding Cabinets	10%

Expected Useful Life

Measure life for this aggregate was based on a weighted average dependent on individual component potential market penetration rates.

Energy Star Clothes Washer (C-27)

Energy Star rated commercial clothes washers provide a marked savings increase over standard washers with higher volume wash loads and greater energy and water savings per cycle. Energy Star rates washers as Tier 1, Tier 2 and Tier 3 (MEF>1.80, 2.00, 2.20 respectively). For the purpose of this evaluation, Tier 1 washers were assumed to be the installed measure at all sites.

Measure Applicability

This measure is applicable in portions of the hospitality sector.

Incremental Cost

DEER lists the incremental cost of Tier 1 clothes washers as $347 per unit with an assumed installation cost of $116.

Average Annual Expected Savings

Savings are based on Tier 1 clothes washers with electric dryers. The average treated site is assumed to have 3 washers.

Expected Useful Life

This measure is assumed to have a standard useful life.

Restaurant and Grocery Audit (C-28)

This measure consists of an audit conducted by a restaurant and grocery energy professional to identify the potential for efficiency in a commercial kitchen and food storage facility. Savings proceed from small things such as leaky faucets and unnecessary equipment operation to larger things such as major process changes. Since kitchen equipment is energy intensive the audit includes identification of cost effective equipment changes.

Measure Applicability

This measure is applicable to grocery stores and related facilities and to commercial kitchens in the restaurant, hospitality, and education sectors.

Incremental Cost

The incremental cost for this measure is limited to the cost of the audit only. The cost of any major equipment changes is associated with other measures. The cost for the audit is assumed to be $.0738/kWh/yr.

Average Annual Expected Savings

It is assumed here this measure can reduce the energy use in an applicable facility by 8 percent for the average building considered in this analysis.

Expected Useful Life

This measure will have a relatively short life.

Grocery Refrigeration Tune-Up and Improvements (C-29)

This measure consists of cleaning heat exchangers and assuring proper airflow at the freezer cases and condenser coils. It also involves appropriate belt adjustment and refrigeration charge correction and the addition of a floating head pressure control if appropriate.

Measure Applicability

This measure is applicable in portions of the grocery sector and in some restaurants.

Incremental Cost

Based on NWPCC estimates, the grocery refrigeration tune-up costs about $0.19/kWh/yr.

Average Annual Expected Savings

It is assumed here that this measure will save 6 percent of site electrical usage for the average building considered here.

Expected Useful Life

This measure is assumed to have a short useful life.

Refrigeration Casework Improvements (C-30)

This measure refers to improvements to refrigeration casework that can lower the refrigeration load. These include high quality insulated glass doors on the refrigeration case or other transparent refrigeration case covers that limit mixing of the warmer store air with the refrigerated air.

Casework improvements also include attention to two refrigeration case auxiliaries that emit heat into the refrigerated space. The first is the anti-sweat heater made part of the clear refrigeration door to melt frost that could accumulate on the door and obscure the view of the contents. These heaters are commonly on all the time when they are only needed during high humidity episodes with humidity greater than 55 percent. The control improvement is to control the anti-sweat heaters with a humidistat thus allowing operation only to times when it is needed. While this control improvement will depend on the store humidity and the specific heater size, the savings for a typical refrigeration case are estimated here to be 400 kWh/yr.

The second heat emitting auxiliary is lighting and small fans used to distribute the cooled air inside the refrigerated case. These fans typically use a small inefficient motor coupled to an inefficient fan blade. In a typical medium-sized refrigeration case the existing fans may use about 70 watts, with the efficient fans using only about 20 watts, for a savings during 8,760 hours/yr of 50 watts or about 450 kWh/yr/case.

Measure Applicability

This measure is applicable in portions of the grocery sector and in some restaurants.

Incremental Cost

Based on NWPCC estimates, an average refrigeration case upgrade costs about $0.33/kWh/yr.

Average Annual Expected Savings

It is assumed here that this measure will save 5 percent at a suitable site.

Expected Useful Life

This measure is assumed to have a standard useful life.

VendingMiser® and Vending Machine Timer Control (C-31)

The VendingMiser® is a controller placed on vending machines which powers down the lighted vending machine face during low use times while maintaining product quality. It cycles the machine to maintain temperature and uses occupancy sensors to control the lighting on the vending machine.

Measure Applicability

This measure is assumed to be applicable in 25 percent of the commercial sector.

Incremental Cost

According to DEER, the incremental cost for a VendingMiser® unit is $179 and installation costs are expected to be $35.50 in labor for a total incremental cost of $215.

Average Annual Expected Savings

Measure savings range from 800 to 1,200 kWh/yr, depending on the vending machine. Large machines with an illuminated front save 1,200 kWh/yr; and small machines or machines without an illuminated front save 800 kWh/yr.

Expected Useful Life

The expected useful life for this measure is the useful life of the associated vending machine.

Smart Plug (RC-1)

This measure consists of a power strip with load sensing capability. When the primary load is turned off, the secondary loads connected to the power strip are automatically powered down. This measure is typically used in home office spaces where support equipment (printers, projectors, etc.) may be left on after the connected computer is turned off.

Measure Applicability

This measure is applicable to residential home office space and some entertainment center applications.

Incremental Cost

The incremental cost for this measure is determined to be the cost of purchase of the smart plug.

Average Annual Expected Savings

Savings associated with this measure are based on home-energy use surveys, with typical household electronics usages and reasonable assumptions of secondary equipment usage patterns. It should be noted that the household loading due to electronics is increasing steadily and projected savings from this measure will likely increase over time.

Expected Useful Life

This measure will have a medium-term useful life.

Exhibit NM-3

I&M DSM/EE Program Scorecard October 2015

INDIANA MICHIGAN POWER
A unit of American Electric Power

I&M
DSM/EE Program Scorecard
October 2015
Program Year 6: January 1, 2015 - December 31, 2015

Cause No. 43827 DSM 5
CAC Set 6, Q11

Program	Measures Implemented				Program Budget Expenditures				Gross Energy Impacts (kWh)				Gross Demand Impacts (kW)				Net kWh	Net kW
	Current Month	YTD	Planning Goal	% to Goal	Current Month Actuals	YTD	Budget	% to Goal	Current Month kWh Savings	YTD	Energy Savings Goal	% to Goal	Current Month kW Savings	YTD	Demand Savings Goal	% to Goal	NTG Ratio	YTD	YTD
C&I Programs																			
Prescriptive Rebates	9,598	32,601	0		$242,832	$1,357,928	$2,763,894	49%	2,753,899	11,672,369	35,000,000	33%	726	2,676	5,600	48%	0.81	9,454,619	2,168
Custom Program	1,454	7,666	0		$282,387	$1,429,265	$2,704,917	53%	3,212,930	9,306,059	24,000,000	39%	426	1,336	5,021	27%	0.99	9,212,998	1,323
Small Business Direct Install	432	3,616	0		$31,619	$352,188	$823,042	43%	140,586	1,271,102	4,430,770	29%	31	323	349	93%	1	1,271,102	323
EECO Commerical	18	18	27	67%	$7,940	$44,895	$107,393	42%	485,995	3,136,190	13,581,338	23%	99	637	2,810	23%	1	3,136,190	637
Subtotal	11,502	43,901			$564,778	$3,184,276	$6,399,246	50%	6,593,410	25,385,720	77,012,108	33%	1,283	4,972	13,780	36%		23,074,909	4,450
Residential Programs																			
EECO Residential					$87,039	$489,960	$1,177,207	42%	513,995	3,316,876	14,371,293	23%	103	662	3,044	22%	1	3,316,876	662
Appliance Recycling	427	3,061	3,350	91%	$58,459	$527,041	$648,693	81%	411,656	2,966,424	3,068,260	97%	49	351	361	97%	0.72	2,135,825	253
Online Check-up	646	7,729	11,423	68%	$53,211	$436,287	$676,785	64%	302,349	4,330,779	3,865,320	112%	33	476	483	99%	0.85	3,681,162	405
Schools Education	3,506	11,261	11,755	96%	$168,382	$609,954	$647,775	94%	1,480,198	4,754,282	4,962,843	96%	210	676	705	96%	0.997	4,740,019	674
Home Energy Reporting	168,156	168,156	145,000	116%	$81,757	$921,735	$1,181,647	78%	1,872,158	21,707,865	33,000,000	66%	369	2,923	3,762	78%	1	21,707,865	2,923
Peak Reduction	0	8,079	9,000	90%	$13,119	$576,122	$824,835	70%	0	31,496	112,014	28%	0	5,632	5,670	99%	1	31,496	5,632
L.I. Weatherization	0	105	5,117	2%	$19,554	$193,272	$1,205,905	16%	0	5,068	1,029,804	0%	0	0	109	0%	1	5,068	0
Weatherization	0	815	8,878	9%	$43,946	$222,885	$1,432,478	16%	0	39,189	1,276,803	3%	0	4	395	1%	0.72	28,216	3
New Construction	54	280	449	62%	$54,624	$303,254	$492,422	62%	85,950	459,839	731,022	63%	67	340	545	62%	0.8	367,871	272
E.E. Products	133	962	1,183	81%	$43,321	$241,295	$371,264	65%	71,827	430,256	1,294,877	33%	7	48	397	12%	0.52	223,733	25
Lighting	31,768	195,680	513,715	38%	$108,100	$524,398	$1,072,014	49%	902,007	5,610,078	14,770,000	38%	108	670	2,300	29%	0.5	2,805,039	335
Subtotal	204,690	396,128	709,870	56%	$731,512	$5,046,203	$9,731,025	52%	5,640,140	43,652,151	78,482,236	56%	946	11,782	17,771	66%		39,043,170	11,183
INDIRECT COSTS																			
Staff Dev. & Prof. Organizations					$12,053	$49,355	$65,000	76%											
Computer System Development					$13,801	$178,048	$200,000	89%											
Marketing & Cust. Awareness					$17,359	$132,586	$300,000	44%											
New Program Development					$0	$0	$50,000	0%											
Potential Studies					$0	$0	$65,000	0%											
Planning & Analytic Support					$8,034	$68,840	$100,000	69%											
Budgeting & Acct. Support					$8,767	$120,634	$125,000	97%											
Subtotal					$60,014	$549,463	$905,000	61%											
PORTFOLIO TOTALS																			
Total Residential	204,690	396,128	709,870	56%	$731,512	$5,046,203	$9,731,025	52%	5,640,140	43,652,151	78,482,236	56%	946	11,782	17,771	66%		39,043,170	4,450
Total C&I	11,502	43,901			$321,946	$1,826,348	$6,399,246	29%	6,593,410	25,385,720	77,012,108	33%	1,283	4,972	13,780	36%		23,074,909	11,183
Total Portfolio	204,690	396,128	709,870	56%	$1,356,304	$8,779,942	$17,035,271	52%	12,233,550	69,037,871	155,494,344	44%	2,229	16,754	31,551	53%		62,118,080	15,633
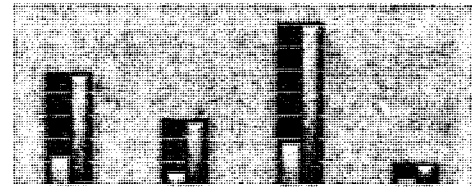
PROGRAM NOTES:

EECO	Participants = Number of Circuits with VVO equipment; Budget Expenditures are split 91.64% Residential, 8.36% Commercial
EECO	Revised Savings target based on number of Stations with Volt Var installed & operating.
Home Energy Reports	Program Savings are based on total # of active participants which is fluid based on opt outs & move outs / Updated Opower savings with final ytd totals received in August.
Peak Reduction	YTD participants includes all that have enrolled since 2012; minus opt outs, move outs, & removals.
Indirect Costs	$25,000 transferred from Planning & Analytical Support, $10,000 transferred from Market Potential Studies; to Staff Development & Memberships. ($35,000 total)
Total Portfolio	% to Goal for Measures doesn't include Commercial Measures

12/11/2015

Exhibit NM-4

I&M Discovery Request Response to CAC Set 4, Q1
I&M DSM/EE Program Scorecard EMV December

Program	End Note	Measures Implemented				Program Budget Expenditures				Gross Energy Impacts (kWh)				Gross Demand Impacts (kW)				NTG Ratio	Net kWh YTD	Net kW YTD
		Current Month	YTD	Planning Goal	% to Goal	Current Month Actuals	YTD	Budget	% to Goal	Current Month kWh Savings	YTD	Energy Savings Goal	% to Goal	Current Month kW Savings	YTD	Demand Savings Goal	% to Goal			
CORE PROGRAMS																				
Residential Home Energy Assessment		0	1,632	2,106	77%	$7,143	$756,980	$787,357	96%	0	2,181,517	2,182,000	100%	0	239	924	26%	87%	1,897,920	208
Residential Low Income Weatherization		0	1,104	1,425	77%	$5,155	$975,379	$1,113,647	88%	5,314	1,529,696	1,524,000	100%	0	139	661	21%	100%	1,529,696	139
Residential Lighting		0	407,950	358,069	114%	$6,822	$855,233	$910,819	94%	0	15,747,122	15,685,000	100%	0	1,874	3,787	49%	50%	7,873,561	937
Energy Efficient Schools - Kits		62	3,820	6,048	63%	$32,482	$567,661	$586,561	97%	28,179	1,736,190	1,858,000	93%	4	237	495	48%	97%	1,684,104	230
Energy Efficient Schools - Audits		0	12	12	100%				N/A	0	516,338	92,112	561%	0	33	1	3300%	377%	1,946,594	124
C&I Rebate Programs		0	36,691	114,821	32%	$1,658	$2,576,019	$3,111,298	83%	0	23,782,606	35,000,000	68%	0	3,684	5,645	65%	80%	19,026,085	2,947
Subtotal		62	451,209	482,481	94%	$53,260	$5,731,272	$6,509,682	88%	33,493	45,493,470	56,341,112	81%	4	6,206	11,513	54%		33,957,961	4,585
CORE PLUS PROGRAMS																				
Appliance Recycling Program	7	260	3,879	3,137	124%	$43,270	$676,921	$649,077	104%	271,892	4,029,025	3,181,339	127%	34	506	943	54%	68%	2,739,737	344
Online Energy Check-up Program	8	71	5,395	6,882	78%	$8,765	$306,314	$338,585	90%	38,930	2,818,382	3,750,932	75%	3	245	262	93%	85%	2,395,625	208
Home Energy Reporting Program	9	94,295	96,278	100,000	96%	$1,433	$721,384	$735,348	98%	2,429,547	23,776,713	28,256,000	84%	251	2,596	1,930	135%	100%	23,776,713	2,596
Peak Reduction	10	0	8,440	9,000	94%	$18,103	$1,147,690	$1,047,129	110%	0	62,367	0	#DIV/0!	0	5,294	4,814	110%	100%	62,367	5,294
Renewables/Demo. Residential		1	2	5	40%	$8,757	$37,444	$134,545	28%	3,804	19,079	84,090	23%	1	3	6	53%	87%	16,599	3
Renewables/Demo. Commercial		1	2	2	100%	$2,920	$12,456	$44,848	28%	18,953	21,877	28,030	78%	3	4	2	181%	87%	19,033	3
Home Weatherization		1,694	5,973	6,929	86%	$156,582	$650,292	$1,457,738	45%	441,311	1,401,869	3,425,430	41%	60	216	1,047	21%	91%	1,275,700	197
Res. New Construction		33	204	449	45%	$31,440	$264,884	$333,751	79%	50,895	369,415	911,804	41%	40	237	77	308%	98%	362,027	232
Energy Efficient Products		267	1,063	2,816	38%	$57,445	$259,079	$630,916	41%	190,794	524,551	1,294,742	41%	40	149	3,542	4%	98%	514,060	146
C&I Incentives Program		124	238	34	700%	$616,544	$1,805,460	$1,987,002	91%	8,831,992	15,441,575	17,000,000	91%	0	821	4,888	17%	96%	14,823,912	788
C&I Audit Program		36	67	139	48%	$200,734	$766,465	$774,551	99%	473,392	1,337,788	1,430,770	94%	21	214	778	27%	84%	1,123,742	180
C&I Small Business Direct Install		72	206	175	118%					1,098,232	3,045,736	3,000,000	102%	0	0	n/a		100%	3,045,736	0
C&I Retro-Commissioning Lite Program		33	57	70	81%	$949,384	$2,030,692	$2,187,808	93%	12,047,037	20,685,678	20,000,000	103%	0	0	n/a		97%	20,065,107	0
C&I HVAC Optimization Program		35	35	357	10%	$3,065	$21,549	$435,669	5%	12,985	12,985	65,000	20%	2	2	528	0%	80%	10,388	2
EECO (Volt Var) Residential		9	9	9	100%	$34,020	$334,734	$396,483	84%	381,447	3,712,115	3,801,405	98%	109	1,061	1,086	98%	100%	3,712,115	1,061
EECO (Volt Var) Commerical						$4,205	$41,372	$49,000	84%	413,234	4,021,458	4,118,189	98%	118	1,149	1,177	98%	100%	4,021,458	1,149
Subtotal		96,931	121,848	130,004	94%	$2,136,667	$9,076,736	$11,202,454	81%	26,704,445	81,280,612	90,347,731	90%	683	12,496	21,080	59%		77,964,319	12,202
INDIRECT COSTS																				
Staff Development & Prof. Organizations						$3,833	$34,595	$95,000	36%											
Computer System Development						$14,963	$126,164	$235,000	54%											
Marketing & Customer Awareness						$41,161	$195,668	$300,000	65%											
New Program Development						$0	$0	$210,000	0%											
General EE Management & Collaboration						$0	$0	$105,000	0%											
Codes Work						$0	$0	$100,000	0%											
MPS & Action Plan						$0	$0	$75,000	0%											
Evaluation & Related						$4,250	$56,624	$140,000	40%											
Subtotal						$64,207	$413,051	$1,260,000	33%											
PORTFOLIO TOTALS																				
Total Residential		96,692	535,749	496,875	108%	$411,417	$7,553,995	$9,121,956	83%	3,842,114	57,908,041	65,954,742	88%	542	12,796	19,574	65%		47,840,224	11,594
Total C&I		229	37,102	115,435	32%	$1,778,510	$7,254,013	$8,590,180	84%	22,895,825	68,866,041	80,734,101	85%	144	5,906	13,019	45%		61,036,319	5,193
Total Portfolio		96,993	573,057	612,485	94%	$2,254,134	$15,221,059	$18,972,136	80%	26,737,938	126,774,082	146,688,843	86%	687	18,702	32,593	57%		111,922,280	16,787

Core Programs

	Residential Home Energy Assessment	Residential Low Income Weatherization	Residential Lighting	Energy Efficient Schools - Kits	Energy Efficient Schools - Audits	C&I Rebate Programs
YTD kWh	2,181,517	1,529,696	15,747,122	1,736,190	516,338	23,782,606
Planning Goal	2,182,000	1,524,000	15,685,000	1,858,000	92,112	35,000,000

Core Plus Programs

	Appliance Recycling Program	Online Energy Check-up Program	Home Energy Reporting Program	Peak Reduction	Renewables/Demo. Residential	Renewables/Demo. Commercial	Home Weatherization	Res. New Construction	Energy Efficient Products	C&I Incentives Program	C&I Audit Program	C&I Small Business Direct Install	C&I Retro-Commissioning Lite Program	C&I HVAC Optimization Program	EECO (Volt Var) Residential	EECO (Volt Var) Commerical
YTD kWh	4,029,025	2,818,382	23,776,713	62,367	19,079	21,877	1,401,869	369,415	524,551	15,441,575	1,337,788	3,045,736	20,685,678	12,985	3,712,115	4,021,458
Planning Goal	3,181,339	3,750,932	28,256,000	0	84,090	28,030	3,425,430	911,804	1,294,742	17,000,000	1,430,770	3,000,000	20,000,000	65,000	3,801,405	4,118,189

Exhibit NM-5

I&M Discovery Request Response to CAC Set 5, Q2 DSM Historic Performance in Forecast

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2		Incremental													current filed
3		Energy (kWh)	Res - Low/Moderate Income	Res - Rebates	Res - Appliance Recycling	Res - Whole House	Res - URWP Loans	Res - Statewide Core Lighting	Res - Statewide Core Home Energy Assessments	Res - Statewide Core Income Qualified Weatherization	Res - Online Energy Checkup	C&I - Rebates Prescriptive	C&I - Incentives	R/C/I - School Energy Education	Res - Online Audit
4		2008					18,000	1,800,000							
5		2009					9,200	875,440							
6		Year 1 - 2010	467,000	9,816,000	2,469,000					90,000		4,079,000		12,000	
7		Year 2 - 2011	591,552	38,991,004	3,030,422	877,408						24,910,220		766,479	
8		Year 3 - 2012		(1,411,010)	4,260,656	15,295	779	21,229,646	4,237,391	1,723,888	465,733	38,491,566	5,451,966	2,063,010	
9		Year 4 - 2013			2,493,000	6,161,000		15,685,000		2,151,000		29,994,000	11,254,000	2,386,000	4,994,000
10		Year 5 - 2014			3,181,339	3,434,997		16,542,202		2,593,708	2,293,183	35,578,622	29,710,026	2,015,432	735,892
11															
12		Peak (kW)													
13		2008					3	164							
14		2009					1	79							
15		Year 1 - 2010	133	2,659	706					8		851		3	
16		Year 2 - 2011	169	10,490	866	14						5,086		219	
17		Year 3 - 2012		(403)	484	4	-	6,079	1,855	709	91	8,808	1,285	588	
18		Year 4 - 2013			1,785	1,784		4,481		616		15,151	7,397	683	3,280
19															
20															
21					lighting			lighting							

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1															
2	programs														
3	Res - New Construction	Res - Solar Siting	Res - Home Weatherization	Res - Home Energy Reporting	Res - Renewables & Demonstration	C&I Retro Commisioning Lite	C&I HVAC Optimization	C&I Audit	C&I New Construction	C&I Rebates	Res - Peak Reduction	Internal Facility / Other	Total	Energizing Indiana	I&M
4			471,000										2,289,000	-	489,000
5			291,000									3,299,037	4,474,677	-	300,200
6				259,000							26,331	1,755,214	18,973,545	102,000	17,116,331
7												491,492	69,658,577	766,479	68,400,606
8				3,662,381				100,691		687,018		8,588,707	89,567,717	29,940,953	45,586,091
9	-	-	997,000	11,994,000	28,000	21,845,000	4,996,000	6,494,000	-		-		121,472,000	20,222,000	89,996,000
10	236,432		2,395,292	7,517,350	24,420	28,489,293	3,051,608	6,501,040			-	7,919,594	152,220,429	21,151,342	93,439,467
11															
12															
13				95									262		
14				107								-	187		
15				7							175	-	4,542		
16												-	16,845		
17				1,046				29		149		-	20,724		
18	243	48	641	5,257	9	11,075	4,632	783	778		59		58,703		
19															
20															
21															

	AE
1	
2	
3	Total
4	489,000
5	300,200
6	17,218,331
7	69,167,085
8	75,527,044
9	110,218,000
10	114,590,808
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

Exhibit NM-6

I&M Discovery Request Response to CAC Set 1, Q11
Billing Energy and Demand for
Existing Indiana DSM Opt Out Customers

Indiana Michigan Power Company
Billing Energy and Demand for Existing Indiana DSM Opt Out Customers

Calendar 2014

	Billing kWh			Billing kW			Number of Accounts		
	Opt Out Customers	Total Class	Percentage of Total	Opt Out Customers	Total Class	Percentage of Total	Opt Out Customers**	Total Class***	Percentage of Total
GS	9,075,837	2,806,758,982	0.32%	58,724	10,126,643	0.58%	24	53,706	0.04%
LGS	5,304,189	1,557,688,186	0.34%	20,282	3,958,410	0.51%	2	1,637	0.12%
IP/IRP	850,655,228	4,161,134,157	20.44%	1,492,740	8,934,043	16.71%	19	244	7.79%
WSS	19,238,840	148,606,992	12.95%	49,303	377,749	13.05%	3	507	0.59%
MS	120,374	36,435,502	0.33%	882	128,470	0.69%	2	367	0.54%

Jan. - Oct. 2015*

	Billing kWh			Billing kW			Number of Accounts		
	Opt Out Customers	Total Class	Percentage of Total	Opt Out Customers	Total Class	Percentage of Total	Opt Out Customers**	Total Class**	Percentage of Total
GS	8,965,039	2,142,085,092	0.42%	58,724	8,731,743	0.67%	25	53,541	0.05%
LGS	0	1,480,763,835	0.00%	0	4,292,917	0.00%	0	1,998	0.00%
IP/IRP	742,725,319	3,594,074,436	20.67%	1,314,359	8,597,232	15.29%	20	251	7.97%
WSS	16,581,016	120,760,347	13.73%	41,869	340,555	12.29%	3	509	0.59%
MS	139,995	29,250,454	0.48%	1,046	120,570	0.87%	2	362	0.55%

*Data was compiled prior to the recording all November 2015 bills.

**Count of Opt Out Customers reflects all approved Opt Out accounts that were billed during the period.

***Customer counts are averages of the monthly counts.

Exhibit NM-7

I&M Discovery Request Response to CAC Set 8, Q1
I&M Housing Stock Statistics for
Counties in Service Area

Indiana and Michigan Power Company - Indiana
Housing Stock Statistics for Counties in Service Area

	2014	2015	2016
	Actual	Forecast/Actual	Forecast
Mobile Homes	33,943	33,555	33,230
Change from prior year	(420)	(388)	(325)
Single Family	547,770	549,575	551,758
Change from prior year	1,775	1,805	2,183
Multi-Family	119,128	119,628	120,285
Change from prior year	295	500	657

Source: U.S. Census Bureau and Moody Analytics

Exhibit NM-8

Cause No. 44634, NIPSCO Discovery Request
Response to CAC Set 2, Q6, Attachment A

NIPSCO	Number of Eligible Customers/ Accounts	Eligible Customer/ Accounts Total Load	Number of Opt Outs	Opt Out Load	Opt Outs as a % of Eligible Load	Total System Load	Opt Out Customers/ Accounts as a % of Total Load	Total C/I Load	Opt Out Customers/Accounts as a % of C/I Load	Number of Opt Outs by Customer Size
		MWh		MWh		MWh		MWh		
NIPSCO Opt Out 1	200 Customers representing 235 Accounts	9,221,625	25 Customers representing 69 Accounts	1,660,139	18%	16,760,588	9.9%	13,221,589	12.6%	2 > 50 MW 0 > 25 MW 3 > 10 MW 1 > 5 MW 10 > 2 MW 9 > 1 MW
NIPSCO as of 11/15/14 Opt Out 2	174 Customers representing 199 Accounts	7,878,413	25 Customers representing 112 Accounts	3,865,415	49%	16,760,588	23.1%	13,221,589	29.2%	2 > 50 MW 0 > 25 MW 0 > 10 MW 2 > 5 MW 14 > 2 MW 7 > 1 MW
Total NIPSCO Opt Out	Eligibility changed based usage		50 Customers representing 181 Accounts	5,525,554		16,760,588	33.0%	13,221,589	41.8%	4 > 50 MW 0 > 25 MW 3 > 10 MW 3 > 5 MW 24 > 2 MW 16 > 1 MW

Exhibit NM-9

Cause No. 43955 DSM 3, Duke Witness Douglas' Public Workpaper #2

DUKE ENERGY INDIANA, INC.

December 2014 YTD Non-Residential by Rate Class

Description	Billed KWH	Revenues	4/1/2014 Opt Out Billed KWH	4/1/2014 Opt Out Revenues	1/1/2015 Opt Out Billed KWH	1/1/2015 Opt Out Revenues	Participants Billed KWH	Participants Revenues
AL	-	$ -	-	$ -	-	$ -	-	$ -
CS	1,115,986,962	2,038,732	2,432,452	1,744	1,108,904	2,114	1,112,445,606	2,034,874
FS	499,083	907	-	-	-	-	499,083	907
HL	14,639	26	-	-	-	-	14,639	26
HLF	10,736,740,353	12,682,304	5,349,061,739	2,857,669	937,422,895	1,791,732	4,450,255,719	8,032,903
HLS	1,261,848	2,283	-	-	-	-	1,261,848	2,283
LLF	4,616,498,907	7,555,837	684,067,415	373,730	105,404,556	192,048	3,827,026,936	6,990,059
MHLS	4,327,091	7,887	-	-	-	-	4,327,091	7,887
MOLS	2,159,609	3,942	-	-	5,655	10	2,153,954	3,932
MS	2,507,498	4,576	176	-	793	1	2,506,529	4,575
OL	-	-	-	-	-	-	-	-
SL	41,421,428	74,938	-	-	751,461	1,359	40,669,967	73,579
TS	6,462,773	11,669	11,640	15	-	-	6,451,133	11,654
UOLS 1/	108,318,850	195,089	1,348,377	833	1,340,264	2,436	105,630,209	191,820
UT	-	-	-	-	-	-	-	-
WHTL	2,892	5	-	-	-	-	2,892	5
WP	149,647,087	262,274	8,993,690	4,908	160,160	290	140,493,237	257,076
CUSTOMER D	40,165,365	72,659	40,165,365	72,659	-	-	-	-
CUSTOMER O FIRM	1,156,802,970	115,349	1,156,802,970	115,349	-	-	-	-
CUSTOMER O INTER	-	728,116	-	728,116	-	-	-	-
CUSTOMER O INTR2	-	-	-	-	-	-	-	-
CUSTOMER L FIRM	128,826,317	86,299	128,826,317	86,299	-	-	-	-
CUSTOMER L RTP	80,516,252	47,711	80,516,252	47,711	-	-	-	-
CUSTOMER C TOU	58,839,120	26,234	58,839,120	26,234	-	-	-	-
CUSTOMER C HLF - BULK	443,758,160	302,878	443,758,160	302,878	-	-	-	-
CUSTOMER J - HLF	175,362,172	121,494	175,362,172	121,494	-	-	-	-
Non-Residential Sales 2/	18,870,119,376	$ 24,341,209	8,130,185,845	$ 4,739,639	1,046,194,688	$ 1,989,990	9,693,738,843	$ 17,611,580

1/ Includes KWH sales for OL and AL rate groups due to rate migration.
2/ Previously excluded RTP and TOU Sales. These customers have now opted out, so their KWH
   is included for allocation purposes.

Exhibit NM-10

Cause No. 44645, Vectren Discovery Request Response to CAC Set 2, Q5

Line No.	Reference	Tariff	2014 Eligible Premises	2014 2014 KW Eligible	2014 2014 KWH Eligible
1		SGS	93	-	675,570
2		DGS1	106	24,176	6,894,657
3		DGS2	51	52,407	20,040,609
4		DGS3	30	359,836	110,304,953
5	(2+3+4)	Total DGS	187	436,419	137,240,219
6		OSS	29	42,464	11,887,808
7		LP	73	3,429,796	1,710,186,463
8		HLF	2	1,532,802	1,002,492,000
9	(7+8)	Total Large	75	4,962,598	2,712,678,463
10	(1+5+6+9)	**Total**	**384**	**5,441,480**	**2,862,482,060**

Line No.	Reference	Tariff	2014 Opt Out Premises	2014 2014 Opt Out KW	2014 2014 Opt Out KWH	2014 2014 Total KWH	2014 % of Total Eligible	2014 % of Total
11		SGS	39	-	268,227	65,505,983	40%	0%
12		DGS1	25	7,376	2,699,562		39%	0%
13		DGS2	19	28,220	11,736,712		59%	1%
14		DGS3	10	115,834	37,500,255		34%	3%
15	(12+13+14)	Total DGS	54	151,430	51,936,529	1,144,032,437	38%	5%
16		OSS	16	3,812	1,211,864	97,403,667	10%	1%
17		LP	23	1,845,927	946,636,263	1,802,105,988	55%	53%
18		HLF	2	1,532,802	1,002,492,000	1,002,492,000	100%	100%
19	(17+18)	Total Large	25	3,378,729	1,949,128,263	2,804,597,988	72%	69%
20	(11+15+16+19)	**Total**	**134**	**3,533,971**	**2,002,544,883**	**4,111,540,075**	**70%**	**49%**

Line No.	Reference	Tariff	2015 Opt Out Premises	2015 2014 Opt Out KW	2015 2014 Opt Out KWH	2015 2014 Total KWH	2015 % of Total Eligible	2015 % of Total
21		SGS	8	-	35,808	65,505,983	5%	0%
22		DGS1	17	2,663	783,175		11%	0%
23		DGS2	4	4,179	1,194,200		6%	0%
24		DGS3	5	48,240	19,007,800		17%	2%
25	(22+23+24)	Total DGS	26	55,081	20,985,175	1,144,032,437	15%	2%
26		OSS	3	33,950	9,436,500	97,403,667	79%	10%
27		LP	9	281,090	116,217,000	1,802,105,988	7%	6%
28		HLF	0	-	-	1,002,492,000	0%	0%
29	(27+28)	Total Large	9	281,090	116,217,000	2,804,597,988	4%	4%
30	(21+25+26+29)	**Total**	**46**	**370,121**	**146,674,483**	**4,111,540,075**	**5%**	**4%**

Line No.	Reference	Tariff	Total 2014 2015 Opt Out Premises	Total 2014 2015 2014 Opt Out KW	Total 2014 2015 2014 Opt Out KWH	Total 2014 2015 2014 Total KWH	Total 2014 & 2015 % of Total Eligible	Total 2014 & 2015 % of Total
31		SGS	47	-	304,035	65,505,983	45%	0%
32		DGS1	42	10,038	3,482,737		51%	0%
33		DGS2	23	32,399	12,930,912		65%	1%
34		DGS3	15	164,074	56,508,055		51%	5%
35	(32+33+34)	Total DGS	80	206,511	72,921,704	1,144,032,437	140%	6%
36		OSS	19	37,762	10,648,364	97,403,667	90%	11%
37		LP	32	2,127,017	1,062,853,263	1,802,105,988	62%	59%
38		HLF	2	1,532,802	1,002,492,000	1,002,492,000	100%	100%
39	(37+38)	Total Large	34	3,659,819	2,065,345,263	2,804,597,988	106%	74%
40	(31+35+36+39)	**Total**	**180**	**3,904,092**	**2,149,219,366**	**4,111,540,075**	**75%**	**52%**

Exhibit NM-11

I&M Discovery Request Response to CAC Set 1, Q13

INDIANA MICHIGAN POWER COMPANY
CITIZENS ACTION COALITION'S
DATA REQUEST SET NO. 1
IURC CAUSE NO. 43827 DSM 5
DATA REQUEST NO Q-1-13

REQUEST

Please provide a summary of all actions the Company has taken to acquire and retain opt out eligible customers (whether they have opted out or not) in its energy efficiency and demand side management programs since March 28, 2014.

RESPONSE

I&M mailed letters to eligible opt out customers in June 2014 for the July 2014 notification date and in September 2014 for the November 2014 notification date. I&M's website was updated to allow customers to view opt out information on-line. Opt out and opt in forms are located on the Indiana Rates and Tariffs web page of the I&M website.

Exhibit NM-12
ACEEE
Review of Lost Revenue Adjustment Mechanisms
June 2015

Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms

Annie Gilleo, Marty Kushler, Maggie Molina, and Dan York

June 2015

Report U1503

Contents

About the Authors

Annie Gilleo joined ACEEE in 2013. She is the lead author for the *State Energy Efficiency Scorecard*, and she conducts research on energy efficiency resource standards, utility regulatory structures, and other state-level efficiency initiatives.

Marty Kushler directs numerous national studies of utility-sector energy efficiency policies and programs and provides technical assistance to help advance energy efficiency policies in many states. He has been directing research and evaluation regarding energy efficiency and utilities for three decades, has been widely published, and has been a consultant for numerous states and the federal government. He joined ACEEE in 1998 following a career with the Michigan Public Service Commission.

Maggie Molina is the director of the ACEEE Utilities, State, and Local Policy Program. She conducts energy efficiency program and policy research and analysis, and she provides technical assistance on energy efficiency policy and programs to audiences including state and local policymakers, regulators, utilities, and efficiency program administrators. Since joining ACEEE in 2005, she has authored numerous reports on state policy and utility-sector energy efficiency topics, including the first editions of the *State Energy Efficiency Scorecard*, state-level energy efficiency potential studies, utility business models, the cost of saved energy, and next-generation efficiency programs.

Dan York has more than 20 years of experience in researching, analyzing, and implementing energy efficiency programs and policies. He is widely recognized for his work tracking and analyzing trends and emerging issues in utility-sector energy efficiency programs. His entire educational and professional experience has focused on energy efficiency and conservation as the foundations for a sustainable economy. He joined ACEEE in 2001.

Acknowledgments

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

vi

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.

1

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.

■ Revenue requirement

◌ Lost revenue due to efficiency investments

◌ Revenue net of LRAM

Revenue

Time
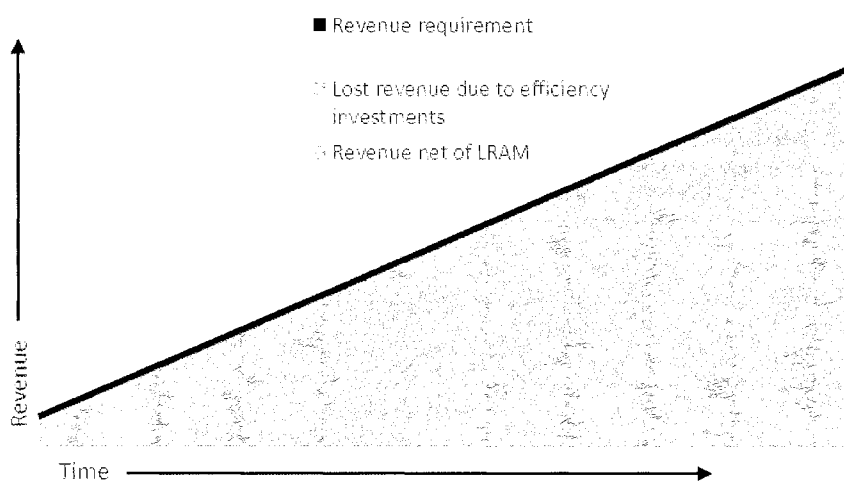
Figure 1. Theoretical application of LRAM to address revenue shortfall. A utility's revenue requirement is shown in black. In a traditional utility business model, savings from efficiency investments eliminate potential energy sales, thereby reducing a utility's revenue (shown in green). Under the LRAM 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.
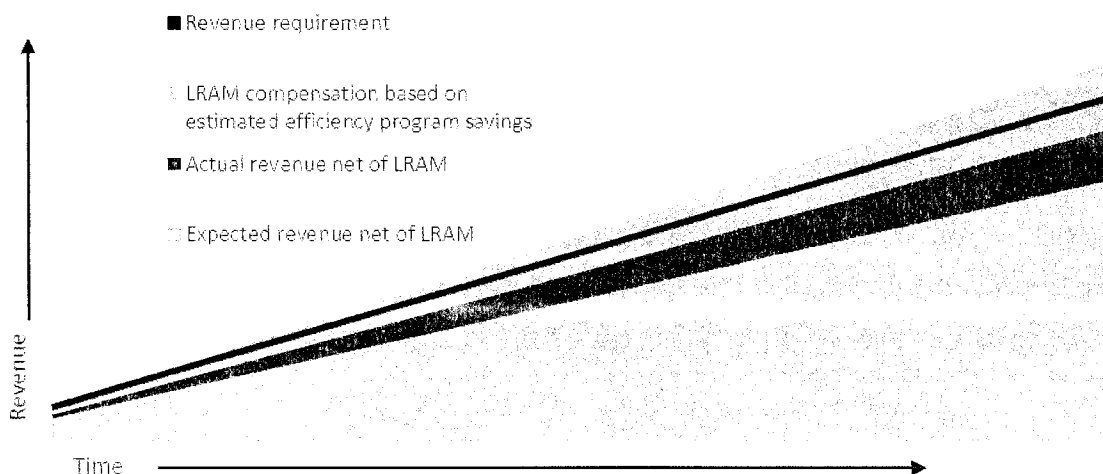
Figure 2. Potential problem with LRAM if sales are above forecast after energy efficiency programs are enacted. The dark green area is revenue above what was predicted in the test case. By evaluating savings generated through efficiency, utilities are often still able to recover the total amount of lost 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/

5

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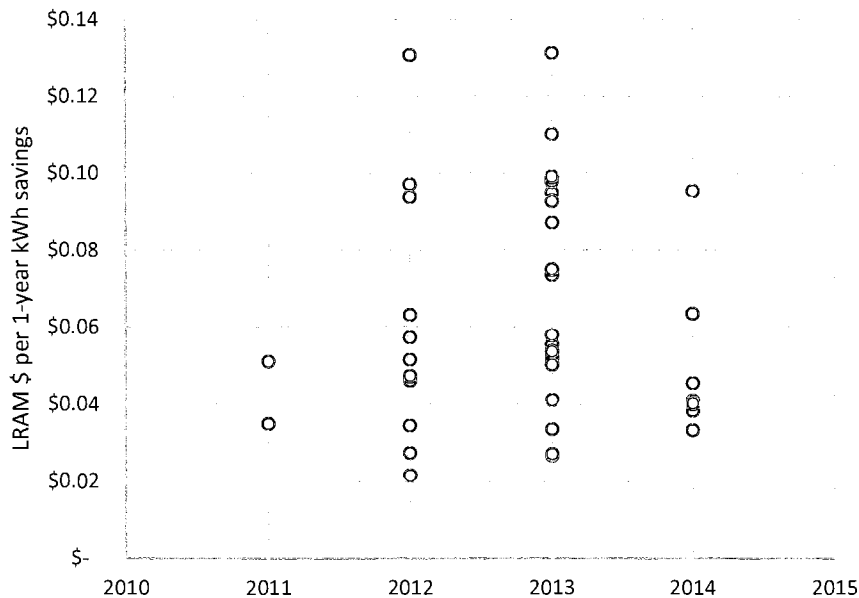
Figure 4. Lost revenue adjustment dollars recovered per kWh savings for electricity efficiency programs. Savings are annual one-year program savings. Data supplied by state public utility commissions. Note that not all states were able to provide data.

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.

9
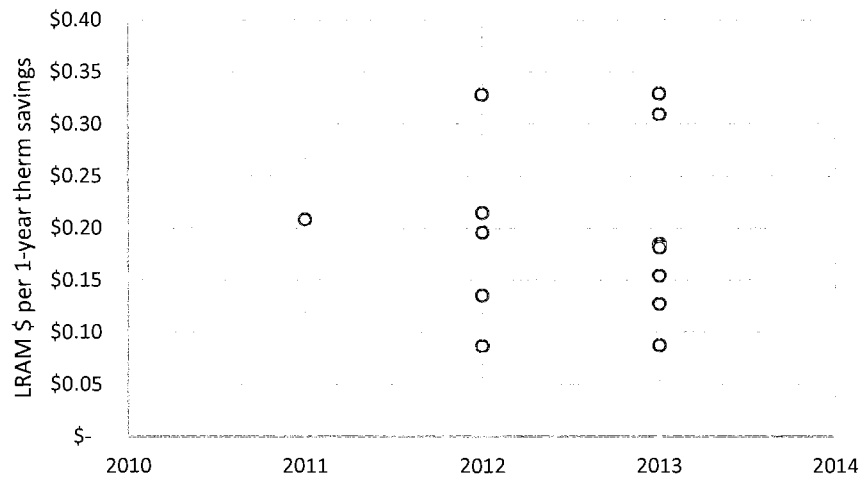
Figure 5. Lost revenue adjustment dollars recovered per therm savings for natural gas efficiency programs. Savings are annual one-year program savings. Data supplied by state public utility commissions.

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.

10

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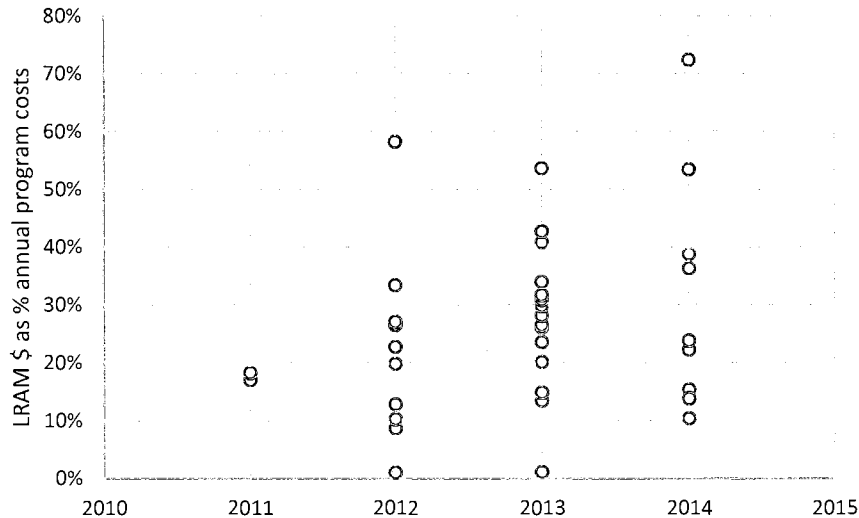
Figure 6. Lost revenue dollars eligible for recovery as a percentage of electricity efficiency program expenditures

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.

11

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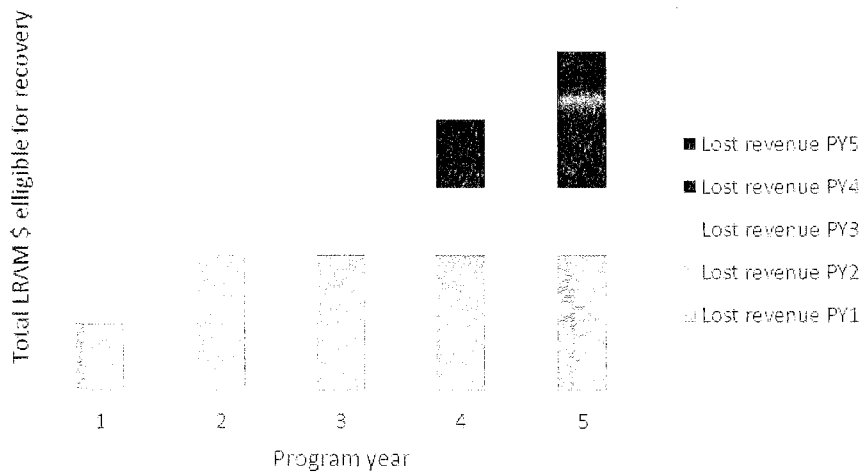
Figure 7. Scenario in which lost revenues pancake over a five-year period between rate cases. Lost revenues typically reset between rate cases, and rates are recalculated on the basis of a more current test year. For these reasons, timely rate cases help minimize pancaking and over-earnings.

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 are able to collect lost revenues associated with a particular program year.
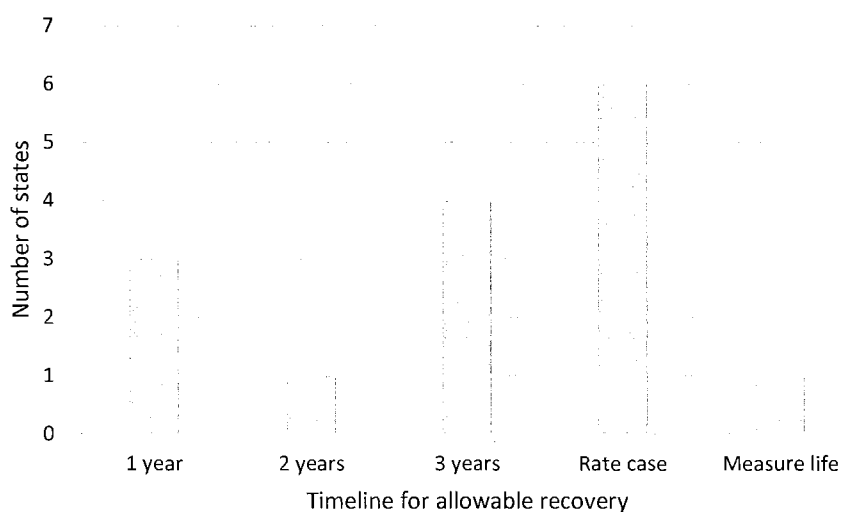
Figure 8. Length of time over which lost revenue may be recovered for a single program year. Data from state responses.

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.

13

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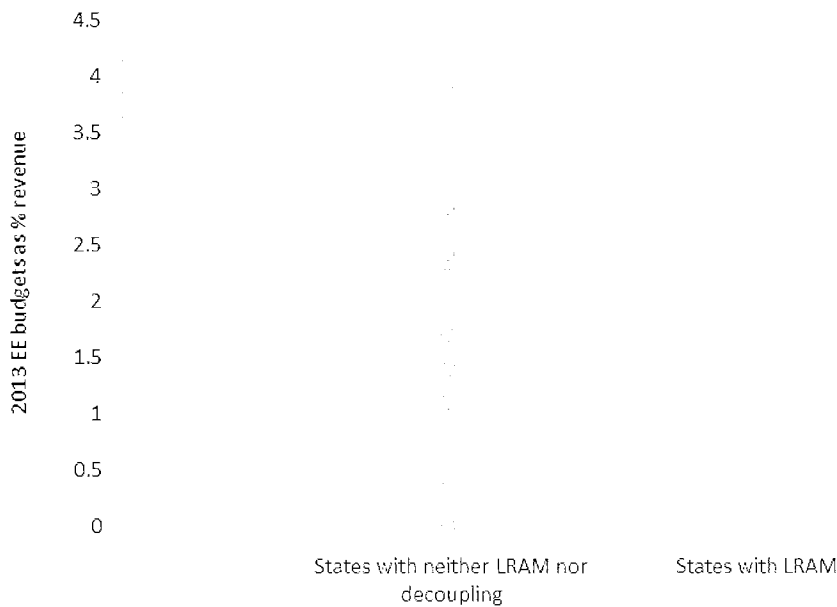
Figure 9. Efficiency budgets in states with LRAM compared with states having no revenue adjustment mechanism

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.

14
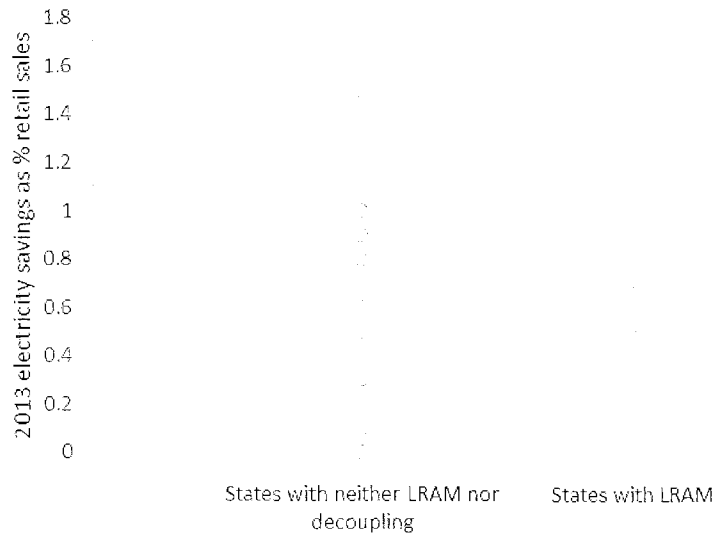
Figure 10. Electricity savings in states with LRAM compared with states having no revenue adjustment mechanism

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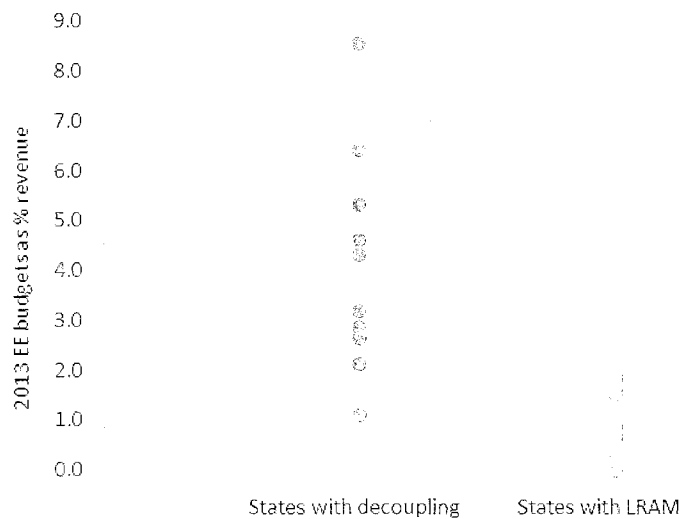
Figure 11. Electricity efficiency budgets in states with LRAM compared with states that have decoupling

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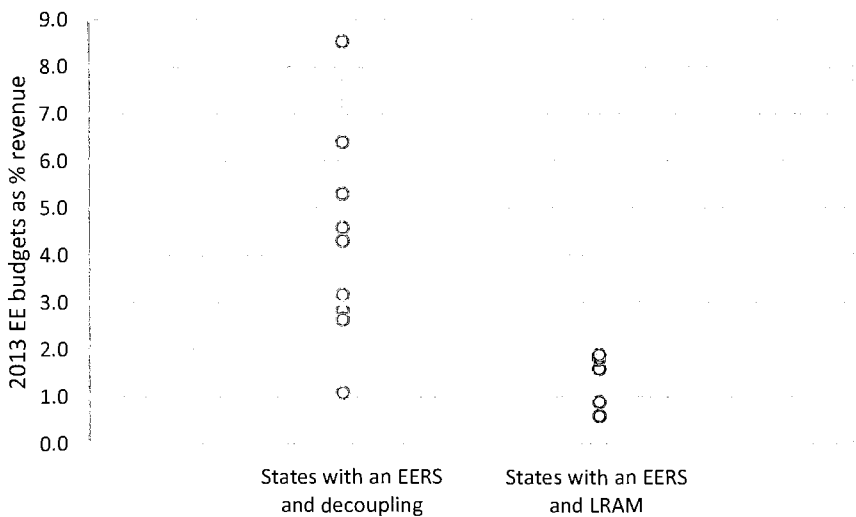
Figure 13. States with LRAM compared with states with decoupling when an EERS policy is in place

16

Figure 14 shows the results of this analysis for statewide electricity savings in 2013.
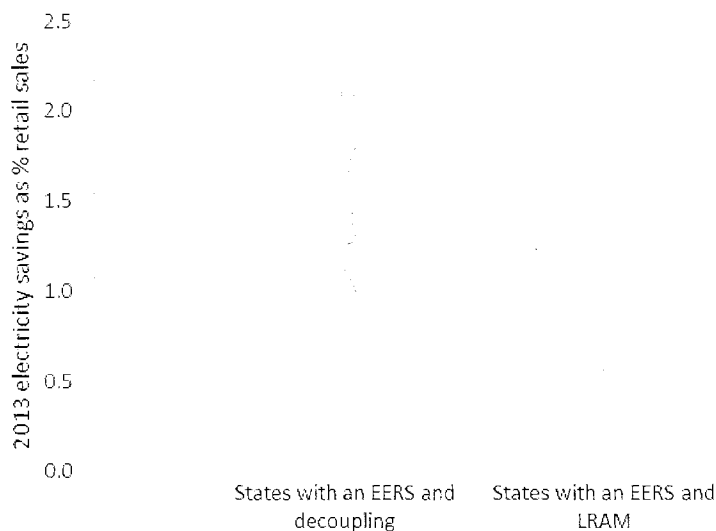
Figure 14. States with LRAM compared with states with decoupling when an EERS policy is in place

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.

17

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

---

[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).

20

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.

References

AEP (American Electric Power). 2014. "AEP Reports Strong First-Quarter 2014 Earnings; Increases 2014 Earnings Guidance." https://www.aep.com/investors/NewsReleasesAndEmailAlerts/financialNews.aspx?id=1867.

Downs, A., and C. Cui. 2014. *Energy Efficiency Resource Standards: A New Progress Report on State Experience*. Washington, DC: American Council for an Energy-Efficient Economy. http://www.aceee.org/research-report/u1403.

EPA (US Environmental Protection Agency). 2007. *Aligning Utility Incentives with Investment in Energy Efficiency: A Resource of the National Action Plan for Energy Efficiency*. Washington, DC: EPA. http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

Gilleo, A., A. Chittum, K. Farley, M. Neubauer, S. Nowak, D. Ribeiro, and S. Vaidyanathan. 2014. *The 2014 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. http://www.aceee.org/research-report/u1408.

Hayes, S., S. Nadel, M. Kushler, and D. York. 2011. *Balancing Interests: A Review of Lost Revenue Adjustment Mechanisms for Utility Energy Efficiency Programs*. Washington, DC: ACEEE. http://aceee.org/research-report/u114.

Morgan, P. 2013. *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs, and Observations*. Lake Oswego, OR: Graceful Systems LLC.

NARUC (National Association of Regulatory Utility Commissioners). 2007. *Decoupling for Electric and Gas Utilities: Frequently Asked Questions*. Washington, DC: NARUC. http://epa.gov/statelocalclimate/documents/pdf/supp_mat_decoupling_elec_gas_utilities.pdf.

———. 2008. *Results of Survey Taken by the Accounting Division of the Public Staff: North Carolina Utilities Commission Regarding Regulatory Treatment of Margins on Intersystem Sales*. Washington, DC: NARUC. http://www.naruc.org/Publications/Section%206-North%20Carolina-BPM%20Survey%20Response%20Survey%20(3).doc.

Nowak, S., B. Baatz, M. Kushler, M. Molina, and D. York. 2015. *Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency*. Washington, DC: ACEEE.

RAP (Regulatory Assistance Project). 2011. *Revenue Regulation and Decoupling: A Guide to Theory and Application*. Montpelier, VT: Regulatory Assistance Project.

Sciortino, M., M. Neubauer, S. Vaidyanathan, A. Chittum, S. Hayes, S. Nowak, and M. Molina. 2011. *The 2011 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. http://aceee.org/research-report/e115.

22

Vilbert, M., J. Wharton, C. Gibbons, M. Rosenberg, and Y.W. Neo. 2014. *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation.* Cambridge, MA: The Brattle Group.

York, D., M. Kushler, S. Hayes, S. Sienkowski, and C. Bell. 2013. *Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation.* Washington, DC: ACEEE. http://aceee.org/research-report/u133.

York, D., and M. Kushler. 2011. *The Old Model Isn't Working: Creating the Energy Utility for the 21st Century.* Washington, DC: ACEEE. http://aceee.org/white-paper/the-old-model-isnt-working.

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

28

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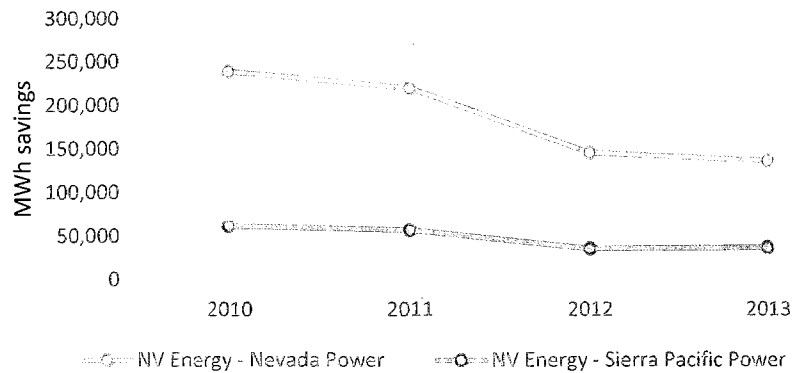
Figure B1. Net incremental savings (MWh) in 2010–2013 for Nevada energy companies. *Sources:* Utility annual reports.

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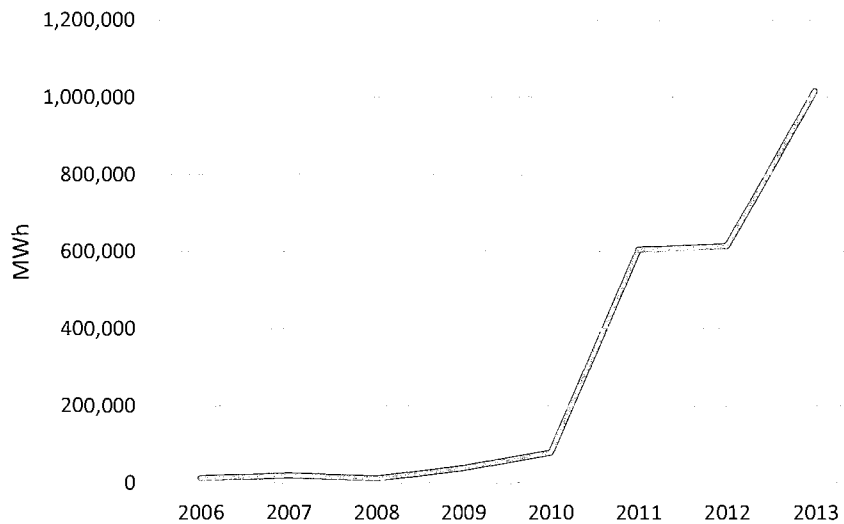
Figure B3. Indiana energy savings (MWh), 2006-2013. *Source:* ACEEE *State Energy Efficiency Scorecard* 2007-2014.

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.

---

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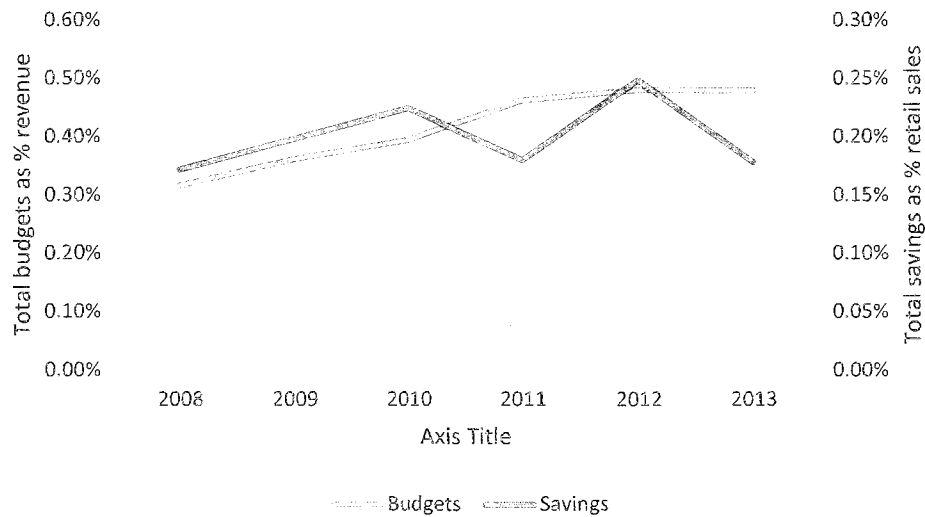
Figure B4. Total statewide spending and savings on energy efficiency, 2008-2013. *Source:* ACEEE *State Energy Efficiency Scorecard,* 2008-2014.

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

44

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

46

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

50

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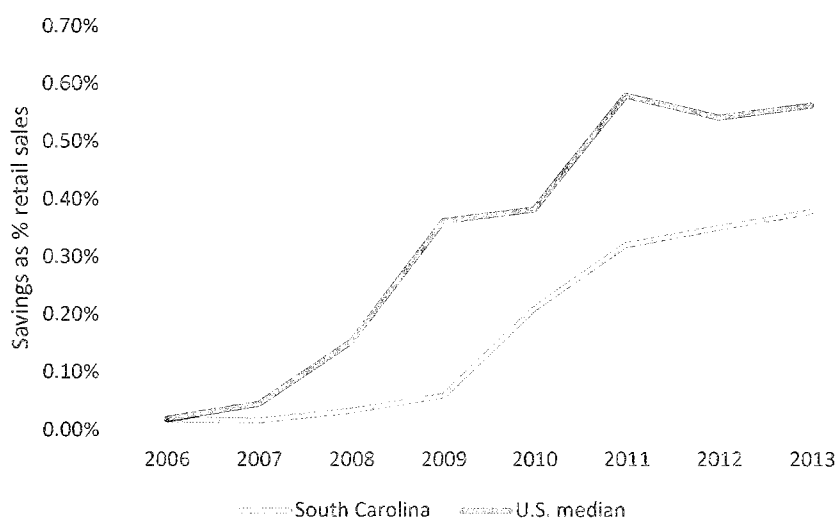
Figure B6. Net incremental savings as a percentage of retail sales for South Carolina compared with US median electricity savings. *Source:* ACEEE *State Energy Efficiency Scorecard* 2007–2014.

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.

Exhibit NM-13

I&M Discovery Request Response to CAC Set 1, Q2, I&M DSM 2016 Plan Exhibits, 2016 Residential Home Energy Products Tab

	2016 Home Energy Products Program	kWh/unit	kW/unit	unit	EUL	# Units	Total Gross Energy Savings (kWh) *	Total Gross Demand (kW)	Avg Incentive per	Total Incentive $	NTG	Incentive / kWh ($/kWh)	Net Total Energy Savings
3	**Lighting**												
5	9 W Spiral GS CFL	16.05	0.002	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.06	0
6	10 W Spiral GS CFL	17.84	0.002	bulb	5	-	-	-	$ 0.95	$ -	52%	$0.05	0
7	13 W Spiral GS CFL	23.19	0.003	bulb	5	150,000	3,477,825	411.7	$ 0.95	$ 142,500.00	52%	$0.04	1,808,469
8	14 W Spiral GS CFL	24.97	0.003	bulb	5	75,000	1,872,675	221.7	$ 0.90	$ 67,500.00	52%	$0.04	973,791
9	15 W Spiral GS CFL	26.75	0.003	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.04	0
10	18 W Spiral GS CFL	31.32	0.004	bulb	5	5,000	156,600	18.5	$ 0.90	$ 4,500.00	52%	$0.03	81,432
11	19 W Spiral GS CFL	33.06	0.004	bulb	5	5,000	165,300	19.6	$ 0.90	$ 4,500.00	52%	$0.03	85,956
12	20 W Spiral GS CFL	34.80	0.004	bulb	5	5,000	174,000	20.6	$ 0.90	$ 4,500.00	52%	$0.03	90,480
13	23 W Spiral GS CFL	41.22	0.005	bulb	5	45,000	1,854,927	219.6	$ 0.90	$ 40,500.00	52%	$0.02	964,562
14	26 W Spiral GS CFL	46.60	0.006	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.02	0
15	42 W Spiral CFL	75.27	0.009	bulb	5	3,868	291,154	34.5	$ 0.90	$ 3,481.20	52%	$0.01	151,400
16	7 W Specialty CFL	16.05	0.001	bulb	5	350	5,618	0.5	$ 0.90	$ 315.00	52%	$0.06	2,921
17	9 W Specialty CFL	16.05	0.002	bulb	5	3,713	59,599	7.1	$ 0.90	$ 3,341.70	52%	$0.06	30,992
18	11 W Specialty CFL	19.62	0.002	bulb	5	347	6,808	0.8	$ 1.00	$ 347.00	52%	$0.05	3,540
19	12 W Specialty CFL	21.40	0.003	bulb	5	2,547	54,511	6.5	$ 0.90	$ 2,292.30	52%	$0.04	28,346
20	13 W Specialty CFL	23.19	0.003	bulb	5	6,066	140,643	16.7	$ 1.00	$ 6,066.00	52%	$0.04	73,134
21	14 W Specialty CFL	24.97	0.003	bulb	5	8,263	206,319	24.4	$ 0.90	$ 7,436.70	52%	$0.04	107,286
22	15 W Specialty CFL	26.75	0.003	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.04	0
23	19 W Specialty CFL	33.06	0.004	bulb	5	1,365	45,127	5.3	$ 0.90	$ 1,228.50	52%	$0.03	23,466
24	23 W Specialty CFL	41.22	0.005	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.02	0
25	26 W Specialty CFL	46.60	0.006	bulb	5	66	3,075	0.4	$ 1.00	$ 66.00	52%	$0.02	1,599
26	32 W Specialty CFL	57.35	0.007	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.02	0
27	42 W Specialty CFL	75.27	0.009	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.01	0
28	55 W Specialty	98.57	0.012	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.01	0
29	68 W Specialty CFL	121.87	0.014	bulb	5	-	-	-	$ 1.00	$ -	52%	$0.01	0
30	33 W 3 Way CFL	59.14	0.007	bulb	5	2,823	166,960	19.8	$ 0.90	$ 2,540.70	52%	$0.02	86,819
31	7 W Specialty LED	16.05	0.001	bulb	15	4,143	66,501	6.1	$ 3.00	$ 12,429.00	52%	$0.19	34,581
32	9 W Specialty LED	16.05	0.002	bulb	15	1,066	17,111	2.0	$ 3.00	$ 3,198.00	52%	$0.19	8,898
33	11 W Specialty LED	19.62	0.002	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.15	0
34	12 W Specialty LED	21.40	0.003	bulb	15	217	4,644	0.5	$ 3.00	$ 651.00	52%	$0.14	2,415
35	13 W Specialty LED	23.19	0.003	bulb	15	296	6,863	0.8	$ 3.00	$ 888.00	52%	$0.13	3,569
36	14 W Specialty LED	24.97	0.003	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.12	0
37	15 W Specialty LED	26.75	0.003	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.11	0
38	19 W Specialty LED	33.06	0.004	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.09	0
39	23 W Specialty LED	41.22	0.005	bulb	15	2,100	86,563	10.2	$ 3.00	$ 6,300.00	52%	$0.07	45,013
40	26 W Specialty LED	46.60	0.006	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.06	0
41	32 W Specialty LED	57.35	0.007	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.05	0
42	42 W Specialty LED	75.27	0.009	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.04	0
43	55 W Specialty LED	98.57	0.012	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.03	0
44	13 W Retrofit LED	23.19	0.003	bulb	15	4,206	97,518	11.5	$ 3.00	$ 12,618.00	52%	$0.13	50,709
45	33 W 3 Way LED	59.14	0.007	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.05	0
46	9.5 W A Lamp LED	29.86	0.004	bulb	15	30,000	895,785	106.1	$ 3.00	$ 90,000.00	52%	$0.10	465,808
47	11 W A Lamp LED	31.33	0.004	bulb	15	12,000	375,936	44.5	$ 3.00	$ 36,000.00	52%	$0.10	195,487
48	13.5 W A Lamp LED	28.88	0.003	bulb	15	20,000	577,610	68.4	$ 3.00	$ 60,000.00	52%	$0.10	300,357
49	18 W A Lamp LED	34.27	0.004	bulb	15	150,000	5,139,750	609.0	$ 3.00	$ 450,000.00	52%	$0.09	2,672,670
50	9.5 W BR 30 LED	29.86	0.004	bulb	15	2,169	64,765	7.7	$ 3.00	$ 6,507.00	52%	$0.10	33,678
51	15 W BR30 LED	26.75	0.003	bulb	15	3,448	92,243	10.9	$ 3.00	$ 10,344.00	52%	$0.11	47,966
52	18 W PAR 38 LED	34.27	0.004	bulb	15	3,222	110,402	13.1	$ 3.00	$ 9,666.00	52%	$0.09	57,409
53	LED Night Light	13.60	0.003	bulb	15	-	-	-	$ 3.00	$ -	52%	$0.22	0
54	**Efficient Lighting**				9.65	547,275	16,216,832	1,919		$ 989,716.10		$0.06	8,432,753

	Efficient Products	kWh/unit	kW/unit	unit	EUL	# of Units	Total Gross Energy Savings (kWh)	Total Gross Demand Savings (kW)	Incentive ($)	Total Incentive ($)	Net to Gross	Incentive / kWh ($/kWh)	Net Total Energy Savings (kWh)
58	Programmable Tstat - Central Air Conditioning	95.91	0.000	Unit	15	180	17,263	0	$70	$12,600	52%	$0.73	8,977
59	Programmable Tstat - HP	475.81	0.000	Unit	15	94	44,727	0	$70	$6,580	52%	$0.15	23,258
60	Heat Pump Upgrade to => SEER 15 / HPF =>8.2	419.89	0.308	Unit	18	50	20,994	15	$200	$10,000	52%	$0.48	10,917
61	Heat Pump Upgrade to => SEER 16 / HPF =>8.7	790.90	0.495	Unit	18	15	11,863	7	$300	$4,500	52%	$0.38	6,169
62	Heat Pump Upgrade to => SEER 17 / HPF =>9.2	1121.11	0.569	Unit	18	30	33,633	17	$400	$12,000	52%	$0.36	17,489
63	Heat Pump Upgrade to => SEER 18 / HPF =>10.1	1601.99	0.684	Unit	18	5	8,010	3	$500	$2,500	52%	$0.31	4,165
64	Ductless HP Replacement of HP to 17 SEER 9.5 HSPF	1276.71	0.101	Unit	18	8	10,214	1	$100	$800	52%	$0.08	5,311
65	Ductless HP Replacement of HP to 19 SEER 9.5 HSPF (or greater	1355.89	0.146	Unit	18	12	16,271	2	$200	$2,400	52%	$0.15	8,461
66	Ductless HP Replacement of HP to 21 SEER 10 HSPF or greater	1658.59	0.187	Unit	18	12	19,903	2	$250	$3,000	52%	$0.15	10,350
67	Ductless HP Replacement of HP 23 SEER 10 HSPF or greater	1711.54	0.225	Unit	18	4	6,846	1	$300	$1,200	52%	$0.18	3,560
68	Ductless HP Displacement of Elec Resistance to 17 SEER 9.5 HSPF	8675.78	0.101	Unit	18	4	34,703	0	$300	$1,200	52%	$0.03	18,046
69	Ductless HP Displacement of Elec Resistance to 19 SEER 9.5 HSPF	8754.95	0.146	Unit	18	12	105,059	2	$400	$4,800	52%	$0.05	54,631
70	Ductless HP Displacement of Elec Resistance to 21 SEER 10 HSPF	9057.65	0.187	Unit	18	12	108,692	2	$500	$6,000	52%	$0.06	56,520
71	Ductless HP Displacement of Elec Resistance 23 SEER or greater 10 HSPF	9110.60	0.225	Unit	18	4	36,442	1	$550	$2,200	52%	$0.06	18,950
72	Central Air Conditioner Upgrade 15 SEER or greater 12 EER or greater	244.64	0.646	Unit	18	175	42,812	113	$200	$35,000	52%	$0.82	22,262
73	Efficient ECM fan motor	733.00	0.066	Unit	10	150	109,950	10	$150	$22,500	52%	$0.20	57,174
74	HP Water Heater 10 to 50 MBH	529.58	0.072	Unit	10	0	0	0		$0	52%	$0.00	0
75	HP Water Heater Energy Star EF >=2.0	1604.80	0.218	Unit	10	85	136,408	18	$350	$29,750	52%	$0.22	70,932
76	HP Water Heater 100 to 300 MBH	3209.60	0.435	Unit	10	0	0	0		$0	52%	$0.00	0
77	VSD Pool Pumps HP 1.0	781.72	1.162	Unit	10	5	3,909	6	$50	$250	52%	$0.06	2,032
78	VSD Pool Pumps HP 1.5	1172.57	1.742	Unit	10	8	9,381	14	$50	$400	52%	$0.04	4,878
79	VSD Pool Pumps HP 2	1563.43	2.323	Unit	10	10	15,634	23	$50	$500	52%	$0.03	8,130
80	ENERGY STAR Ceiling Fan	107.61	0.020	Unit	10	25	2,690	0	$25	$625	52%	$0.23	1,399
81	ENERGY STAR Ceiling Fan Instant Rebate	107.61	0.020	Unit	10	0	0	0	$25	$0	52%	$0.23	0
82	ENERGY STAR Dehumidifier	213.00	0.048	Unit	10	200	42,600	10	$25	$5,000	52%	$0.12	22,152
83	ENERGY STAR Dehumidifier Instant Rebate	213.00	0.048	Unit	10	0	0	0	$25	$0	52%	$0.12	D
84													
85	**Efficient Products**				14.72	1,100	838,004	249		$163,805		$0.20	435,763
87	**Total Home Energy Products Program**				9.90	548,375	17,054,836			$ 1,153,521.10			8,868,516

	O	P	Q	R	S	T	U	V	W	X
1										
2	Net Total Demand	Gross Lifetime Savings (kWh)	Net Lifetime Savings (kWh)	% of Total Bulbs	% of Total Lighting kWh		Source of Savings estimates	Incremental Cost from MEMD		
3										
4										
5	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.04		
6	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.04		
7	214.11	17,389,125	9,042,345	27.409%	21.446%		IND TRM Page 15	$ 1.20		
8	115.29	9,363,375	9,363,375	13.704%	11.548%		IND TRM Page 15	$ 1.20		
9	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.20		
10	9.64	783,000	783,000	0.914%	0.966%		IND TRM Page 15	$ 1.20		
11	10.18	826,500	826,500	0.914%	1.019%		IND TRM Page 15	$ 1.20		
12	10.71	870,000	870,000	0.914%	1.073%		IND TRM Page 15	$ 1.20		
13	114.20	9,274,635	9,274,635	8.223%	11.438%		IND TRM Page 15	$ 1.47		
14	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.64		
15	17.92	1,455,768	1,455,768	0.707%	1.795%		IND TRM Page 15	$ 1.64		
16	0.27	28,090	28,090	0.064%	0.035%		IND TRM Page 15	$ 1.67		
17	3.67	297,996	297,996	0.678%	0.368%		IND TRM Page 15	$ 1.67		
18	0.42	34,038	34,038	0.063%	0.042%		IND TRM Page 15	$ 1.67		
19	3.36	272,554	272,554	0.465%	0.336%		IND TRM Page 15	$ 1.67		
20	8.66	703,216	703,216	1.108%	0.867%		IND TRM Page 15	$ 1.67		
21	12.70	1,031,594	1,031,594	1.510%	1.272%		IND TRM Page 15	$ 1.67		
22	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
23	2.78	225,635	225,635	0.249%	0.278%		IND TRM Page 15	$ 1.67		
24	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
25	0.19	15,377	15,377	0.012%	0.019%		IND TRM Page 15	$ 1.67		
26	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
27	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
28	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
29	0.00	0	0	0.000%	0.000%		IND TRM Page 15	$ 1.67		
30	10.28	834,798	834,798	0.516%	1.030%		IND TRM Page 15	$ 3.75		
31	3.18	997,520	997,520	0.757%	0.410%		IND TRM Page 22	$ 21.00		
32	1.05	256,663	256,663	0.195%	0.106%		IND TRM Page 22	$ 21.00		
33	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
34	0.29	69,664	69,664	0.040%	0.029%		IND TRM Page 22	$ 21.00		
35	0.42	102,944	102,944	0.054%	0.042%		IND TRM Page 22	$ 21.00		
36	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
37	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
38	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
39	5.33	1,298,449	1,298,449	0.384%	0.534%		IND TRM Page 22	$ 21.00		
40	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
41	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
42	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 28.00		
43	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 36.00		
44	6.00	1,462,773	1,462,773	0.769%	0.601%		IND TRM Page 22	$ 21.00		
45	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 21.00		
46	55.19	13,436,775	13,436,775	5.482%	5.524%		IND TRM Page 22	$ 7.00		
47	23.16	5,639,040	5,639,040	2.193%	2.318%		IND TRM Page 22	$ 7.00		
48	35.59	8,664,150	8,664,150	3.654%	3.562%		IND TRM Page 22	$ 7.00		
49	316.68	77,096,250	77,096,250	27.409%	31.694%		IND TRM Page 22	$ 7.00		
50	3.99	971,479	971,479	0.396%	0.399%		IND TRM Page 22	$ 40.00		
51	5.68	1,383,639	1,383,639	0.630%	0.569%		IND TRM Page 22	$ 40.00		
52	6.80	1,656,027	1,656,027	0.589%	0.681%		IND TRM Page 22	$ 40.00		
53	0.00	0	0	0.000%	0.000%		IND TRM Page 22	$ 5.00		
54	998	156,441,074	148,094,294	100%	100%					
55										

	O	P	Q	R	S	T	U	V	W	X
57	Net Total Demand (kW)	Gross Lifetime Savings (kWh)	Net Lifetime Savings (kWh)		% of Products Gross Annual Savings (kWh)			Incremental Cost from MEMD		
58	0.00	258947	134652	retail cost up to a	2.06%		IND TRM Page 155	$ 18.46		
59	0.00	670898	348867	retail cost up to a	5.34%		IND TRM Page 155	$ 18.46		
60	8.00	377898	196507	$ 200	2.51%		IND TRM Page 99-100	$ 304.61		
61	4.00	213543	111042	$ 300	1.42%		IND TRM Page 99-100	$ 456.91		
62	9.00	605397	314806	$ 400	4.01%		IND TRM Page 99-100	$ 609.21		
63	2.00	144179	74973	$ 500	0.96%		IND TRM Page 99-100	$ 761.51		
64	0.00	183847	95600	$ 100	1.22%		IND TRM Page 99-100	$ 703.91		
65	1.00	292873	152294	$ 200	1.94%		IND TRM Page 99-100	$ 703.91		
66	1.00	358255	186293	$ 250	2.38%		IND TRM Page 99-100	$ 703.91		
67	0.00	123231	64080	$ 300	0.82%		IND TRM Page 99-100	$ 703.91		
68	0.00	624656	324821	$ 300	4.14%		IND TRM Page 99-100	$ 703.91		
69	1.00	1891070	983357	$ 400	12.54%		IND TRM Page 99-100	$ 703.91		
70	1.00	1956453	1017355	$ 500	12.97%		IND TRM Page 99-100	$ 703.91		
71	0.00	655963	341101	$ 550	4.35%		IND TRM Page 99-100	$ 703.91		
72	59.00	770612	400718	$ 200	5.11%		IND TRM Page 87-90	$ 184.25		
73	5.00	1099500	571740	$ 150	13.12%		IND TRM Page 106-107	$ 280.00		
74	0.00	0	0		0.00%		IND TRM Page 108-109	$ 1,489.00		
75	10.00	1364080	709322	$400 / unit	16.28%		IND TRM Page 108-109	$ 1,489.00		
76	0.00	0	0		0.00%		IND TRM Page 108-109	$ 1,489.00		
77	3.00	39086	20325	$50 / unit	0.47%		IND TRM Page 146	$ 579.00		
78	7.00	93806	48779	$50 / unit	1.12%		IND TRM Page 146	$ 579.00		
79	12.00	156343	81298	$50 / unit	1.87%		IND TRM Page 146	$ 579.00		
80	0.00	26903	13989	$25 / unit	0.32%		IND TRM Page 56	$ 86.00		
81	0.00	0	0	$25 / unit	0.00%		IND TRM Page 56	$ 86.00		
82	5.00	426000	221520	$25 / unit	5.08%		IND TRM Page 76	$ 50.00		
83	0.00	0	0	$25 / unit	0.00%		IND TRM Page 76	$ 50.00		
84										
85	128	12,333,540	6,413,439							
87	1,126	168,774,614	154,507,733					$ 2,822,533.23		

Exhibit NM-14

ACEEE, Review of Performance Incentives, June 2015

Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency

Seth Nowak, Brendon Baatz, Annie Gilleo, Martin Kushler, Maggie Molina, and Dan York

Contents

About the Authors

Seth Nowak conducts analysis and writes reports on energy efficiency programs and policies in the electric and natural gas utility sector. Focus areas of his research include exemplary programs, best practices, and program evaluation, measurement, and verification. He joined ACEEE in 2010.

Brendon Baatz joined ACEEE in the fall of 2014. Brendon's research focuses on state energy efficiency policy, utility regulation, energy markets, utility resource planning, and utility-sector efficiency programs. Prior to joining ACEEE, Brendon worked for the Federal Energy Regulatory Commission, Maryland Public Service Commission, and Indiana Office of Utility Consumer Counselor.

Annie Gilleo joined ACEEE in 2013. She is the lead author for the *State Energy Efficiency Scorecard* and conducts research on energy efficiency resource standards and other state-level policies.

Martin Kushler is a senior fellow at ACEEE, where he previously served as director of the utilities program for 10 years. He has conducted numerous widely acclaimed national studies of utility-sector energy efficiency policies and programs and provided technical assistance to help advance energy efficiency policies in many states. He has been directing research and evaluation regarding energy efficiency and utilities for three decades, has been widely published, and has provided consultation to numerous states and the federal government. Prior to joining ACEEE in 1998, he directed the evaluation section at the Michigan Public Service Commission for 10 years.

Maggie Molina directs the Utilities, State, and Local Policy program at ACEEE. She conducts energy efficiency program and policy research and analysis and provides technical assistance on energy efficiency policy and programs to a wide variety of audiences, including state and local policymakers, regulators, utilities, and efficiency program administrators. Since joining ACEEE in 2005, she has authored numerous reports on state policy and utility-sector energy efficiency topics, including the first editions of the State Energy Efficiency Scorecard, state-level energy efficiency potential studies, utility business models, the cost of saved energy, and next-generation efficiency programs.

Dan York has more than 20 years of experience in researching, analyzing, and implementing energy efficiency policies and programs. He is widely recognized for his work tracking and analyzing trends and emerging issues in utility-sector energy efficiency programs. His entire educational and professional experience has focused on energy efficiency and conservation as the foundations for a sustainable economy. He joined ACEEE in 2001.

Acknowledgments

Executive Summary

Performance incentives for gas and electric energy efficiency play an increasing role in the expansion of energy efficiency programs in the utility sector. These mechanisms address economic disincentives to energy efficiency traditionally faced by regulated utilities. Performance incentives provide financial rewards or earnings opportunities to program administrators, utilities, and shareholders in return for energy savings.

Incentive policies are ripe for examination as major shifts reshape the natural gas and electric utility industry and its regulation, and as efficiency performance incentive policies become more prevalent. This study accordingly updates and expands ACEEE's 2011 report, *Carrots for Utilities: Providing Financial Returns for Utility Investments for Energy Efficiency* (Hayes et al. 2011).

We asked states to submit qualitative information on energy efficiency performance incentives, as well as quantitative information on incentives in the two most recent program years. We analyzed data across all of these states, and also prepared several in-depth case studies. Our findings include the following:

- Twenty-seven states have now adopted incentives based on cost-effective achievement of energy savings targets, of which 25 are currently implementing them, and 2 states' implementation is pending. In 2011, there were 20.
- Fourteen states report having modified or fundamentally changed their incentive mechanisms in recent years.
- Regulated utilities and third-party administrators have achieved savings goals and earned incentive payments in all the states currently implementing incentive mechanisms for which we obtained complete data.
- States with performance incentives in place in 2013 budgeted $23.50 per capita on average for electric energy efficiency programs, 50% more than states with no incentive policy. We found positive correlation in 2011 as well.
- Interviewees indicated that performance incentives influence utility behavior and decision making regarding energy efficiency programs.

Based on our review, we identified four types of performance incentives:

1. *Shared net benefits incentives* provide utilities the opportunity to earn an amount equivalent to some portion of the benefits of a successful energy efficiency program. The amount is usually a percentage of the positive difference between program spending and the dollar valuation of energy savings achieved. (13 states)
2. *Energy savings-based incentives* reward utilities for achieving pre-established energy savings goals measured in kWh or therms. For example, if the utility energy efficiency programs save 100% of target, they are eligible for some particular amount of an incentive payment, often expressed as a percentage of total program spending or budget in a tiered structure. (6 states)
3. *Multifactor incentives* are those in which the calculation of performance incentive amounts include multiple metrics, not only energy savings or energy savings net benefits. For example, financial incentives may be tied to demand savings, job creation, or measures of customer service quality. (5 states)

4. *Rate of return incentives* allow utilities to earn a rate of return based on efficiency spending. This creates a correspondence between demand-side (energy efficiency) spending and supply-side (generation and transmission) investments. (1 state)

As it was in 2011, the trend continues to be for states to adopt mechanisms that incentivize cost-effective achievement of energy savings targets, and to encourage more comprehensive, longer-term performance criteria. The majority of new mechanisms adopted fall into the shared net benefits category. Among states that have modified their incentive mechanism policies, several have adjusted quantitative aspects. These include incremental changes to minimum savings levels and award amount percentages. Others have changed the type of mechanism altogether. The common intention of these changes is to enhance energy efficiency program performance by having the incentive mechanism do a better job of guiding utility and program administrator leadership to meet program goals.

The industry experts we interviewed generally agreed that performance incentives influence utility behavior and decision making regarding energy efficiency programs. Their views are in close alignment with ACEEE's 2011 findings that the ability to assign a dollar value to efficiency investments significantly contributes to utility management's commitment to pursuing energy efficiency.

Since multiple economic and policy factors influence the performance of energy efficiency programs, it can be challenging to isolate and measure the specific impacts of performance incentive mechanisms. This report shows how mechanisms have been effective in various contexts by including twelve case studies providing background, policy details, and performance results on state experience with performance incentives. We conclude that performance incentives are working in combination with other supportive regulatory policies to encourage effective energy efficiency program performance.

Introduction

Utility business models and their regulatory environment are in the midst of historic change. Performance incentives for energy efficiency are part of this change in a growing number of states. These important regulatory tools give financial rewards or earnings opportunities to program administrators, utility companies, and their shareholders for meeting energy efficiency goals.

Utility investments in energy efficiency have greatly increased since the mid-2000s. Whereas utilities invested slightly less than $1.5 billion in energy efficiency programs in 2004, investments had jumped to $7.7 billion per year by 2014 (Gilleo et al. 2014). A number of policy drivers and other factors spurred this investment. Consumers wanted to reduce their utility bills, utilities were being asked to find more economical ways to meet rising demand, and states were looking for cleaner options to meet the energy needs of businesses and residents. Investments in energy efficiency can also create jobs, put more control into the hands of consumers when it comes to how and when they use energy, and help utilities build better relationships with customers.

This increased push to include energy efficiency in utility portfolios did not happen in a vacuum. Many states have adopted regulatory mechanisms to encourage utilities to establish long-term energy efficiency programs. Replacing regulatory practices that impeded the use of energy efficiency as a resource, these new mechanisms have played a crucial role in the expansion of customer energy efficiency programs.

BACKGROUND FOR THIS RESEARCH

Effective regulatory business models are increasingly important as energy savings from utility program portfolios continue to grow. Under traditional business models, cost-effective energy savings involved negative financial impacts and lost opportunities. Now states are increasingly trying to remove the disincentive for utilities to invest in efficiency. As this report will discuss, performance incentive policies have been one of their most effective tools.

This study builds on prior ACEEE research reported in *Carrots for Utilities: Providing Financial Returns for Utility Investments for Energy Efficiency* (Hayes et al. 2011). Since the publication of that report, states providing incentives have gained more experience with them, several new states and utilities have implemented incentives, and many have refined incentive structures already in place. This new report is an updated look at performance incentive mechanisms in states that have implemented or enacted them. We set out to find answers to the following questions:

- What types of performance incentives are being used, and how many states are implementing each type?
- How much money is being invested in each type of mechanism, and how does this compare to total utility energy efficiency budgets and spending?
- Do they work? Do knowledgeable experts at commissions and in the field see the incentives influencing utility behavior?
- What elements should be considered in designing energy efficiency performance incentives in various circumstances?

1

In answering these questions, we describe incentive structures, report recent data on the dollar amounts awarded, and examine outcomes and lessons learned.[1] We also summarize the insights of regulatory staff and other stakeholders into how performance incentives motivate utilities and other program administrators to institute high-performing energy efficiency programs.

UTILITY ECONOMIC DISINCENTIVES REGARDING CUSTOMER ENERGY EFFICIENCY PROGRAMS

The objective of reducing sales through customer energy efficiency measures is in conflict with the traditional US utility business model. Under this model, regulators set revenue requirements for a utility by aggregating all of its costs of providing service. They then calculate the rates necessary to recover that amount plus some acceptable return to the utility. As noted by the Regulatory Assistance Project (RAP 2011), regulators traditionally rely on two formulas:

$$Revenue\ requirement = Expenses + Return + Taxes$$
$$Rate = Revenue\ requirement / Units\ sold$$

In the first formula, "Expenses" refers to items such as fuel costs, operations, and maintenance. For the purposes of this explanation, "Return" may be thought of as the utility's profit. The utility is allowed to earn a set rate of return on its capital investments in assets including pipelines, electric generation facilities, and transmission lines.

The traditional business model linking cost recovery to volumetric sales of energy gives utilities the incentive to sell more electricity or gas, which increases revenues and associated profits. Rates are determined by a test year. If the utility can subsequently sell more units of energy than were used to calculate its rate in the test year, it can earn more than its revenue requirement.

This model has worked well for decades to meet its primary goal: to attract the enormous amount of capital needed to build the transmission, distribution, and generation infrastructure for a vast and growing system. Today, however, the model is being challenged by new realities such as slow or no growth in sales, competition from nonutility players, changing business models, and larger roles for energy efficiency and distributed generation (Nadel and Herndon 2014).

The traditional regulatory approach involves a number of disincentives to utility investment in energy efficiency (York et al. 2013). First, the costs of efficiency programs constitute financial losses to utilities unless they can recover those costs through rates or fees. Second, these programs drive down energy use and so reduce utility revenues without lowering the short-term fixed costs of providing service. This goes counter to utilities' incentive to sell more energy and earn more profits — often called the throughput incentive. Third, utilities normally realize a return on their investment when they fund capital assets like power

---

[1] Some state energy efficiency programs are run by third-party administrators, which we sometimes refer to as utilities. We also call Washington, DC a state for simplicity.

plants. Although efficiency programs reduce the need for this capital spending, they do not provide a comparable return.

REGULATORY APPROACHES TO ADDRESSING DISINCENTIVES

While there are clear disincentives for utilities to invest in energy efficiency under the traditional business model, there are strategies to address these disincentives as a means of encouraging more energy efficiency. Many states have adopted some or all of the following adjustments to the utility regulatory structure, thanks in part to a diverse set of stakeholders who can all agree that energy efficiency presents opportunities to both utilities and the public.

Program cost recovery allows utilities to recover the cost of energy efficiency programs through rates. It is widely accepted and not controversial. Typically, regulators allow utilities to treat efficiency program costs as expenses and to recover them through rate increases. Investments in energy efficiency program are also sometimes capitalized rather than treated as expenses. If capitalized, then the utility may raise rates to earn a return on the funds it invested in efficiency.

Finding a solution to the throughput incentive is a more complicated task. The most straightforward solution is *decoupling*.[2] Decoupling breaks the link between the amount of energy a utility sells and the revenue it can collect (RAP 2011). Rates are adjusted upward or downward as actual sales come in below or above forecast. Thus the utility is able to recover its investment and operating costs independent of actual electricity or gas sales. Conversely, the utility cannot exceed its revenue requirement no matter how much energy it sells. Its revenue is decoupled from the amount of energy its customers use.

Decoupling is in place in 24 states for electric or natural gas utilities or both (Morgan 2012). Three states have electric-only decoupling, 11 states only gas, and there are 10 states with decoupling for both (Gilleo et al. 2014). We count a state as having decoupling if at least one electric or gas utility is decoupled.

As an alternative to decoupling, many states have opted to address the throughput incentive with a slightly different regulatory tool — a *lost revenue adjustment mechanism (LRAM)*. Unlike decoupling, an LRAM does not completely break the link between a utility's sales and its revenues. Instead, an LRAM allows a utility to recover revenues that were reduced, not just due to any cause, but specifically as a result of energy efficiency programs.

There are two other distinctions between decoupling and LRAM. First, LRAM requires a calculation of energy efficiency program energy savings over a given period of time.[3] Decoupling does not require this calculation; it simply compares the volume of total sales to forecasted levels. Second, unlike decoupling, LRAM is generally not symmetrical. As

---

[2] Decoupling is recommended by ACEEE and numerous industry, nonprofit, and policy groups including the Natural Resources Defense Council, Regulatory Assistance Project, American Gas Association, and others.

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

discussed above, decoupling can result in either refunds or surcharges, depending on whether actual sales are above or below forecast. With LRAM, a utility can recover lost revenues from efficiency programs (under the rationale that it is under-collecting revenues due to reduced sales). However rates are not adjusted downward if the utility experiences a higher volume of sales than predicted in the rate case forecast.[4] LRAM is addressed in detail in a companion report to this one, *Review of Lost Revenue Adjustment Mechanisms* (Gilleo et al. 2015).

While decoupling potentially removes the disincentive to pursue energy efficiency, utilities with only decoupling in place still lack a positive incentive for efficiency, something that utilities and their investors would prefer to have as well.[5] Decoupling may provide a financial benefit to utilities by reducing the risk that efficiency efforts will lower utility returns, and it may make utilities modestly safer investments and more secure borrowers. However benefits are less direct than the ones offered by the traditional model of selling electricity or natural gas for a guaranteed rate. For this reason, utilities, regulators, and other stakeholders have looked for a more direct way to incentivize efficiency investments. Performance incentives can provide that way.

Performance incentives, the subject of this report, offer a utility financial rewards for saving energy through efficiency programs. Incentives allow the utility's energy efficiency activity to be a source of earnings rather than just a pass-through expense. This puts energy efficiency investments on the same footing as other types of utility investments (e.g., in new power plants or transmission and distribution) that are allowed to earn a rate of return. Incentives help compensate the utility for the earnings opportunities it forgoes when it does not have to invest as much in its supply infrastructure because of reduced demand.

PERFORMANCE INCENTIVES

Four Ways to Calculate Incentives

While energy efficiency performance incentive mechanisms vary from state to state, they fall into four general categories of ways to calculate incentives: 1) as a share of net benefits, 2) energy savings-based incentives, 3) multifactor, and 4) rate of return.[6] Virtually all of these performance incentive mechanisms have a threshold level set as the achievement of a minimum amount of energy savings. Some incentive policies may fall under more than one category. Each incentive calculation type is described below.

Shared net benefits. Shared net benefits mechanisms provide utilities the opportunity to earn some portion of the benefits of a successful energy efficiency program that otherwise would all go to the ratepayers. The incentive payment amount is usually a percentage of the positive difference between the costs (efficiency program spending) and the benefits (the

---

[4] Some states do have requirements in place meant to prevent utilities from over-earning under an LRAM.

[5] Decoupling approaches vary from state to state, and sometimes differ by utility in the same state. For more information, see RAP 2011. The relationship between a utility's cost of capital and the rate of return allowed by regulators is a determining factor concerning whether the disincentive for efficiency has been effectively removed or not. Also see Kihm 2009.

[6] There are many ways to categorize incentive mechanisms. See also the similar but not identical categorization in Cappers et al. 2009.

dollar valuation of energy savings achieved as a result the program). This category has a savings-based element, in that most of them have a threshold level set as the achievement of a minimum percentage of the energy savings performance goal for the utility. We call it shared net benefits because the incentive amounts are driven by net benefits; the greater the net benefits, the higher the incentive payment amount.

Energy savings-based. Savings-based incentives reward utilities for achieving, and sometimes for exceeding, pre-established energy savings goals, measured in kWh or therms. Often, these energy savings targets for utilities may be tied to or derived from statewide energy efficiency resource standard (EERS) policies. For example, if the utility energy efficiency programs save 100% of target, they are eligible for some particular amount of an incentive payment. Five of the six states with savings-based incentives have EERS. The amount of the financial incentive the utility earns is often calculated as a percentage of total program spending or budget in a tiered structure (e.g., achieve 100% of the savings target, receive an amount equivalent to 6% of the program spending; achieve 110% and receive 8%; and so on), but driven by the program energy savings achieved.

Multifactor mechanisms are those in which the calculation of performance incentive amounts are more complex and include multiple metrics. Energy savings are just one of several metrics that are used to determine the amount of incentive earned. This type of approach is found in a handful of states where the mechanism is used to forward the achievement of several regulatory and public policy goals at the same time. For example, financial incentives may be tied to demand savings, job creation, or measures of customer service quality.

Rate of return incentives are a fourth approach and are far less common. Rate of return incentives allow utilities to earn a rate of return based on efficiency spending. This creates a correspondence between demand-side (energy efficiency) spending and supply-side (generation and transmission) investments. For example, a utility may earn a rate of return for efficiency investments equivalent to or comparable to the rate it earns for new energy supply capacity investments.[7]

The Special Case of Non-Utility Program Administrators

An additional special category of performance incentives applies to situations where states have non-utility program administrators for their utility ratepayer-funded energy efficiency programs. These companies are contracted third parties that administer and implement energy efficiency program portfolios. Many of the concerns about utility earnings opportunities do not apply in these circumstances. As a class, the contract administrators in these cases differ from investor-owned utilities in their organizational and financial structures and the regulatory and policy frameworks in which they operate.[8] Examples include Efficiency Vermont, Wisconsin Focus on Energy, and Hawaii Energy. The common

---

[7] Amortizing the recovery by the utility of the cost of programs over multiple years may also be considered a rate of return incentive in some instances, if the utility earns a return on the balance after the first year.

[8] Municipal utilities, a third category of energy efficiency program administrator in addition to investor-owned utilities and third-party administrators, will be the topic of upcoming ACEEE research.

element for the purposes of this study is the desire to incentivize good performance by whoever is administering the programs. Third-party administrators have argued that performance incentives motivate excellence and maximize savings and cost-effective performance.

Therefore we have included non-utility program administrators along with the investor-owned utilities in our discussion of the four ways of calculating incentives. As it turns out, all of the currently operating independent administrators that have incentive mechanisms also have multifactor performance incentives. However the structures and calculation methods of the incentive mechanisms vary substantially from state to state. We discuss the details later in this report.

Methodology

We sent research questionnaires to public utility commission staff in each state that our records indicated had implemented performance incentive policies or where policies were pending. We only reached out to states for which our previous research had identified energy efficiency performance incentives.[9] Commission staff were asked to submit both qualitative and quantitative data on the incentive structures in place for electric utilities, gas utilities, or both. In total, we emailed questionnaires to 43 individuals, almost all of whom are public service commission staff members, in 29 states. We found that in some states performance incentives were no longer in effect or had not yet been implemented. In those cases, we did not make any further attempts to include them in our analysis or discussion in this report.

The questionnaires requested qualitative and quantitative data. We asked respondents about the nature and structure of the performance incentive mechanism or mechanisms in their state, and requested them to provide citations and documentation. The quantitative data we asked for (on two utilities, for two program years, for up to two mechanisms) was the incentive amount, total energy efficiency program costs (spending or budget), and energy savings achieved in kWh or therms. See Appendix B for a copy of the questionnaire.

In instances where we did not obtain a completed research questionnaire, we collected some of the data through phone interviews, regulatory filings, or other documents. Some of our state contacts returned the questionnaire but indicated that at least some of the data we had requested was unavailable or unclear. In particular, some states did not have the numbers ready for recent program years due to the length of their regulatory processes. For example, procedures for estimating energy savings or conducting evaluation, measurement, and verification of those results, and then having finalizing the amounts of the performance incentive, may take years in some cases.

---

[9] Our previous research includes Hayes et al. 2011 and Gilleo et al. 2014. It is possible that we missed additional states with utility incentives policies in those projects, in particular if they use a rate of return approach to amortize program costs and may not have categorized it as a performance incentive. For a recent listing of performance incentive policies by state, see IEI 2014.

Next we identified states representing a diversity of types of incentive mechanisms for additional research, making an effort to include those states leading the nation with the most extensive or exemplary energy efficiency portfolios and policies, states with geographic diversity, and a diversity of program-administrator types. For these, we conducted more extensive phone interviews with our contacts to get a deeper understanding of how the incentives function in practice, how they were intended to work in those states, and lessons learned. We then chose a group of these states to examine more closely for case studies. Case studies of Arizona, Arkansas, California, Indiana, Massachusetts, Michigan, Minnesota, Missouri, Oklahoma, Rhode Island, Texas, and Vermont are in Appendix A. The last steps in the data-gathering process were telephone interviews with other key stakeholders in this smaller subset of states, including utility representatives, consumer counsels, and advocates, and follow-up documentary research for the case studies.

Results

Our research identified 27 states with performance incentives for electric energy efficiency and 16 for natural gas energy efficiency. All states with incentives for gas efficiency also have incentives for electric efficiency. A few state respondents indicated that their states have performance incentives established for all regulated utilities. In other cases incentives for energy efficiency only apply to a subset of utilities in the state. Many energy efficiency performance incentives have been in place for a decade or more; most have been revised or reformed via legislation or new regulation in a series of iterations. Mississippi and West Virginia have not implemented their mechanisms yet.

Figure 1 shows the primary incentive mechanism type by state.
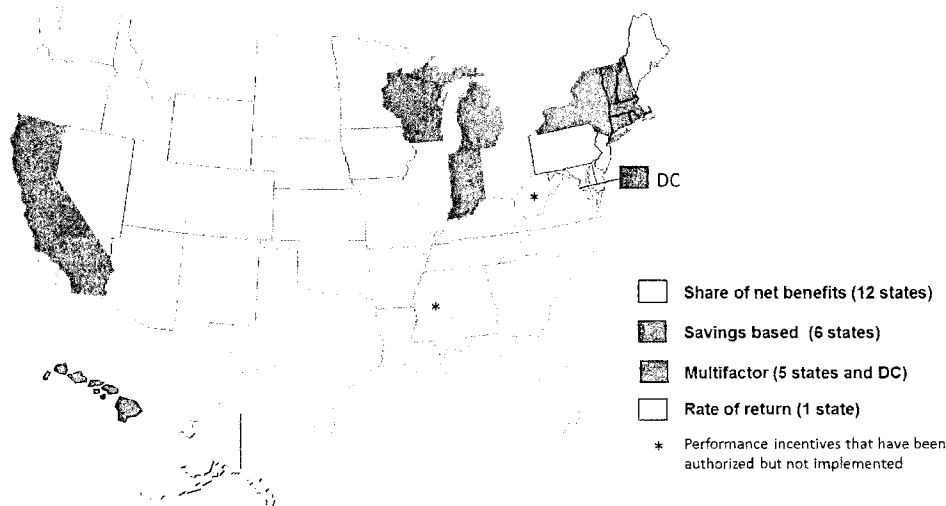
Figure 1. Primary incentive mechanism type by state. Incentive may apply to one or more regulated utilities, or to a statewide program implementer. Individual state information on performance incentives for electric and natural gas energy efficiency may be found on the ACEEE state energy efficiency policy database at http://aceee.org/sector/state-policy.

Shared net benefits energy efficiency performance incentives are the most common, seen in 13 states. We count Massachusetts in this group, although until the end of 2014 the calculation of incentives included additional performance indicators. Energy savings-based

incentives are the second-most prevalent mechanism type, with six states employing this approach. Washington, DC and four states use multifactor approaches. One state, New Mexico, pays a rate-of-return incentive on energy efficiency program investments paid by the utilities.

Of the 16 states with both gas and electric energy efficiency performance incentives available, none indicated that there are significant differences between the incentive mechanisms as applied to electric versus gas utilities.

Performance Incentives: Historical Background

The historical origins of performance incentives and their rationales vary from state to state. While there are some common themes, the regulatory, policy, and economic circumstances differ enough to defy generalization, as seen in these examples.

Massachusetts' first incentives were for New England Electric in the early 1990s. The state lowered the level of performance incentives and introduced decoupling during the mid-1990s. The primary motivation for having performance incentives has been to achieve energy savings goals. The ability of the utilities to earn a return on energy efficiency spending persuades them to align their goals with public policy goals.

Since the 1980s California had decoupling in place. However, in an effort to move toward deregulation during the late 1990s, California suspended decoupling. After the 2001 electricity crisis occurred, the state then reinstated decoupling over the next three years and moved to expand energy efficiency. In 2005, the California Public Utilities Commission added performance incentives in the form of the Risk Reward Incentive Mechanism to encourage greater efficiency. Unlike many states, the regulations at that time also included financial penalties if program performance results were not sufficiently in line with energy savings goals.

Oklahoma's utility performance incentives arose from an investor-owned utility approaching the Corporation Commission in a rate case, resulting in a commission order requiring the development of quick-start energy efficiency programs. The utility came back with a proposal including programs, a rider for cost recovery, lost revenue recovery, and a 25% shared-savings performance incentive mechanism. When it came time for full compliance programs, i.e., no longer only quick-start, the utilities were still allowed to seek lost revenues attributable to energy efficiency through an LRAM. The incentive was reduced from 25% to 15%. Oklahoma has decoupling for gas, but not electric utilities.

In Rhode Island, energy efficiency programs and utility performance incentives were both instituted years prior to decoupling. Performance incentives for energy efficiency were viewed at that time as one factor that allowed the utilities to support least-cost procurement.

Vermont's statewide energy efficiency utility, Efficiency Vermont, has had quantitative performance indicators to determine the financial incentives since 2000. Vermont Energy Investment Corporation (VEIC) was hired explicitly on a performance-based three-year contract basis, so having incentives was a logical element. In 2011 VEIC was engaged as an efficiency utility via a long-term order of appointment, but the performance incentive continued.

DESCRIPTIVE RESULTS

While the circumstances in which energy efficiency performance incentive mechanisms arose vary considerably from state to state, there are common aspects to how the mechanisms themselves are structured. Almost all have a threshold, or minimum percentage of an energy savings goal, which the utility must exceed in order to be eligible for earning any incentive. Similarly, almost all incentive mechanisms have a cap, or maximum limit, on the amount. Some caps are absolute dollar amounts, such as in those states that budget a set pool of funds from which incentives may be awarded. Other caps are

relative, expressed as a maximum percentage of program budgets or percentage of total net benefits. A third near-universal characteristic is that they all provide greater rewards for additional energy savings up to the level of the maximum incentive.

The following three tables summarize three aspects of the mechanisms: threshold, structure, and cap. The first table provides information on states with shared net benefits incentives, the second is for savings-based incentives, and the third is for multifactor incentives. Some of these state policies have elements of more than one type of incentive. In those cases, we list the state in the category with which it shares the main characteristics.

Reading the Tables

Threshold requirements. The left-hand column shows threshold requirements, i.e., minimum requirements for the incentive to be awarded. These are most frequently expressed as a minimum energy-savings performance measure that must be met for the utility or program administrator to be eligible, or potentially eligible, for financial incentives. For energy savings as a percentage of the utility goal or target, the minimum ranges from 50% to 100% of goal for those that have a minimum.

Overall incentive structure. The center column, overall incentive structure, briefly summarizes distinguishing elements of the incentive mechanism basis or calculation.

Cap or maximum incentive. The right-hand column, the cap or maximum incentive, indicates if there is a limit on how much a utility or administrator may earn for extraordinary energy efficiency program portfolio performance, and if so, how the limit is described or determined. Some of the caps are statewide or for all regulated utilities rather than on a by-utility basis. For example, a statewide pool of funds may be allocated to utilities based on their relative performance to each other, or their performance may be independently considered against a predetermined energy savings goal.

Shared Net Benefits

As shown in table 1, the most common thresholds for shared net benefits mechanisms are in the range of 70–85% of energy savings targets. Typically the amount of the incentive itself is calculated as percentage of the net benefits of energy savings achieved. The types of caps vary.

Table 1. Shared net benefits utility performance mechanisms overview: threshold, structure, and cap

State	Threshold requirements	Overall incentive structure	Cap or max incentive
AR	80% of net energy savings target	10% of net benefits with cap	Range from 4% to 8% program budgets
AZ	85% of gross savings goal	For 2013, 6–8 % of net benefits; capped based on percent of program costs. For 2014, $0.0125 per kWh saved.	$0.0125 per first-year kWh saved starting in 2014
CO	80% of net energy savings goal	1% net benefits for 80% of savings goals, 5% at 100%. 1% more for each 5% to max 15% at 150%. $5 million pretax disincentive offset for > 100% of electric savings goals; $3.2 million if 80-99%.	$30 million max performance incentive and disincentive offset
GA	50% of projected net energy savings	8.5% NPV actual net benefits of verified kWh savings. If annual incremental kWh savings is less than 50% of projected, will be 0.5% for demand response (DR) measures and 3% for energy efficiency (EE) measures.	No cap
KY	None	From 10% to 15% of net benefits for EE programs, excluding public education and pilot programs.	No cap
MN	Energy savings = lesser of 0.4% of retail sales or 50% of last five years' average gross savings	As energy savings levels increase to 1.5% of retail sales, utilities receive an increasing share of net benefits, up to an incentive level of and average of 7 cents per first year kWh saved. Varies by cost effectiveness of implemented projects.	Average incentive may not exceed $0.0875/first-year kWh saved or $6.875/MCF, nor exceed 20% of net benefits
MO	70% of approved three-year net savings target	Tiered or graduated scale, ranging from 70% to 130% of cumulative three-year savings target. Specifics vary by utility. For example, achieving 70% of savings goal pays 4.6% of net benefits, up to 6.19% for 130% or more, for Ameren Missouri. Others similar.	Percentage shared net benefits capped per utility; no cap on dollar amount
NC		Data not available	
OH		Data not available	
OK	2015 will be pass cost-effectiveness test and 80% of net goal savings	15% of net benefits	Previously no cap; in 2015 the cap will be 15% of net benefit
SC	Programs as a whole must pass the UCT	(6% SCE&G; 11.5% DEC) * [(net kWh and kW savings over measure life * avoided costs) – program costs] Amortized over five years for SCE&G	No cap
TX	100% of gross savings goal	1% of the net benefits for every 2% that the demand reduction goal has been exceeded	Max of 10% of a utility's total net benefits

Source: Public utility commission staff responses to questionnaires

Savings-Based

For savings-based mechanisms, shown in table 2, all the threshold requirements include achieving a minimum percentage of energy savings goals. The most frequent method of calculating incentive amounts is a tiered percentage of energy efficiency spending that increases as energy savings performance does relative to savings targets. Caps are also typically calculated as a percentage of energy efficiency spending.

Table 2. Savings-based utility performance mechanisms overview: threshold, structure, and cap

State	Threshold requirements	Overall incentive structure	Cap or max incentive
CT[1]	75% of net savings goals for 2014; for 2015, threshold is 80%	In 2014, 2% of program spending at 75% of saving goals. At 135% or more of a goal, max is 8% of program spending. Awarded on a scale. 80% of savings goals earns 2.5%.	8% of program costs
IN	60% or 65% annual gross kWh savings target achieved	IPL, Vectren, and Duke have tiered structures tied to program costs. I&M has a shared savings mechanism. Structure ties level of kWh achieved relative to set target to a percentage of program costs that the utility may receive as performance incentive.	15% of program costs
MI[2]	Utility System Resource Cost Test (USRCT) of 1.25 and minimum 100% target savings	Sliding-scale incentive awarded when net savings exceed 100% of target, starting at 5% of spending; varies by utility. Highest rate of incentive for savings performance is 10%.	Lesser of 25% of net benefits or 15% of program costs
NH	Benefit-cost ratio of 1.0 and 55% of plan savings. Apply separately to residential and commercial and industrial sectors.	Electric utilities: 7.5% at and above 55% total lifetime energy savings; 6.0% applies below 55% total lifetime energy savings. Natural gas utilities: baseline incentive of 8%.	Electric: max 10% at 55% savings and up; 8% under 55%. 5% cap each on kWh and cost effectiveness components. Gas: 12% of costs
RI	75% of target net savings	Target incentive is 5% of spending budget.	Max incentive 6.25% of approved spending budget

State	Threshold requirements	Overall incentive structure	Cap or max incentive
NY[3]	80% of the utility's net savings goal	Linear increase from 80% to 100% of each utility's share of statewide total. Step 1 incentive: 90% of maximum possible award if utility achieves 100% of its savings goal. Step 2 incentive: remaining 10% share of statewide maximum as bonus if statewide savings goal achieved.	100% of utility share of statewide $50 million pool for gas and electric over four years based on percentage savings goals

[1] One respondent in Connecticut summarized its performance incentive mechanism type as rate of return, although many of its features are of the savings-based type. [2] Michigan performance incentives for energy efficiency vary by utility and may reward multiple performance outcomes including minimum numbers of low-income customers served, demand savings, and participation in certain multi-measure programs. While predominantly saving-based, they might also be reasonably grouped with multifactor incentives. [3] New York has expressed the maximum amount of the incentive pool both as a percentage of total program costs and in terms number of basis points of the return on equity of an investor-owned utility. *Source:* Public utility commission staff responses to questionnaires.

Multifactor

The multifactor mechanisms are more varied from state to state, as shown in table 3. Where the energy efficiency programs are run by third-party administrators, the performance incentives accrue to those companies, not the electric and gas utilities.

Table 3. Multifactor performance mechanisms overview: threshold, structure, and cap

State	Threshold requirements	Overall incentive structure	Cap or max incentive
CA	No minimum level of energy savings specified in the CPUC order. Incentive amounts are a linear function of net lifecycle savings in kWh, MW, and MMTherms multiplied by an earnings rate coefficient.	Energy savings performance award, 9% of resource program budget (minus codes and standards [C&S]) used to determine lifecycle savings coefficients; ex ante review performance award, 3% of budget times Engineering Compliance Score; C&S program management fee, 12% of C&S program budget spending; non-resource program management fee, 3% of non-resource program budget spending.	Now: up to percentages listed for each area. Was: risk/reward incentive mechanism, capped at $150 million/year for all IOUs.
DC	Reduce per-capita energy use, add renewable generating capacity, reduce peak electricity demand growth, improve low-income housing EE, reduce largest energy users' energy demand growth, add green jobs	Contractor gets 25% of at-risk compensation allocated per benchmark for electricity consumption reduction = 0.5% annual reduction in 2009 weather-normalized electricity consumption in DC. Each 0.25% beyond initial 0.5% contractor gets additional 12.5% of incentive allocated to this benchmark.	Maximum at-risk compensation in Year 1 of $300,000, increasing up to $800,000 in program years four through seven
HI	75% of target for each indicator, including first-year kWh savings, peak demand reduction, total resource benefit, inter-island equity, and others	The contract administrator proposes targets for each indicator (e.g., XX GWH in energy savings). Each target includes 75% minimum and 125% maximum achievement amount. Financial incentives are based on percentages allocated to each indicator.	Yes. Incentive amount is flat $700,000; may earn extra $133,000 for performance 25% above target.

13

State	Threshold requirements	Overall incentive structure	Cap or max incentive
MA *	Statewide threshold 76.72% of savings goal; adjustments for each program administrator.	Statewide incentive pool allocated to: (1) 56% savings mechanism, (2) 35% value mechanism, (3) 9% performance metrics; set payout rates for savings and value components, incentive thresholds, and caps	125% of incentive amount related to the achievement of target savings for each utility.
VT	Efficiency Vermont (EVT) has a number of quantifiable performance indicators (QPIs). Each has a different threshold. Some are minimums, where EVT loses some fraction of incentive if it fails to reach threshold. Others scale down, with no minimum.	EVT has QPIs. Some are minimums that result in reductions to EVT's compensation if not met. Others scale up with increased performance. Incentive structure was based on prior three-year performance period. QPIs for 2015–2017 period include performance indicators (PIs) and minimum performance requirements (MPRs).	For 2015–2017, cap is 4.5% of implementation budgets. Of that, split is 40% operations fee, 60% incentives. For some QPIs, cap varies by indicator.
WI	Based on annual gross life-cycle energy savings and demand reduction of 6 million MWh, 288,000 thousand therms, and 83.77 MW.	Set amounts (not sliding scale) available for performance more than 120% of annual savings goal and for customer service measures; includes penalties for under-achievement on all metrics.	$750,000 total maximum for the four-year period

* Current Massachusetts regulation has removed the 9% for performance metrics, meaning that the performance incentive mechanism going forward may no longer be best categorized as multifactor incentive. The description here applies to the mechanism as it was in 2014. *Source:* Public utility commission staff responses to questionnaires.

The diversity of incentive mechanism structures and methods of calculation in the multifactor incentive group reflects both the intended performance outcomes (i.e., those components in addition to cost-effective energy savings) and the types of organizations (i.e., not only utilities). See examples of multifactor incentives in table 4.

Table 4. Multifactor performance incentives components and type of program administrator by state

State	Administrator or program name	Multifactor mechanism components (abbreviated list, illustrative only)	Administrator organization type
DC	DC Sustainable Energy Utility	Contract includes benchmarks for per-capita energy consumption, renewable energy generating capacity, growth of peak electricity demand, energy efficiency of low-income housing, growth of the energy demand of DC's largest energy users; and the number of green-collar jobs	Third-party administrator: nonprofit energy services organization
HI	Hawaii Energy Efficiency Program	Energy savings, net benefit, demand reduction, island, and other factors	Third-party administrator: for-profit private contractor

State	Administrator or program name	Multifactor mechanism components (abbreviated list, illustrative only)	Administrator organization type
MA *	Regulated utilities	56% savings mechanism (total benefits), 35% value (net benefits) mechanism, and 9% to performance metrics. Metrics include number of correct installations, market penetration, and others.	For-profit investor-owned utilities
WI	Wisconsin Focus on Energy	Annual gross energy savings targets. Key performance indicators (KPIs), customer satisfaction measured versus baseline and days incentives outstanding (a measure of how quickly participants get financial incentive payments).	Third-party administrator: For-profit private contractor

* Current Massachusetts regulation has removed the 9% for performance metrics, meaning that the performance incentive mechanism going forward may no longer be best categorized as multifactor incentive. The description here applies to the mechanism as it was in 2014. *Source:* Public utility commission staff responses to questionnaires.

Rate of Return

We do not include a table displaying rate-of-return incentives, because New Mexico is the only state we surveyed to have a rate-of-return mechanism in place. We define rate-of-return mechanisms as those that provide a financial return on energy efficiency spending without tying the financial award directly to energy savings.[10] This is in marked contrast to other states that pay incentives for energy efficiency portfolio performance, whether as measured by energy savings, the net benefits of energy savings, or those metrics combined with additional quantified performance outcomes, as is the case with multifactor incentive mechanisms.

There is no minimum energy savings threshold for New Mexico's regulated investor-owned electric and gas utilities to be eligible for the financial incentive. However there is an indirect performance threshold because program spending is budgeted to be 3% of utility retail sales, evaluated programs must meet cost-effectiveness criteria, and there is a statewide energy efficiency resource standard. By stipulation, regulators have established an annual incentive for calendar years 2014–2016 that is equal to 7% of program expenditures; both efficiency spending and incentives are budgeted by utility and then trued up annually. Utilities must demonstrate that the energy efficiency programs they propose to the New Mexico Public Regulation Commission are cost effective using the total resource cost test (TRC) and the utility cost test (UCT).

---

[10] Kentucky statute also allows the commission to approve a financial return on efficiency spending; in practice, they have used a shared net benefits approach. Amortizing the recovery of the cost of programs over multiple years may also be considered a rate of return incentive in cases in which the utility earns a return on the balance after the first year. This is the case in Maryland. Vermont Gas Systems (VGS) receives a return on approved energy efficiency spending and their recovery of energy efficiency costs is amortized over three years. This was not considered to be a performance incentive by those we spoke with in Vermont.

COMPARATIVE RESULTS

To provide a quantifiable basis for analysis of these types of incentives, we examined incentive amounts relative to energy efficiency program costs. We recognize that there are many differences among jurisdictions in terms of policies and performance. Comparing ratios of incentive amounts to program costs is still a useful and straightforward means of comparison. Note that the following data are not normalized by the extent to which energy savings goals were achieved or exceeded, nor are these organized into tiers by the absolute levels of energy-efficiency spending or savings.

To make these comparisons, we collected data on the dollar amounts of performance incentive financial awards by utility for the two most recent program years or program cycles for which these amounts were readily available. Most states submitted data for the largest one or two regulated investor-owned utilities, as we had requested. In most cases these were electric utilities. As one means of normalizing the data across states, we calculated the ratio of incentive amount to energy efficiency program cost by utility or program administrator. For energy efficiency cost, we used either total annual program spending or budget, as provided by regulatory staff contacts.

Next we sorted the utilities into groups by type of incentive mechanism employed in their respective states applicable to the reported utilities. This provided us with data for the ratio of performance incentive amounts to annual energy efficiency costs. For years in which both data points were available, there were 24 instances of shared net benefits, 14 of utilities with savings-based incentives, 12 of administrators or utilities with multifactor incentives, and 1 rate of return mechanism, for a total of 51 data points. These data are presented as reported by respondents and therefore may vary in their methods of calculation across states. Our aim is to provide a relative basis for comparison and contrast, not to claim a definitive measure.

In figure 2, the gray boxes indicate the inter-quartile range of data around the median. The vertical lines indicate the full range from the lowest to highest.

Incentive amounts relative to annual costs by mechanism type
(n = 51)
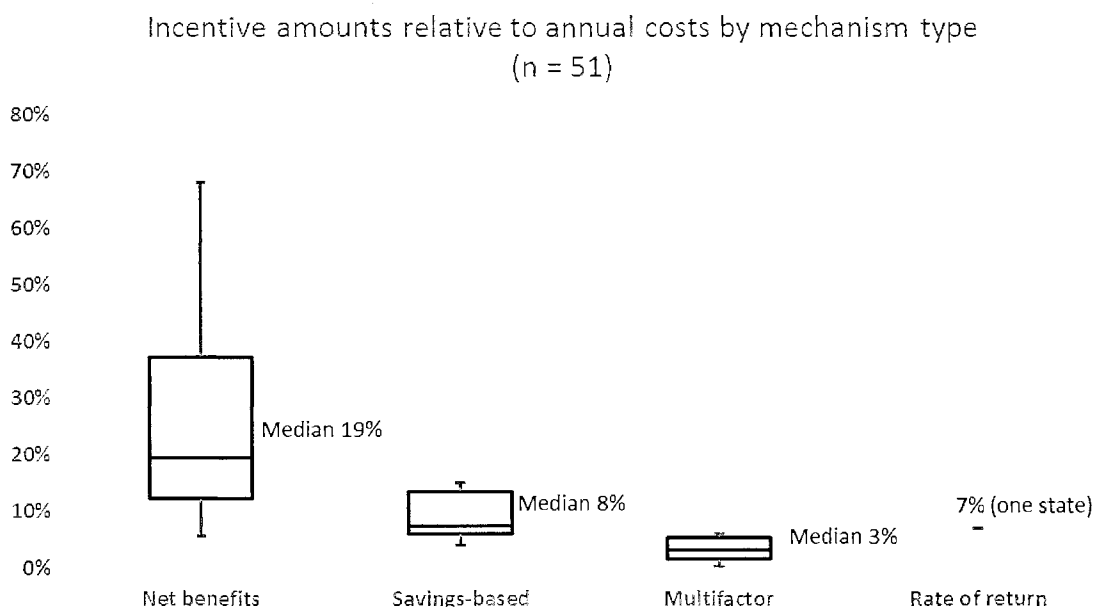
Figure 2. Incentive amounts relative to total annual energy efficiency costs by mechanism type. *Source:* Derived from public utility commission staff responses to questionnaires.

Shared Net Benefits

The eight states reporting performance incentives based on the net benefits provided by energy efficiency pay out, on average, the highest financial awards relative to annual costs. Often, the benefits are calculated over the full measure life and not just for one year. This means the incentive is front-loaded.[11] This may be one reason net benefit incentive amounts are often higher than is the case with other approaches. They are still generally lower than earnings on supply-side investments over the life of those investments, realized in net present value.[12] Of the 24 ratios reported here, the highest is 68%, the lowest is 6%, and the median is 19%. This is significantly higher than the ratios in states using other approaches to calculating incentives. Only 7 of the 26 award amounts reported from states using multifactor or energy savings-based incentive calculation methods were 8% of energy efficiency program costs or higher. The highest ratios in the data set in the chart are from 2011 and 2012 for two Minnesota electric utilities and are not representative of incentive amounts for the majority of shared net benefits mechanisms. These utilities had neither LRAM nor decoupling mechanisms in place during those years, which may partially explain the higher ratios. For further discussion, see the Minnesota case study in Appendix A.

---

[11] States have a variety of approaches to how they calculate net benefits and how many years constitute the measure lives. Often measure lives are determined in a technical reference manual (TRM).

[12] See https://www.pge.com/regulation/EnergyEfficiencyRisk-RewardIncentiveMechanismOIR/Pleadings/NRDC/2010/EnergyEfficiencyRisk-RewardIncentiveMechanismOIR_Plea_NRDC_20101206_203020.pdf.

Savings-Based

The savings-based award-to-cost ratios are generally in the middle of the dataset in terms of incentives as percentage of spending, though substantially below net benefits, as seen in figure 2. Of the 14 energy savings-based award amounts included here, relative to energy efficiency costs, the ratios ranged from a low of 4.2% to a high of 15%, with a median of 8%. As defined above, savings-based incentives reward utilities for achieving pre-established energy savings goals, measured in kWh or therms. These may be tied to or derived from statewide energy efficiency resource standards (EERS). For utilities that over-comply with energy savings goals, i.e., achieve more than 100% of their targets, the maximum incentive dollar amounts impose an upper limit on how much energy savings beyond target is eligible as well, since the two are tied together.

While the amount of the financial incentive the utility may be eligible for is generally expressed as a percent of total program spending or budget in a tiered structure or a proportionate scale, we have chosen not to describe these as spending-based incentives, since eligibility is based on savings, not spending. Also, the term "savings-based" distinguishes them from those we are calling rate-of-return incentives.

Multifactor

Multifactor incentive amounts are the lowest when compared per dollar of costs budgeted or spent on efficiency programs. The median for multifactor awards is 3% as a percentage of energy efficiency spending. The highest multifactor ratio is 6.5%. The lowest ratio included here is approximately two-tenths of 1%, for Wisconsin Focus on Energy, a third-party administered portfolio. This ratio is derived from the highest incentive payout possible to the contract administrator under the contract; the actual amount for the first four-year period has yet to be calculated and paid out and is contingent on both energy savings and customer service metrics.

Most multifactor energy efficiency performance incentives are for third-party administrators. This subcategory of multifactor incentives has the lowest awards as a percentage of program costs. The incentives they receive or may be eligible for, for meeting and exceeding energy savings goals, average just 1.8%, ranging from 0.2% up to 3.5%.

Performance incentives for non-utility program administrators generally are structured and perform differently than those for utilities. This is not surprising because third-party administrators are different economic entities than investor-owned utilities. For example, they do not have the revenue-loss disincentive that utilities face with regard to customer energy efficiency. Also, program administrators that are private firms typically would already have some profit margin built into their contract for services, and a performance incentive may simply be a bonus on top of that. These factors could justify a lower performance incentive percentage than might be received by a utility. Conditions and factors that influence setting incentive levels are reviewed in the Discussion section below.

Rate of Return

Since the New Mexico incentive mechanism is relatively new, we do not have data on amounts that will be paid out. However, since it is not dependent on performance outcomes

18

in the same manner as other states, we can predict that the payments will be 7% of actual energy efficiency spending for all the eligible regulated utilities.

In the Commission Order on case 12-00317-UT, *Final Order Partially Adopting Recommended Decision*, the commission determined the following:

> The financial incentive provided by the EUEA [Efficient Use of Energy Act] is the opportunity for a utility "to earn a profit on cost-effective energy efficiency and load management resource development that, with satisfactory program performance, is financially more attractive to the utility than developing supply-side utility resources." NMSA 1978, § 62-17-5(F) (PNM 2013)

With supply-side generation as the frame of reference, the design and description of the rate-of-return incentive follows naturally. The payment of the incentive to the utility may even be included in base rates similar to investments in supply-side resources. The commission states it plainly, citing and repeating state statute verbatim: "This incentive on energy efficiency resources — also referred to as 'demand-side resources' — may be recovered through an approved tariff rider or in base rates, or by a combination of the two."[13]

Some other states permit utilities to capitalize energy efficiency program costs. The difference is that New Mexico gives utilities the choice to recover incentive dollars through base rates, and that those fund amounts derive from spending, not energy savings. In contrast, Michigan utilities, for example, are allowed to request that energy efficiency program costs be capitalized and earn a normal rate of return, but while they may request a performance incentive for shareholders, it is only if the utilities exceed their annual energy savings targets.

HOW ARE PERFORMANCE INCENTIVES WORKING COMPARED TO FOUR YEARS AGO?

ACEEE's research in 2011 shared three key findings in the areas of state policy, utility performance, and expert opinions on the influence of incentives on utility behavior:

1. The states profiled in the report showed a strong preference for designing policy mechanisms that award incentives based on cost-effective achievement of energy savings targets, rather than other metrics such as program spending levels.
2. Where those targets had been established, utilities consistently met or exceeded target savings levels.
3. Industry experts interviewed agreed that shareholder incentives influence utility behavior and decision making. The report noted some of the industry stakeholder observations in that regard. (Hayes et al. 2011)

---

13 "A public utility that undertakes cost-effective energy efficiency and load management programs shall have the option of recovering its prudent and reasonable costs along with commission-approved incentives for demand-side resources and load management programs ... through an approved tariff rider or in base rates, or by a combination of the two." NMSA 1978, § 62-17-6(A) (2008) (PNM 2013)

The report also charted the energy efficiency spending per capita for the average of the 18 profiled states, which all had performance incentive mechanisms in effect. That average was plotted relative to other states for four years, 2006 to 2009. As presented in table 5, states with incentives invested more per capita in energy efficiency than states with other policies (such as LRAM or decoupling) and more than those with no supportive regulatory policy. These results do not isolate the impact of other important policy drivers such as EERS. Later in this section we provide additional comparative analysis on states with and without performance incentives on energy efficiency impacts.

Table 5. Average per capita investment in energy efficiency programs by state, 2009 and 2013

2009 utility efficiency spending per capita		2013 electric energy efficiency program spending per capita	
Profiled states with energy efficiency performance incentives in effect (n =18)[1]	$15	States with electric energy efficiency performance incentives in effect (n=25)	$23.5
Policies other[2]	$8	States with no incentive policy (all other states)	$15.3
No mechanisms[3]	$5		

[1] Eighteen states identified in 2011 as having shareholder incentive mechanisms for IOUs active prior to 2009. Many of these states have additional mechanisms in place to align incentives such as decoupling or lost revenue recovery mechanisms. [2] These are the states that have made some effort to align utility incentives to encourage efficiency, excluding the profiled states. This group roughly approximates states that have only adopted decoupling or lost revenue recovery mechanisms for either gas or electric utilities. [3] These are the states that have been identified as having adopted no mechanisms for properly aligning incentives to encourage efficiency.

Developments since 2011 include the following:

- More states have adopted incentives based on cost-effective achievement of energy savings targets, and several have modified or fundamentally changed their mechanisms.
- Regulated utilities and third-party administrators have achieved savings goals and earned incentive payments in all states with incentive mechanisms for which we have current data.
- Industry experts continue to find that performance incentives influence utility behavior and decision making.[14]

Policy Design Trends

Over the past four years, performance incentive mechanisms have been spreading to more states. The trend continues to be for states to adopt mechanisms that incentivize cost-effective achievement of energy savings targets, and to encourage more comprehensive performance criteria. For example, five of the eight states that have authorized performance incentives in the past four years chose either multifactor mechanisms or shared net benefits.

[14] See York et al. 2013 for additional recent examples.

ACEEE's 2011 study found 18 states that had shareholder incentive mechanisms available to investor-owned utilities for at least a full year for which there was information available regarding performance results for the incentives in the field (Hayes et al. 2011). Today, there are 21 states meeting all of those criteria (including determination of incentive amounts and verification of energy savings). There are now 25 states with incentive policies in some phase of implementation and a total of 27 states with at least one authorized incentive mechanism for gas or electric utility energy efficiency.

Relatively recent states to have authorized performance incentives are shown in table 6.

Table 6. States authorizing new performance incentive mechanisms

Type of incentive	State	Year authorized or effective
Multifactor	DC	2011 authorized
Shared net benefits	Arkansas	2010 ordered
	Missouri	2013 effective
	North Carolina	2013 authorized
	South Carolina	2010 authorized
Rate of return	New Mexico	2013 effective
Savings-based	Indiana	2009 12 by utility
	New York	2011 authorized

Three states profiled in 2011, which had incentive mechanisms for individual utilities at that time, no longer have performance incentives in place. Washington had a pilot for Puget Sound Energy, Idaho had a savings-based pilot for Idaho Power,[15] and Nevada had a rate-of-return incentive for NV Energy. Puget Sound Energy did not request a continuation when the pilot expired; since then, the Washington Utilities and Transportation Commission (UTC) issued a package of orders on three different Puget Sound Energy cases including decoupling and others. The Idaho Power pilot was ordered discontinued because of declining returns and energy impacts. The Nevada policy allowed for increased rates for efficiency investments in addition to cost recovery, calculated as the utility's authorized return on equity (ROE) plus 5% applied to the rate-based demand-side management (DSM) costs.

Mississippi and West Virginia have authorized incentives but not yet implemented them. Michigan and Vermont both had (and continue to have) performance incentive mechanisms in place but were not selected to be profiled in our previous report. For detailed information on Michigan and Vermont, please see the case studies in Appendix A.

---

[15] *Performance-Based Demand-Side Management Incentive Pilot 2007 Performance Update.* Filed with the Idaho Public Utilities Commission March 14, 2008.
http://www.puc.idaho.gov/internet/cases/elec/IPC/IPCE0632/company/20080317PB%20DSM%202007%20UPDATE.PDF

The majority of states that have incentive mechanisms have modified or fundamentally changed them over time. Fourteen states reported having authorized a new version more than a year after the initial incentives were established. A few examples in table 7 illustrate this evolution.

Table 7. Examples of evolving performance incentive mechanisms

State	Past practice	Today
Hawaii	Utility-administered programs	Third-party administrator
	Hawaiian Electric Company (HECO) eligible for earning incentives up to 5% of net benefits	Multifactor incentive mechanism for public benefits fee administrator (PBFA)
	Received as much $4 million some years, which was over 20% of total program spending	Average award 2% of total program spending
Massachusetts	From 2010 to 2012, increased percentage of incentive pool for energy savings, decreased for other metrics	Continuing increase in percentage of incentive pool for energy savings and decrease for other metrics
	Total incentives averaged 8% of program costs	Total incentives now approximately 5% of program costs
		In 2014, eliminated financial incentives for meeting quantitative performance indicators
Rhode Island	2004 increased electric threshold from 45% to 60%	2012 increased electric threshold from 60% to 75%
	Increased allowed incentive from 4.25% to 4.4% of eligible program costs	2012 increased allowed incentive to 5%
Texas	2008 electric utilities may earn 1% of net benefits for every 2% they exceed goal with cap 20% total program costs	2011 changed cap to 10% net benefits, greatly increasing potential incentive payments
Wisconsin	For one utility only, same rate of return was earned on efficiency investments as for capital projects	Multifactor incentive for third-party administrator

Increasing Evidence Shows Savings Goals Achieved Where There Are Incentives

ACEEE research findings published in *Energy Efficiency Resource Standards: A New Progress Report on State Experience* (Downs and Cui 2014) identified 18 states with both utility performance incentives and EERS in place. A central finding of the research was that overall, states with EERS were substantially achieving their energy savings goals. One of the lessons learned was that those states hitting their targets also generally had complementary policies in place that supported the utility business model to give the utilities stronger motivation to pursue energy efficiency. These included lost revenue adjustment mechanisms (LRAM), revenue decoupling, and performance incentives such as those examined in this report.

The data we collected strongly point to the conclusion that in those states where there are incentives, utilities in each of them are meeting at least the minimum performance

thresholds and earning substantial economic incentives. Of the 25 states with performance incentives being implemented, we obtained complete questionnaire responses for 21. Of those, 18 reported performance incentive amounts paid or to be paid for at least 1 utility in the most recent program period; 17 had at least 1 utility for the most recent 2 program years or cycles. The other three states are still in the midst of their processes—the Wisconsin and Missouri performance incentives, for example, are only calculated at the end of a multiyear cycle. Wisconsin just completed a cycle at the end of 2014, and Missouri will at the end of 2016.

COMPARING EFFICIENCY PERFORMANCE AMONG STATES WITH AND WITHOUT INCENTIVES

From a public policy standpoint, the fundamental purpose of a policy for energy efficiency performance incentives for utilities (or third-party administrators) is to facilitate greater energy efficiency effort and achievements. Data available from ACEEE's annual *State Energy Efficiency Scorecard* research allow us to examine whether having an energy efficiency performance incentive policy in place in a state is associated with greater energy efficiency accomplishments.

For this analysis we focused on two key indicator variables regarding electric energy efficiency performance: energy efficiency spending as a percentage of total revenues, and energy efficiency kWh savings as a percentage of retail sales. We examined the most recent year for which complete data are available, i.e., 2013. We compared states that had an energy efficiency performance incentive policy implemented in 2013 with states that had no energy efficiency incentive policy in place on these average statewide metrics. We also compared subgroups of states, including those with EERS policies and those without EERS policies.

It is important to acknowledge that many unique factors in a state or utility will influence utility behavior regarding energy efficiency programs. Therefore this analysis requires several caveats. First, the year of implementation of an efficiency incentive or EERS policy, for example, may be a significant driver of that state's 2013 efficiency commitments. That variable was not controlled in this analysis and therefore is a limitation. Second, we present statewide averages, whereas sometimes efficiency incentive policies may only be implemented for one major utility. Other unique factors across states include historical experience with efficiency policies, electricity prices, and avoided costs, all of which have an indirect impact on the level of efficiency that is deemed cost effective.

Despite these caveats, it is useful to look at how patterns of performance vary across many states under different policy conditions. The results of our analysis are presented in table 8.

Table 8. Energy efficiency spending and energy savings in states with and without electricity performance incentive policies

	Average 2013 electric EE spending as a percentage of utility revenue	Average 2013 electricity EE savings as a percentage of sales
States with EE performance incentive (n=25)	2.0%	0.9%
States without EE performance incentive (n=25)	1.4%	0.5%

We included states that had incentive policies implemented in 2013. We did not include Mississippi and West Virginia because policies are authorized but not yet implemented.

These results showed that states with incentive policies had somewhat higher spending as a percentage of revenues (2.0%) than states without incentive policies (1.4%); and substantially higher savings (0.9%) than states without incentives (0.5%).

These results are a useful comparison. However they are complicated by the fact that the presence or absence of an EERS policy is such a dominant factor in the level of energy efficiency achieved in a state.[16] We went on to control for that factor by restricting the comparison of incentives to no incentives just to EERS states, and then doing a similar analysis just in states without an EERS. There was virtually no difference between states with or without a performance incentive policy in either of those subgroups.[17]

While these findings are obviously not determinative for every state or utility, (e.g., California's savings dramatically increased following the restoration of incentives in the late 2000s) the results indicate that, in aggregate, having an energy efficiency performance incentive policy appears to be at least somewhat associated with higher levels of energy efficiency effort (program spending) and achievement (energy savings) compared to states without an energy efficiency incentive policy.

Another approach to measuring the effectiveness of efficiency performance incentives is to compare an individual state's progress on efficiency over time after adoption of the policy. To account for the impact of an EERS policy, we could examine states with performance incentives but no EERS, which include Georgia, South Carolina, South Dakota, Kentucky, Missouri, New Hampshire, and Oklahoma. Two of these states, Missouri and Oklahoma, were included in case studies and therefore are good candidates for further examination. For more information and details on Missouri and Oklahoma, see Appendix A.

---

[16] See the ACEEE Blog post "IRP vs. EERS: There's one clear winner among state energy efficiency policies." December 16, 2014. http://aceee.org/blog/2014/12/irp-vs-eers-there%E2%80%99s-one-clear-winner-.

[17] By comparison, the EERS subgroup of states combined had three times the level of relative savings (savings as a percentage of sales) as the non-EERS subgroup of states, suggesting a very strong relationship between having an EERS policy and higher levels of energy efficiency spending and savings.

24

Prior to adoption of an incentive policy, one of Missouri's electric utilities, Ameren Missouri, had a portfolio of customer programs totaling about $70 million over a three-year period (2009–2011). A stipulation and agreement, among Ameren Missouri and parties to its 2012 efficiency plan (2013–2015) application, was approved by the commission in 2012. This agreement included both an incentive and LRAM policy. Ameren Missouri then launched a full portfolio of energy efficiency programs totaling $145 million over the three-year program period, more than twice the levels of the prior three-year plan. 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 an incentive policy late in 2014. Once in place, KCP&L initiated a portfolio of energy efficiency programs totaling $28.6 million over 18 months; after that time the company is expected to file a full three-year plan. More recently, however, Ameren's proposed level of investment in energy efficiency program remains about the same as the existing three-year MEEIA program plan, but expected savings are about half.

In Oklahoma, the general consensus of stakeholders interviewed by ACEEE is that the incentive policy has been effective in encouraging utilities to achieve greater energy efficiency savings. Since the policy was adopted in 2008, statewide electric utility program energy savings have ramped up quickly from 0 to over 100,000 MWh per year. However some observed the utilities could be achieving much greater savings and would be doing so if the state had an energy efficiency resource standard. Others expressed concern that without the incentive policy in place, it is unlikely the utilities would offer any programs at all. Forthcoming changes will modify several aspects of gas and electric utility efficiency rules, which may have an impact on efficiency savings. For example, beginning in 2015, utilities will only be allowed to collect an incentive if the portfolio achieves 80% or more of the individual utility's goal and the portfolio has a TRC score higher than 1.0.

These state examples provide further evidence that efficiency performance incentive policies have been helpful in making the business case for utilities to invest in efficiency. They also demonstrate some key challenges when the policies are not coupled with specific energy efficiency target requirements. The Ameren example demonstrates large swings in savings from one program cycle to the next. It appears the incentive and LRAM alone were not sufficient to lead Ameren to increase its efficiency savings levels. The structure of the incentive may help by making sure its threshold aligns with a higher percentage of savings. In general, however, without clear and steady policy guidance from the commission through specific targets, energy efficiency as a cost-effective utility resource is vulnerable to large swings in commitments.

From our overall experience, we speculate that an important but less quantifiable effect of a performance incentive policy may be in influencing utility management to cooperate with state policies to require energy efficiency programs (such as an EERS) rather than to seek to block their enactment or challenge them in legal proceedings. If that is the case, that would also be an important function for a performance incentive policy.[18]

---

[18] Nearly three-quarters of states with an EERS policy also have a performance incentive policy in place.

To further refine this comparison among states with performance incentives for energy efficiency in the electric sector, we reviewed the 2013 *State Scorecard* budgets and energy savings data by type of incentive mechanism.

Table 9. Energy efficiency spending and energy savings in states with various types of incentive policy mechanisms

Type	Average 2013 electric EE spending as percentage of utility revenue	Average 2013 electricity EE savings as percentage of sales
Multifactor (CA, HI, MA, VT, WI)	3.4%	1.6%
Savings-based (CT, IN, MI, NH, NY, RI)	3.2%	1.2%
Share of net benefits (AR, AZ, CO, GA, KY, MN, MO, NC, OH, OK, SC, TX)	1.1%	0.6%
Share of net benefits with EERS or similar policy (AR, AZ, CO, MN, NC, OH, TX)	1.5%	0.8%
Share of net benefits, no EERS or similar policy (GA, KY, MO, OK, SC)	0.6%	0.4%

As shown in table 9, the average energy savings achieved as a percentage of energy sales for those states with performance incentive policies based on a share of net benefits approach are significantly lower than those for states with multifactor and savings-based mechanisms. The same basic difference is observed in terms of the relative level of energy efficiency program spending. This is not surprising, since one would expect the level of programs spending and the level of savings to be highly correlated.

Overall, the results suggest that the relative level of effort for energy efficiency appears to be lower in the group of states with a share of net benefits type of incentive mechanism. One possible explanation of the observed results would be that they may also be heavily influenced by the presence or absence, and the relative level, of EERS policies in the states in the various incentive category groups. As shown in the last two rows of table 9, the existence of an EERS policy continues to appear to be an important factor.

Of those states with shared net benefits performance incentives in place, seven of them have EERS and five do not. Those with EERS have twice the energy savings relative to sales, and more than double the electric energy efficiency budgets as a percentage of utility revenue than the states with no EERS or similar policy. In comparison, 10 of the 11 states listed in table 9 with multifactor and savings-based performance incentives also have EERS or similar policies in place, which may help account for the overall higher performance of those groups.

Discussion

Performance incentive mechanism design and implementation have evolved since ACEEE's 2011 report. The high quantitative correlation between energy efficiency budgets and the presence of performance incentive policies persists. However the correlation does not prove anything conclusive about cause and effect. There are too many factors and confounding variables, including differences across states, to isolate the specific effects of performance

incentive mechanisms on energy efficiency budgets and spending without significant additional analysis. Whether or not, and to what extent, it is the performance incentives driving utilities to expand programs and achieve greater cost-effective energy savings, is a research question that we discuss below and through the case studies in appendix A.

Incentives and Utility Behavior

ACEEE concluded in the 2011 report *Carrots for Utilities* that incentives influenced utility behavior, motivated utility management, and influenced energy efficiency planning. Specifically, we found the following:

> Utility industry regulators, staff, and stakeholders consistently indicated that shareholder incentives mechanisms implemented in the 18 Profiled States had influenced utility behavior. Respondents indicated that the ability to assign a dollar value to efficiency investments significantly contributed to "buy-in" by corporate management, making efficiency more appealing as an investment option and engaging senior management in efficiency planning and decision-making in a more significant way. Several utilities indicated that the incentive influenced planning at the utility, allowing treatment of efficiency as a long-term investment strategy (Hayes et al. 2011).

Similarly, in 2013, ACEEE published *Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation* (York et al. 2013). The report considered six utilities that provide large customer energy efficiency programs in states with decoupling or shareholder incentives in effect. The research assessed financial and program impacts as well as organizational and managerial impacts, finding that supportive regulatory mechanisms have been critical in elevating the role of energy efficiency.

To update and expand upon our earlier research, we explored current views on the influence of incentives on utility and program administrator behavior through interviews with regulatory staff, utility program representatives, and nonprofit and environmental group contacts. There is broad consensus among those we interviewed that incentives can have a strong and positive affect on utility program performance. The degree of influence depends on the type and amount of incentive mechanism and how its influence is enhanced or restrained by other regulation, regulatory process and timing, and state policies.

Some interviewees relayed very successful experiences in which performance incentives, and the overall incentive process, directly influenced utility behavior regarding energy efficiency program planning, administration, and even measureable energy savings performance results. This is particularly the case for four leading energy efficiency states in New England. Common among each of these are that they have decoupling or LRAM for both gas and electric, have had performance incentives established for 10 years or longer, and have extensive energy efficiency investment and program portfolios.

Connecticut. Connecticut interviewees saw a correlation between incentives and electric and natural gas savings, as well as a diversification of the source of energy savings, reducing the (narrow) focus on energy savings from efficient lighting. Contacts pointed out that Connecticut officials agreed that performance incentives influence investor-owned utility behavior in a positive way. In particular, the 75% minimum energy savings threshold was

not an impediment in any way, and in fact, utilities were "always shooting for the moon" in terms of hitting their energy savings targets.

Massachusetts. Our contacts in Massachusetts noted in particular that the process of negotiating the most recent round of performance incentives was instrumental in gaining utility acceptance of increases to statewide annual energy saving requirements through the EERS. The EERS goals are among the highest in the nation and directly impact savings targets of individual utilities. A utility representative emphasized that the particular design of the incentives in Massachusetts plays a big role in how resources are allocated by utilities, including within energy efficiency portfolios. For a more thorough discussion, see the case study in appendix A.

Rhode Island. Everyone we spoke with regarding Rhode Island was unambiguous in their assessment that the incentives positively influenced utility behavior. National Grid, which serves most of the state, creates projections and program tracking in advance to make sure programs achieve 100% of their targets. The mechanism serves to focus utility attention on achieving their goals. When the incentive structure was changed in 2013 to raise the threshold of savings from 60% to 75% of the energy savings goal, and the slope of the increased incentive levels became much steeper, the utility responded. Now as it gets toward the end of the program year, it assesses savings compared to target and considers pushing to complete some projects that might otherwise lag into the next period. It stays aware of its pipeline of upcoming projects to see if it can work with vendors and distributors to acquire energy savings in those programs and measures where there is strong demand. It also aims for the internal flexibility to move budget money around to promote popular projects, measures, and technologies.

An observer outside of National Grid Rhode Island said the incentives influenced the utility in a very positive way, and described their dedicated program staff as "passionate, innovative, do a good job, and have a program to be proud of. With the implementation of decoupling, it made the utility even more willing to promote energy efficiency." These favorable comments describe the last two years since the changes have been made to the incentive mechanism. Prior to that, those interviewed said the utility had not been on a path to achieving savings goals and had undergone a restructuring and changes to middle management. Subsequent to the changes, they have not had problems achieving savings goals and now regularly achieve more than 100%. For more details, see the Rhode Island case study in Appendix A.

Vermont. Vermont experts we interviewed had consistent views on how performance incentives influenced and sometimes directly guided actions of the program administration contractor, Vermont Energy Investment Corporation (VEIC). VEIC runs the "energy efficiency utility" Efficiency Vermont. One expert observed that "they take seriously and respond strongly to the details of the [performance incentive mechanism] design. They . . . reallocate resources where the incentive structure directs them." In fact, the 2015–2017 period includes more challenging targets on many metrics, because almost all the time in the past all the goals had been met or exceeded, leading to the possible interpretation that "either it is working or the goals were too easy." For a more thorough discussion, see the case study in Appendix A.

New England states are not the only examples of incentives influencing utility behavior. Michigan presents a performance incentives success story from the Midwest. Its incentive mechanism was one of several regulations set forth in 2008 in accordance with the state's energy efficiency standard to support its full implementation. The commission has modified the incentive mechanism to incentivize comprehensiveness in addition to a short-term focus on first-year savings. The incentive attracted utility management support for energy efficiency programs and clearly played a key part in the state's overall performance success: every year since inception of the EERS, Michigan has exceeded energy savings goals.

In other states, those we interviewed had generally positive things to say, along with some caveats, and identified areas for improvement where incentives could be made more effective. In Arizona, incentives were viewed as impacting utility behavior, at least in terms of utility personnel effort. Regulatory staff were reluctant to comment on the overall effect on utility performance, relative to other factors (e.g., the general inclination to want to please the commission.) Other observers said the presence of incentives clearly motivated utility program managers and staff to deliver better performance. It helps internally in the company to see their activity as something that can benefit the company financially.

In a few states, incentives were needed to persuade utilities to accept energy efficiency requirements in the first place, and their subsequent implementation has not been as fine-tuned or closely monitored by regulators as in other states. Oklahoma is an illustrative example. The state had no established energy efficiency programs to begin with, so incentives for efficiency came along with them as part of the package. One observer shared that without the incentives, "programs were nonstarters for the utilities," adding that there is a strong pro-business environment in Oklahoma and that "the incentive rules certainly kept energy efficiency going" there.

Importance of Regulatory Process

California has had performance incentives in place for multiple three-year program cycles, and there is widespread support for some form of incentive. However the implementation in reality has taken longer than originally planned to go through the regulatory processes. Viewpoints from those interviewed about California mechanisms varied quite a bit. Since 2008, incentive amounts have generally not been set out until after the efficiency programs have been implemented. The performance incentive mechanism applicable to the 2010–2012 program cycle was not established until 2012. One stakeholder said that the incentive levels for 2015 had not been laid out yet as of the end of 2014. The delays were due to the uncertainty shareholders had about whether or not the utility would get the incentive payments, and if so, how much and when. One respondent stated that "Wall Street does not see it as income." Another expert explained that all along there had been an expectation of incentives, and that did influence utility behavior and cooperation. The fact that factors related to the program evaluation process delayed the incentive decisions did not change that reality.

The experience of regulators and utilities in Missouri is another example that demonstrates the importance of the process, and in particular, of how impact evaluation plays into it. In Missouri the previous lack of an existing strong, consensus-based evaluation approach has led to a contentious process with different parties' evaluation experts providing differing

views on which methods and estimates to use. Policymakers and regulators need to establish such strong evaluation frameworks and protocols that are integrated with the performance incentive mechanisms. Both savings-based incentives and shared net benefits incentives amounts are a direct function of impact evaluations, and whether net, gross, or lifetime energy savings are the basis of the amount matters. Those results, therefore, are critically important for their accuracy and acceptance.

How Should an Incentive Mechanism Be Structured?

Considerations for the effective design of performance incentives include the specific intended functions and purposes of the mechanism as well as the economic, policy, and regulatory context. Incentives are one regulatory tool among several under which utilities do business. The presence or absence of decoupling, LRAM, and EERS can have an impact on the effectiveness of the incentive mechanism in influencing utility behavior and program outcomes. Organizational structures matter, too. Vertically integrated utilities, such as an electric utility that owns electric generating plants, have a different economic and capital expense profile relative to distribution-only electric utilities. A high level of avoided costs can lead to greater net benefits of savings, which in turn could result in higher financial incentive payments, with implications for how high the incentive rate should be and whether there should be an upper limit or ceiling.

One area of priority consideration for designing energy efficiency performance incentives is the core characteristics that make them successful. In a presentation at the 2013 ACEEE National Conference on Energy Efficiency as a Resource, Toben Galvin of Navigant Consulting built upon the objectives set forth by California Public Utilities Commission in its 2013 decision adopting the Energy Savings and Performance Incentive Mechanism, highlighting the following five characteristics:

- Clear performance goals representing a short set of the most critical objectives
- Clarity with respect to how performance will be measured
- A timely and transparent process defined for independent measurement and verification of performance results
- Incentive earnings opportunities sufficient to motivate IOU performance, while providing cost-effective value to ratepayers
- Incentive structure that rewards value and results, not just spending (Galvin 2013)

With both contextual factors and these objectives in mind, another policy design choice for states considering performance incentive mechanisms is what type of mechanism to use. There are pros and cons to each. Examples are presented in table 10.

30

Table 10. Strengths and weaknesses of various types of performance incentive mechanisms

Type	Strengths	Weaknesses
Shared net benefits	Go further to incentivize by multiplying the financial rewards to the utility for the overall maximization of cost-effective energy savings. Higher financial incentives relative to energy efficiency spending (may also be considered a negative aspect).	Administrator could possibly allocate excessive resources to programs or customer classes with the most cost-effective savings opportunities, which could lead to "cream skimming" or potentially significant inequities among customers. May not promote deeper savings, as those tend to be more expensive and hence have fewer net benefits. May be more uncertainty in the measurements used to determine the award, such as measurement of avoided costs.
Savings-based	Ties dollar incentive amounts directly to energy savings achieved. Rewards effective program performance.	Although all states with energy efficiency programs require some minimum level of cost effectiveness, it may be argued that this approach only encourages meeting the minimum, rather than maximizing cost effectiveness for the energy efficiency portfolios as a whole. May lead to disproportionate investment in programs and technologies with largest energy savings opportunities, such as lighting.
Multifactor	Integrates the incentive mechanism more fully with policy goals beyond the bounds of energy efficiency. Can serve to focus utility and administrator attention on specific, targeted objectives.	Mechanism and process may become complicated to plan, administer, and regulate.
Rate of return	Address the fundamental economic interest of the utility to pursue energy efficiency. Conceptually mimic the basic incentive structure that appears on the supply side. Since energy efficiency program plans generally require commission approval and at least some degree of oversight and reporting, if not stringent measurement and verification of energy savings, rate-of-return mechanisms still may be considered to some degree to be performance incentives, rather than shareholder incentives.	Unless they are carefully structured to require savings performance as an eligibility requirement, they essentially reward spending rather than actual savings performance. Do not provide the same direct and focused motivation to achieve particular performance objectives as much as other options.

For a comprehensive look at designing performance incentives to encourage utility energy efficiency programs, see Whited, Woolf, and Napoleon 2015.

Issues and Potential Solutions

States have used varying approaches to address and mitigate the negative aspects of the incentive types described in table 10. One issue that can arise for any type is excessive focus on short-term savings. This may arise if the incentives are tied to first-year savings results, which is a common metric for program evaluation. The problem is that energy efficiency measure lives vary considerably, but what we really want is persistent, long-term energy savings. Some states have successfully dealt with this by incentivizing lifetime savings rather than first-year, or by including both metrics in the calculation of the incentive amounts.

The misallocation problem noted above for shared net benefits approaches, or the all eggs in one basket issue, could be addressed by regulators through the use of carve outs, requiring savings to be distributed more evenly, and by having a maximum incentive pool or amount for each subset (such as customer groups, geographic regions, or program sectors). Several incentive mechanism policies include elements that require or provide for additional incentive dollars for addressing these concerns. For example, Hawaii rewards inter-island equity. Michigan has potential financial incentives for multi-measure residential and multi-measure commercial and industrial sector performance.

A key concern for policymakers to consider is incentive amount. Incentive levels need to be high enough to motivate utility top management and address the basic economic elements of the regulatory business model, but not so high as to appear too rich and engender political opposition. States with demonstrated performance incentive success with broad support have modified the basic structures — minimum savings threshold requirements, percent incentive amounts (the slope of the increase), and caps — over multiple program cycles in order to reach consensus on a balance of the various goals. Perception is important. When Texas changed the mechanism from 20% of program cost to 10% of net benefits, although the percentage was half as much, the actual payments almost doubled. Texas utilities have been meeting and exceeding both demand and energy savings goals every year since 2008, with only one exception for a single year of energy savings.

Other considerations depend on the type of program administrator. Different approaches may be most appropriate for investor-owned utility, third-party administrator, or nonprofit program administrators. Motivations differ by organization. Investor-owned utilities have multiple financial objectives to advance the overall business interests of the company, including profitability, stock price, managing risk, and their long-term corporate strategy. A third-party administrator is likely to have a narrower concern: the contract must be profitable and achieve a high level of performance that will lead to continuation of the contract. Nonprofit administrators are motivated by financial incentives as well, though in the context of fulfilling their mission rather than only for the money. The purposes and specific objectives of the incentive mechanism also vary. For IOUs, the most basic is to persuade management to legitimately pursue energy efficiency. For third-party administrators, the mechanism may be designed to focus administrator attention on implementing programs to satisfy key performance criteria.

32

When asked for any suggestions they would make to another state that was thinking of adopting a utility energy efficiency performance incentive such as the mechanisms used in their state, respondents shared the points listed below. A frequent theme was the recommendation to adopt an incentive mechanism that balances motivating utilities and program administrators to achieve energy savings goals with achieving cost effectiveness.

Comments from respondents included the following:

- Keep the mechanism simple while fairly aligning the interests of ratepayers and shareholders.
- Choose a shared-benefits-type incentive that rewards the utility both for achieving higher energy savings levels and for doing so cost effectively.
- Establish clear definitions and a standard that applies to all utilities equally. Standardize the reports, how the savings are calculated and adjusted, and what embedded costs are to be included. Failing to do so may cause confusion and results that vary according to the way they are interpreted.
- Be aware of the size of the incentive. In a structure where the incentive is a function of savings or spending, the total incentive can grow quickly as the energy efficiency budget increases. This is particularly true in the current environment where more and more emphasis is being placed on energy efficiency.
- Inform all parties of what the range of potential incentive levels might be so that no one is surprised. Use incentives to encourage utilities to expand their successes beyond the status quo.
- Consider the potential for interactive effects between programs and the potential for competing priorities when implementing multiple programs with different incentive mechanisms. (This recommendation may be most relevant for multifactor performance incentive mechanisms.)

Conclusions

Over the past four years, performance incentives for utilities and administrators of energy efficiency programs have been playing a vital and growing role in supporting the expansion of energy efficiency. These incentives are a critical component of the package of regulatory policies that address and often overcome disincentives utilities face as part of the traditional regulatory model. As energy efficiency programs multiply and expand in terms of dollars invested and energy savings achieved, more states have enacted and are implementing incentive mechanisms. The supportive regulatory policies go hand-in-glove with higher energy efficiency standards and statewide goals.

States continue to favor those mechanisms that drive program administrators toward the longest-lasting and most cost-effective energy savings performance. This is shown by the number of new states adopting various incentive approaches and by the modifications regulators have been making to existing incentives. Simply rewarding IOUs for spending money on basic energy efficiency programs is only a starting point. Regulators now are aiming for the wisest possible use of ratepayer dollars to achieve maximum net benefits while maintaining equity among customer groups.

Incentive mechanisms are working in combination with other regulatory policies to encourage energy efficiency program performance. Experts agree that performance incentives are needed and that they are effective in influencing utility behavior. In states where they are eligible for financial incentives, utilities meet and frequently exceed energy savings targets.

References

Cappers, P., C. Goldman, M. Chait, G. Edgar, J. Schlegel, and W. Shirley. 2009. *Financial Analysis of Incentive Mechanisms to Promote Energy Efficiency: Case Study of a Prototypical Southwest Utility.* March. LBNL-1598E. Berkeley, CA: Lawrence Berkeley National Laboratory.

Downs, A., and C. Cui. 2014. *Energy Efficiency Resource Standards: A New Progress Report on State Experience.* Washington, DC: American Council for an Energy-Efficient Economy. http://www.aceee.org/research-report/u1403.

Galvin, T., and B. Kim. 2013. "Show Me the Money: A Review of Recent Utility Energy Efficiency Performance Incentive Designs." Presentation at the 2013 ACEEE National Conference on Energy Efficiency as a Resource. September. http://aceee.org/conferences/2013/eer/program.

Gilleo, A., A. Chittum, K. Farley, M. Neubauer, S. Nowak, D. Ribeiro, and S. Vaidyanathan. 2014. *The 2014 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. http://www.aceee.org/research-report/u1408.

Gilleo, A., M. Kushler, M. Molina, and D. York. 2015. *Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms.* May. Report U1503. Washington, DC: ACEEE.

Gold, R. 2014. *Penalties in Utility Incentive Mechanisms: A Necessary "Stick" to Encourage Utility Energy Efficiency?* Goldman School of Public Policy, University of California, Berkeley Energy Policy Research Conference, Energy Efficiency Policy Performance and Consumer Preferences panel.

Hayes, S., S. Nadel, M. Kushler, and D. York. 2011. *Carrots for Utilities: Providing Financial Returns for Utility Investments in Energy Efficiency.* Washington, DC: ACEEE. http://www.aceee.org/research-report/u111.

IEI (Edison Foundation Institute for Electric Innovation). 2014. *State Electric Efficiency Regulatory Frameworks.* December. http://www.edisonfoundation.net/iei/Documents/IEI_stateEEpolicyupdate_1214.pdf.

Kihm, S. 2009. "When Revenue Decoupling Will Work . . . And When It Won't." *Electricity Journal* 22 (8): 19–28.

Morgan, P. 2012. *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs, and Observations.* Lake Oswego, OR: Graceful Systems LLC.

Nadel, S., and G. Herndon. 2014. *The Future of the Utility Industry and the Role of Energy Efficiency.* Washington, DC: ACEEE. http://www.aceee.org/research-report/u1404.

PNM. 2013. Final Order filed 11/6/2013 in Case No. 12-00317-UT for Public Service Co of New Mexico.

RAP (Regulatory Assistance Project). 2011. *Revenue Regulation and Decoupling: A Guide to Theory and Application.* June. Montpelier, VT: Regulatory Assistance Project. file:///C:/Users/snowak/Downloads/RAP_RevenueRegulationandDecoupling_2011_04.pdf.

Satchwell, A., Cappers, P. and Goldman, C. 2011. *Carrots and Sticks: A Comprehensive Business Model for the Successful Achievement of Energy Efficiency Resource Standards.* Berkeley, CA: Lawrence Berkeley National Laboratory. March. LBNL-4399E.

Whited, M., T. Woolf, and A. Napoleon. 2015. *Utility Performance Incentive Mechanisms: A Handbook for Regulators.* Synapse Energy Economics. http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf.

York, D., S. Kihm, M. Kushler, S. Hayes, S. Sienkowski, and C. Bell. 2013. *Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation.* Washington, DC: ACEEE. http://aceee.org/sites/default/files/publications/researchreports/u133.pdf.

Appendix A. Case Studies

ARIZONA

Background

Arizona's entry into the arena of large-scale utility energy efficiency programs is relatively recent, precipitated by orders from the Arizona Corporation Commission (ACC) in 2009 and 2010 that created a utility Energy Efficiency Standard (Docket No. RE-00000C-09-0427, Decision No. 71436 and Decision No. 71819). The commission ordered that by 2020, each investor-owned utility must achieve cumulative annual electricity savings of at least 22% of its retail electric sales in calendar year 2019 through cost-effective energy efficiency programs.

Although Arizona is most noteworthy for that Energy Efficiency Standard, the state has actually allowed utility incentives for energy efficiency programs since 2005. The first approach was adopted in a settlement agreement and was designed as an incentive based on a share of net benefits, with a cap equivalent to 10% of energy efficiency program spending. Later that was modified to a sliding scale cap on program spending (up to 16%). For 2014 that was modified to a flat amount per kWh saved. The structure and timing of these changes varied somewhat for the two major investor-owned electric utilities in Arizona (Arizona Public Service and Tucson Electric Power), which accounts for some of the differences observed in the outcomes table.

Incentive Policy Details

After the policy evolution described above, the current incentive policy for each of the two major utilities is very simple. Once a threshold of 85% of the energy efficiency savings goal is reached, the utility qualifies to receive a cash incentive of $0.0125/kWh times the first-year annual kWh saved. There is no cap on the amount of incentive that could be earned based on that incentive per kWh formula.

Other Relevant Regulatory Features

Arizona currently has an EERS requiring investor-owned electric utilities to achieve cumulative annual electricity savings of at least 22% of its retail electric sales by 2020. The state also requires natural gas utilities to obtain 6% cumulative savings by 2020. Lost revenue recovery mechanisms (LRAMs) were approved for both Arizona Public Service Company (APS) in 2012 and Tucson Electric Power Company (TEP) in 2013. Southwest Gas received authorization for full revenue decoupling in 2011.[19]

Energy Savings Outcomes

Figure A1 illustrates the increase in Arizona electric energy efficiency program savings.

---

[19] Analysis of Arizona Public Service data by Lawrence Berkeley National Lab considered the potential impacts of incentives combined with decoupling on utility ROE (Satchwell, Cappers, and Goldman 2011).
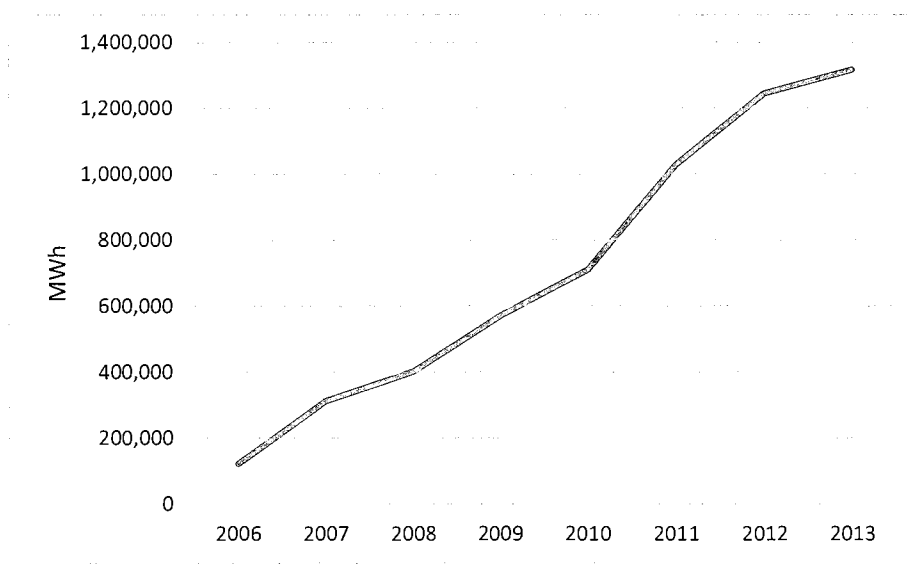
Figure A1. Arizona energy savings 2006-2013. *Source:* ACEEE *State Scorecard* 2007-2014.

Financial Outcomes

Table A1 shows 2012-2013 Arizona performance incentives and savings.

Table A1. Arizona performance incentives and savings 2012-2013

Company	Incentive	Program Cost	Total annual energy savings (MWh)	PI as percentage of program cost
		2013		
Arizona Public Service	$4,529,373	$50,962,754	485,791	8.89%
Tucson Electric Power	$1,879,095	$11,869,205	177,425	15.83%
		2012		
Arizona Public Service	$8,631,364	$61,652,601	551,639	14.00%
Tucson Electric Power	$559,737	$6,224,345	105,655	8.99%

Source: Arizona Corporate Commission

Discussion

The amounts of incentives earned for the most recent two years, under the evolving incentive mechanisms, have been within the mid-range to upper mid-range of typical incentives around the nation (i.e., incentive equivalent to approximately 9-16% of program spending). It is too soon to know how the results of the recently established mechanism ($0.0125/kWh) will compare to those figures.

In general, the basic concept of having some kind of financial incentive for the utility, tied to energy efficiency program performance, has not been particularly controversial. Disagreements have focused on the mechanism and the amounts, rather than the basic principle that the utility could earn an incentive. The most recent change (to move to a flat

$0.0125 per kWh saved) was made because there was some concern that the prior mechanism (capped at a percentage of program spending) might incent the utilities to spend more money than necessary. As noted above, it is too soon to know how the incentive amounts under the new mechanism will compare to the previous approach.

Evaluation

Energy efficiency programs are evaluated by contractors hired by the individual utilities. There is no public process or collaborative oversight of the evaluations, and the ACC does not hold a contested case review of the evaluation process or outcomes. Arizona uses gross savings as the metric for estimating lost revenues.

Looking Forward

There is a docket currently open (Docket No. E-00000XX-13-0214), under which the ACC has a draft proposal that would substantially change the existing utility Energy Efficiency Standard that the ACC created in 2009 and 2010. Depending upon the outcome of this docket, the approach to utility incentives could change. The draft proposal issued by the ACC would eliminate the policy that allows the current incentive mechanism and switch to an approach of allowing the utility to earn a rate of return on energy efficiency program expenditures.

ARKANSAS

Background

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 utilities filed Energy Efficiency Plans in July 2007 containing proposed Quick Start efficiency programs. The utility response was still relatively small, and they expressed concern about the adverse financial impact of customer energy efficiency on the utilities. In response, in 2010 the commission took several actions to increase the energy efficiency efforts.

In 2010, the APSC adopted an 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, rising from an annual reduction of 0.25% of total electric kWh sales in 2011, to 0.5% in 2012, and 0.75% in 2013. In 2013 the APSC extended the 0.75% target to 2014 and then set a target of 0.9% for 2015. The PSC deferred the 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 (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 issued an Order approving a general policy under which the commission outlined steps to approve incentives to reward achievement in the delivery of essential energy conservation services by investor-owned utilities (Order No. 15 Docket 08-137-U). Incentives were approved for all three gas utilities in the state and the two largest electric utilities in 2012 and 2013.

Incentive Policy Details

The APSC announced the general policy for utility performance incentives for energy efficiency achievements in December 2010. The basic mechanism approved is a share of net benefits approach. A utility must first meet 80% of the energy savings target for a given year to qualify for incentives. If the annual savings are between 80% and 100% of the target, the utility can receive an amount equivalent to 10% of the net benefits, capped at 5% of the program spending amount. For savings above 100% of target, the 10% of net benefits is capped at 7% of program spending. Any incentive awards are rolled into the single energy efficiency charge to customers, along with LRAM adjustments and program costs. There are no penalties, although the commission has reserved the right to issue penalties for nonperformance.

As with the LRAM mechanism, incentives are calculated based on net savings. One distinction is that under the LRAM policy, lost revenue compensation is done contemporaneously based on projected savings, and then trued up with evaluation, measurement, and verification (EM&V), whereas incentive awards are not approved until the EM&V documentation is in hand. The process involves the utility's filing an annual report, followed by a contested case process and then a commission order.

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 Arkansas Public Service Commission in three-year cycles. The three largest natural gas distribution companies in Arkansas are decoupled, while no electric companies are decoupled in Arkansas. Electric utilities in Arkansas are able to collect lost revenues associated with declining sales resulting from energy efficiency programs, as well as earn an incentive based on energy efficiency savings results. Note that the commission issued an order inviting electric utilities to file decoupling but none has done so.

Energy Savings Outcomes

Figure A2 illustrates the increase in Arkansas electric energy efficiency program savings.
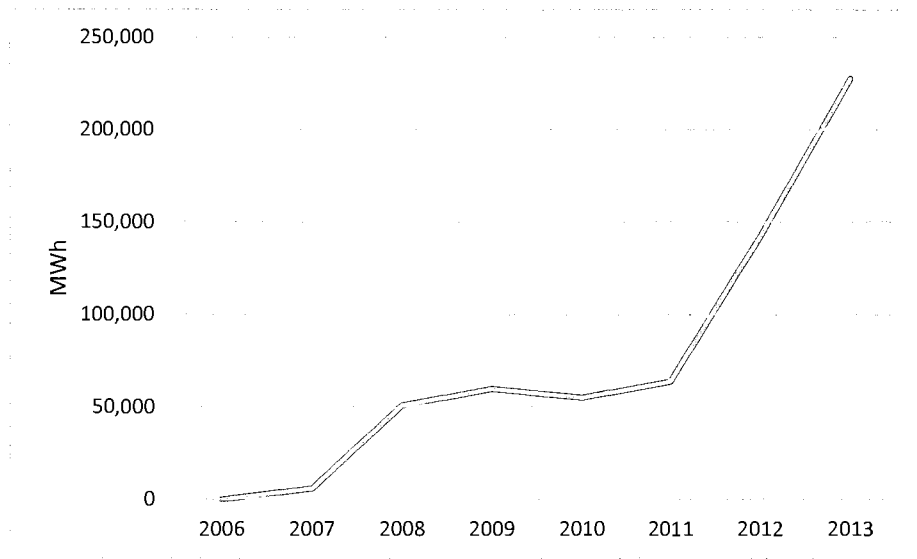
Figure A2. Arkansas energy efficiency program savings 2006-2013. *Source:* ACEEE *State Scorecard* 2007-2014.

Financial Outcomes

Table A2 shows 2012-2013 Arkansas performance incentives and savings.

Table A2. Arkansas electric utility performance incentives 2012-2013

Company	Incentive	Program cost	Total annual energy savings (MWh)	PI as percentage of program cost
2013				
Entergy Arkansas	$3,712,268	$52,285,262	188,468	7.10%
SWEPCo	$574,225	$6,803,249	25,387	8.44%
2012				
Entergy Arkansas	$1,743,700	$28,515,019	107,627	6.12%
SWEPCo	$413,131	$5,289,095	17,767	7.81%

Source: Arkansas Public Service Commission

Discussion

The major electric utilities in Arkansas have definitely ramped up their energy efficiency efforts and achievements in response to the various commission orders and policies that have been established since 2007. How much of that might be attributable to the incentive policy is difficult to say.

In aggregate, it does appear that the package of policies adopted in 2010 (i.e., EERS, LRAM, and performance incentives) have had a very notable effect. In the words of a commission staff person: "The commission took away every excuse, and the utilities have found it's not so bad." Whereas there has been some discomfort with the LRAM policy by the commission

41

and other parties, the concept of having a shareholder incentive tied to good performance has not been particularly controversial for most parties.

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, and to jointly fund an Independent EM&V Monitor that provides overall oversight and guidance, and operates under the direction of the commission staff. The commission established an EM&V collaborative called Parties Working Collaboratively (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

The incentive structure has been slightly modified to take effect for the next three-year planning cycle. Within a range of 80–120% of savings target, the 10% net benefits will be capped at a sliding scale of 4–8% of program spending. The new system will provide somewhat lower rewards for performance at the low end of the scale, and somewhat higher rewards for performance at the upper end of the scale.[20] Other aspects are expected to remain the same. Looking ahead in general, there will be substantial turnover of Commissioners during 2015, so there is understandably some uncertainty about future decisions.

CALIFORNIA

Background

California has had a long history with performance incentives for utility energy efficiency programs spanning three decades. We focus on the more recent history here that provides the most relevant context for the current issues.[21] Since 2006, there have been, broadly speaking, three main versions of incentives over this time period.

The first was the Risk Reward Incentive Mechanism (RRIM), which was in place for the energy efficiency program cycle from 2006 to 2008 and continued for the bridge year, 2009. RRIM applied to all the investor-owned gas and electric utilities: Pacific Gas and Electric, San Diego Gas and Electric, Southern California Edison, and Southern California Gas. Under the RRIM, the utilities would be eligible to earn an incentive payment of up to 12% of the net benefits of their energy efficiency programs if they achieved 100% of targeted energy savings. If they achieved between 85% and 100% of the savings goal, the highest incentive payment would be 9% of the net benefits. For the range between 65% and 85% of target, no incentives would be available. Below 65%, utilities could end up paying a financial penalty

---

[20] A similar adjustment, to a steeper slope to the incentives for higher savings relative to targets, has been done in Rhode Island with apparently favorable results. See the Rhode Island case study for more details.

[21] The state had incentives for utility energy efficiency from 1990 to 2001, with modifications every four-year program cycle, including performance incentives of varying percentages and amounts that were in place from 1990 to 1997. From 1998 to 2001, there were milestone-based incentives. From 2002 to 2005, following deregulation and the electricity crisis, there were no performance incentives.

of 5 cents per kWh, 45 cents per therm and $25 per kW for each unit below the savings goal (Gold 2014). These thresholds were referred to as earnings cliffs.

Expectations for energy efficiency program performance were high at this time, with the California Public Utilities Commission (CPUC) predicting an estimated $2.7 billion in net ratepayer benefits (resource savings minus investment costs)[22] from the 2006–2008 program cycle. The statewide incentives ceiling, or maximum incentive funding available, was $450 million, or $150 million per year. This represented the low end of comparable supply-side earnings and was below the average percentage of net benefits awarded through national shared savings mechanisms, but some found it controversial that the potential incentive payments were that high.[23] The mechanism as a whole was found by the CPUC to require improvements to make the earnings process more transparent, streamlined, and less controversial while still achieving the CPUC's policy goals.[24] Ultimately, near the end of the program cycle, the CPUC changed the mechanism to be a "flat" 7% of net benefits. This was at least in part to streamline the overall process and remove the "earnings cliffs".

The second period lasted from 2010 to 2012. The CPUC described this as a reform of the RRIM, though it was substantially different. During this period, the mechanism in place was a "management fee" of 5% of energy efficiency program spending, with the potential for an additional 1%, based on how well savings were calculated. This era was still dynamic, if not as contentious as the period leading up to it. Not only were the amounts established, again, toward the end of the program cycle, in November of 2012, but so was the mechanism itself.

The third recent evolution of performance incentives began with the Efficiency Savings Performance Incentive (ESPI). ESPI applied to energy efficiency programs beginning in 2013. The primary stakeholders had been part of the process for previous performance incentives as well. In general, the investor-owned utilities supported the mechanisms and the ESPI in particular, with some supporting it very strongly. The Natural Resources Defense Council (NRDC) was another stakeholder involved in the process. NRDC supported robust and effective policies to support energy efficiency programs, including well-designed utility performance incentive mechanisms. Other organizations engaged in the process through filing comments or other means included the Division of Ratepayer Advocates (DRA) and the Utility Reform Network (TURN). DRA and TURN consistently opposed the performance incentives, but TURN ultimately did not oppose the ESPI incentive mechanism itself.[25]

---

[22] CPUC (California Public Utilities Commission). 2007. Interim Opinion on Phase 1 Issues: Shareholder Risk/Reward Incentive Mechanism for Energy Efficiency Programs. Decision 07-09-043. Rulemaking 06-04-010.

[23] For comparison with California supply-side, see CPUC's "Interim Opinion on Phase 1 Issues: Shareholder Risk/Reward Incentive Mechanism for Energy Efficiency Programs."
http://www.cpuc.ca.gov/NR/rdonlyres/33471B66-CCCB-4999-B727-CB02CBAB8734/0/D0709043.pdf.

[24] For specifics about the areas of the mechanism that were not working as intended, and proposed remedies, see "White Paper on Proposed Energy Efficiency Risk-Reward Incentive Mechanism and Evaluation, Measurement, and Verification Activities," CPUC Energy Division, April 1, 2009.

[25] See TURN comments filed with CPUC dated July 16, 2012, on RRIM reform and April 26, 2013, on ESPI feedback.

When the ESPI was adopted by the CPUC in September 2013, it was designed to incorporate four fundamental objectives. These principles both addressed lessons learned from experience with prior incentive mechanisms and struck a relative balance or consensus among the priorities among major stakeholders. The CPUC asserted that "an effective incentive mechanism should incorporate:

(1) Clear performance goals;
(2) A clear understanding of how performance will be measured in relation to those goals;
(3) A timely and transparent process for independent measurement and verification of performance results; and
(4) Incentive earnings opportunities sufficient to motivate IOU performance, while providing cost-effective value to ratepayers."[26]

The relative values placed on these attributes is apparent in the structure of the ESPI, described below.

Incentive Policy Details

The ESPI is a multifactor incentive. It is predominantly an energy savings-based incentive mechanism that also features management fees for non-resource efforts (see explanation below) and codes and standards programs. Specifically, there are four paths for utilities to earn financial incentives:

1. *Lifecycle savings performance award.* Potential earnings are based on the programs' energy lifecycle savings achievements. Lifecycle energy savings include the kWh or therm energy savings over the full lives of the installed energy efficiency measures. This is a fundamentally different approach than the traditional first-year savings, which in comparison leads to a shorter-term focus. This breaks out to 85% for electric program performance (kWh and kW) and 15% for natural gas (therms). Within the electric, the potential award is weighted two-thirds for kWh (energy) savings and one-third for kW (demand) reductions. The maximum incentive for the savings component is 9% of total resource program spending.[27]

2. *Ex ante review and compliance.* This component awards earnings for demonstrated compliance with CPUC-set calculation standards. Ex ante are forward-looking energy savings estimates, in contrast to ex post, which are arrived at by conducting EM&V after the programs have been implemented, with the intent to estimate actual gross and net

---

[26] CPUC (California Public Utilities Commission). 2013. Order Instituting Rulemaking to Reform the Commission's Energy Efficiency Risk/Reward Incentive Mechanism. Decision Adopting Efficiency Savings and Performance Incentive Mechanism. Decision 13-09-023 Rulemaking 12-01-005

[27] "Resource programs" are what we traditionally think of as utility energy efficiency programs: those energy efficiency programs that aim to directly save energy. "Non-resource" programs, including energy efficiency research, education-only, or market transformation programs, have other primary purposes in addition to energy efficiency savings.

savings. Three percent of resource program spending, less certain administrative expenses such as EM&V, is the upper limit for this component.

3. *Non-resource management fee.* Earnings are a factor of the non-resource program spending levels for the utility. Non-resource programs include education, training, pilot programs, and new technologies. Three percent of non-resource program budget is the upper limit for this component. The fee is calculated as 3% of non-resource expenditures by utility, less administrative spending, as verified by commission audit reports.

4. *Codes and standards management fee.* This fee provides an earning opportunity for the utility based on the amount of codes and standards (C&S) program budget spent, capped at 12% of that budget. The fee is calculated as 12% of C&S spending by utility, less administrative costs.[28]

The largest of these four is the lifecycle savings performance award, which comprises 73% of the total dollar amount. The earnings amount is calculated in three steps. First, utilities must determine the ceiling, or maximum possible incentive. This is 9% of the total (statewide) resource program budget, less administrative costs. Second, utilities calculate what the dollar amount of the maximum award will be on a per-unit, lifecycle basis. This is done by multiplying the statewide first-year savings goal (such as the GWh goal) by the estimated portfolio average useful life of energy efficiency measures (for example, 12 years), and then adjusting the result by the portfolio average net-to-gross ratio and dividing the maximum possible incentive by the number of units, such as GWh. After actual energy savings achievements have been quantified, the third step is to multiply the amount of savings by the incentive award amount per unit. If, for example, the EE programs achieve 75% of that utility's savings goal, they will earn 75% of the maximum incentive.

There is no minimum savings threshold for the ESPI. The more savings, the better, in a linear progression toward the ceiling level, determined by the budget.

Other Relevant Regulatory Features

Performance incentives are one regulatory tool among many state policies that work together supporting gas and electric energy efficiency programs. While overall this is a reflection of commitment to energy efficiency achievements to meet public policy goals, it does make it difficult to isolate with much precision the specific impacts of the various performance incentive mechanisms on energy savings performance over time.

California has for many years had the largest and most extensive energy efficiency programs in the country, which is a direct result of its policy framework. In addition to performance incentive mechanisms, strong utility goals, and decoupling, California state

---

[28] For the language describing these calculations as ordered by CPUC, see Decision 13-09-023 *Decision Adopting Efficiency Savings and Performance Incentive Mechanism*

laws and regulations mandate the acquisition of all cost-effective energy resources, ahead of all supply-side resources.[29]

The energy savings goals are a particularly important part of the package of policies encouraging strong utility energy efficiency program performance.[30] The CPUC established electric and natural gas goals in 2008 for years 2012 through 2020, aiming for 16,300 GWh of gross electric savings over the nine-year period (see CPUC Decision 08-07-047). (For 2010–2012 energy efficiency portfolios, see Decision 09-09-047.) More recent targets under the ESPI are included in the approved 2013–2014 program portfolios and budgets for the state's IOUs. The targets call for gross electricity savings of almost 4,000 GWh and natural gas savings of approximately 94 MMTh for those two years (see CPUC Decision 12-11-015).

All the major investor-owned utilities have had decoupling in place since 2004. As with performance incentives, California has been implementing decoupling in various forms for decades. See more in the ACEEE state policy database.

California Performance Incentive Outcomes

During the 2006–2014 period (including the RRIM, the modified RRIM, and the ESPI), California utilities have generally been increasing electric energy efficiency program budgets (see figure A3). Utilities also achieved higher levels of energy savings in 2012 compared to 2006. However, their savings results showed more fluctuation from year to year.

---

[29] Assembly Bill 1890 (1996) http://www.leginfo.ca.gov/pub/95-96/bill/asm/ab_1851-1900/ab_1890_bill_960924_chaptered.html and Assembly Bill 995 (2000) http://www.energy.ca.gov/renewables/documents/ab995_bill_20000930_chap.html

30 For a history of the CPUC goal setting process by utility through 2010, see http://www.cpuc.ca.gov/NR/rdonlyres/E1E38C4A-5E56-4ACB-B0C9-AFD69656BFA0/0/goalsdecisionssummary.pdf.
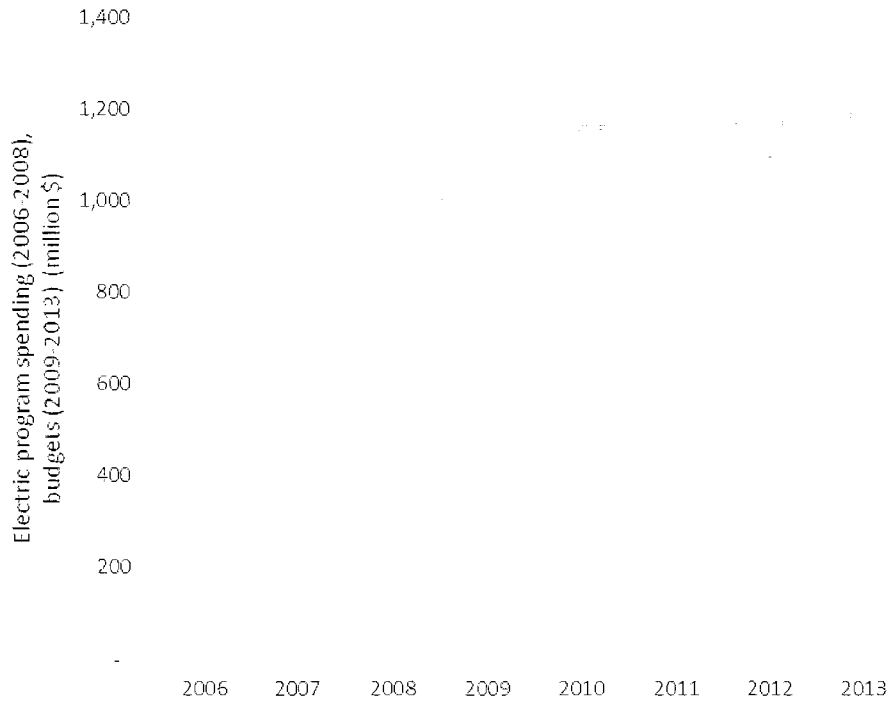
Figure A3. California electric program spending (2006-2008) and budgets (2009-2013). *Source:* ACEEE *State Scorecard* 2007-2013.

Figure A4 illustrates the increase in California electric energy efficiency program savings.

Figure A4. California energy savings 2006-2012. *Source: ACEEE State Scorecard* 2007-2013. Savings from *State Scorecard* are net incremental annual savings from Energy Information Administration Form 861 supplemented with addition data. Some year-to-year variation may be due to in part to net savings calculations methodologies and reporting. For additional data, see California Energy Statistics Portal, http://eestats.cpuc.ca.gov/Views/EEDataPortal.aspx.

Table A3. California energy savings results and performance incentive awards

Actual earnings/award (million $)	DSM total cost (million $)	Energy saved (annual)	Award as percentage of cost
Disbursed actual, 2010: 42.2	2010-2012: 2,508	2010-2012 (gross reported): 9,167 GWh, 155 MMTh 2010-2012 (net evaluated): 4,923 GWh, 94 MMTh	Actual, 2010: 6% 2010-2012, based on policy: 6%
2008 (first progress payment): 82.2 2009 (second progress payment): 61.5 2010 (final installment): 29	2006-2008: 1,929	2006-2008 (reported using ex-ante values): 9,999 GWh, 140 MMTh 2006-2008 (CPUC staff estimate based on evaluation reports): 4,097 GWh, 44 MMTh.	2006-2008: 9%

Sources: CPUC Decision 12-12-032 December 20, 2012. Alternate Decision Approving 2010-2012 Energy Efficiency Incentive Mechanism and Disbursing 2010 Incentive Awards; California Energy Statistics Portal; http://eestats.cpuc.ca.gov/Views/EEDataPortal.aspx ; CPUC staff estimate; Hayes et al. 2011.

Discussion

As a percentage of total energy efficiency spending, performance incentive award amounts for California utilities have ranged approximately from 5% to 9% during the 2006–2014 period. This is in the middle range relative to what other states' performance incentives were averaging during the latter half of this period.

To place these amounts in the context of the evolution of incentives in California, three considerations should be noted. First, the RRIM (2006–2008) started as a shared net benefits mechanism. If it had functioned as originally designed, it is reasonable to expect that actual incentive payments would have provided a substantially higher rate of earnings on EE than what happened. Second, during the 2010–2012 cycle, the amounts were calculated predominantly based on spending, which, compared to a shared net benefits approach, reduces performance risk for the utilities and therefore lower awards may be justified from that perspective. Third, the shift to the ESPI not only represents potential for increasing the incentive payments relative to EE budgets, but also the opportunity for improved regulatory certainty through greater clarity of goals, energy savings measurement, and processes. These improvements will fulfill the CPUC's criteria for an effective mechanism presented in the background section of this case study.

Those we interviewed emphasized the importance of clarity and timeliness in the process leading to EE performance incentive earnings in order for the mechanism to have the optimal, and intended, impacts on utility behavior. In particular they noted that the delays in setting out performance incentives after the efficiency programs have been run has had an adverse effect. Other than the first RRIM for the 2006–2008 program cycle, the mechanism has not been implemented on time. One observer explained that "the [incentive] dollars are not as valuable as if the mechanism and clear expectations were in place on time."

There was support for the ESPI and the current direction of the process. The 2013–2014 mechanism aligns with other CPUC policies to support long-term savings, giving IOUs more opportunity to optimize their energy efficiency portfolio to achieve the greatest returns. Another observer noted that for the utility role in supporting C&S, their investment returns 12% guaranteed, which is attractive. The incentive mechanism is viewed by some on the utility side as helping them to focus on their demand-side management efforts.

Program Evaluation and Regulatory Process

An energy efficiency expert in California summed up how the history of energy savings estimation has figured into performance incentive amounts, saying, "There have been challenges in California in terms of looking at ex ante and ex post savings values and the uncertainty that created for the utilities." There have been a variety of specific concerns over the years leading to conflicts and protracted non-resolution, a full discussion of which is beyond the scope of this case study. One of the many related issues has been how the energy savings that form the basis of the performance incentives should be counted.[31]

Looking Forward

Among those we interviewed in California, their outlook on the design and functioning of the ESPI is positive, considering it to be win-win approach. The CPUC has granted an extension to the Energy Division for complying with the schedule contained in the ESPI for when earnings awards shall be approved. While this is due to the process for evaluation contractors to be hired, get the needed data from the IOUs, and complete their work related to ex post savings—an important determinant of earnings award amounts—the extension is for 90 days only. This is a substantial improvement over the pace of past proceedings as discussed above.

Another shift that is cause for optimism is the move to rolling portfolios and evergreen programs. These create a longer-term framework for energy efficiency program planning. Energy efficiency funding was granted for 2015 and will continue unless changed for 10 years. The traditional program-year- or program-cycle-based approach, in comparison, leaves decision makers—at the utilities, program implementers, contractors, and trade allies—with an incentive to make decisions based on the short term. In conjunction with a predominantly lifecycle-savings-based performance incentive that contributes to utility earnings, the current mix of supportive regulatory policies addresses multiple concerns that impact energy efficiency performance.

INDIANA

Background

Indiana was one of the first states to enact a Certificate of Convenience and Public Necessity statute, back in 1983, requiring utilities to demonstrate need before constructing or

---

[31] Under the RRIM, the combination of sharp financial penalties for failure to achieve at least 65% of the energy savings goal, with differing estimates of net savings, can make the difference between millions in penalties or millions of dollars in awards. This was the case with PG&E. For a case study of how these two elements influenced California regulation, see Gold 2014.

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 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, with utilities contracting with a single independent third-party administrator for a basic set of statewide programs (core programs), and utilities individually administering additional energy efficiency programs (Core Plus programs) in their own service territories, to address aspects not covered by the Core programs. The order also established an 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 the issue of utility performance incentives for energy efficiency, Indiana had actually established a performance incentive rule in 1995 (170 IAC 4-8-6) as part of its guidelines for DSM cost recovery. However, as noted above, very little DSM was taking place. Now, subsequent to the 2009 order, four out of the five major electric utilities (Indiana Michigan Power [I&M], Indianapolis Power and Light [IPL], Vectren Indiana, and Duke Energy Indiana) have approved mechanisms. (Per the IURC 2009 order, utilities are eligible to apply for shareholder incentives relating to their Core Plus programs.) Table A5 provides summary data for three of the utilities.

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 had been established by the IURC. 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 policy regarding utility incentives for energy efficiency, the entire framework for utility energy efficiency programs in Indiana is somewhat uncertain at this point.

Policy Details

In the first phase of incentives after the 2009 order, three utilities (IPL, Vectren, and Duke) originally had similar tiered-savings mechanisms, where the incentive is calculated as a percentage of program costs, and the percentage to apply is determined by the level of savings achieved relative to the savings goal for that year. There is also the potential for a penalty, if savings achieved are less than 50% of the goal. Vectren subsequently had its incentive modified to a share of net benefits approach (see description below), and Duke's tiered structure has been updated per settlement agreement included in an order issued under 43955 DSM-2. Duke now has additional constraints such as a higher floor, no penalty, a lower ceiling, and an overall cap on incentive earnings. We provide the most recent incentive structure for Duke Energy as an example in table A4.

Table A4. Duke incentive structure

Percentage of annual kWh target achieved	Incentive as percentage of EE program cost
0–74.99%	0%
75–79.99%	6%
80–89.99%	8%
90–99.99%	10%
100–109.99%	12%
≥ 110%	12.13%

Source: Cause No. 43955 DSM 02 Final Order

Savings for these tiered-savings mechanisms are calculated on a gross-savings basis.

For more details, see the most recent orders for each utility addressing the mechanism (IPL: Cause No. 44497; Vectren: Cause No. 44495; Duke: Cause No. 43955).

Two utilities (I&M and Vectren) now have an incentive mechanism designed as a share of net benefits. The mechanism calculates net benefits using the utility-cost approach (i.e., total utility EE program costs compared to utility system benefits in the form of avoided capacity and energy costs). The incentive that may be earned is capped at an amount equivalent to a certain percentage of program costs (Vectren 10%, I&M 15%). For those utilities with authority to receive an incentive, all must achieve some minimum percentage level of the savings goal in order to qualify for an incentive.

For more details on the I&M mechanism, see Cause No. 44486, December 3, 2014.

To illustrate the results of these mechanisms, the table provides the energy savings and incentive results for the most recent two years for two largest tiered-savings utilities and one share of net benefits utility.

Other Relevant Regulatory Features

Indiana previously had an EERS in place, but this policy was eliminated by the 2014 Indiana General Assembly. Four of the five largest IOUs in Indiana currently collect lost margins for sales lost because of efficiency programs. The fifth utility, Indianapolis Power and Light, is awaiting a commission order to recover lost margin. There are no electric companies in Indiana with decoupled rates. However, of the three largest natural gas distribution companies operating in the states, two of them 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 of a company meeting the voluntary standard. However no company has formally requested commission approval to participate in the standard.

Energy Savings Outcomes

Figure A5 illustrates the increase in Indiana's electric energy efficiency program savings.
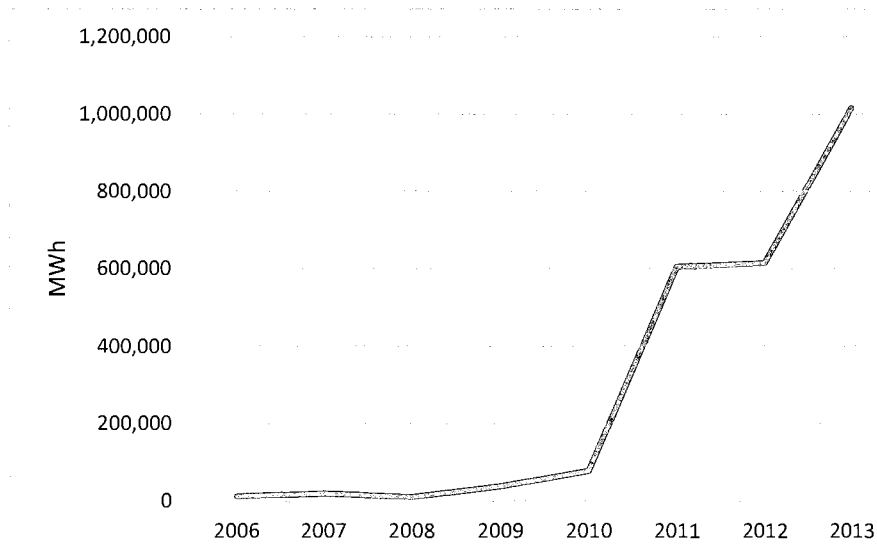
Figure A5. Indiana's energy savings 2006-2013. *Source:* ACEEE *State Scorecard* 2007-2014.

Financial Outcomes

Table A5 shows utility incentives and program costs.

Table A5. Utility energy efficiency program cost and performance incentive amounts

Company	Incentive	Program cost	Total annual energy savings (MWh)	PI as percentage of program cost
		2013		
Duke Energy	$981,232	$9,035,050	78,472	10.86%
Indianapolis Power and Light	$463,760	$5,797,000	43,902	8.00%
Indiana Michigan Power	$826,646	$8,336,021	21,981	9.92%
		2012		
Duke Energy	$757,080	$5,047,198	51,288	15.00%
Indianapolis Power and Light	$362,640	$6,521,640	18,572	5.56%
Indiana Michigan Power	$0	$949,178	3,311	0.00%

Source: Indiana Utility Regulatory Commission

Discussion

As noted above, Indiana had established the possibility of utility performance incentives (as well as lost revenue recovery) in 1995, in connection with its integrated resource planning rule and guidelines for DSM cost recovery (170 IAC 4-8-6). The utility response in terms of energy efficiency programs prior to the 2009 IURC order was very minimal and deficient in many respects (e.g., lacking evaluation plans and protocols). Therefore there was little impetus to move forward with things like performance incentives and LRAM.

Consequently, a key objective in approving the shareholder incentives mechanisms in 2009 and 2010 was to support achievement of the energy efficiency goals established in the 2009 order. The results have been fairly successful. Three out of the five utilities met their targets for 2012. Four out of five met them for 2013, and all but one met their cumulative targets for the three-year time frame 2011–2013. In the opinion of staff interviewed, the incentives did significantly affect utility behavior—in terms of both utility energy efficiency budgets and savings—but this was particularly in the context of the 2009 order requiring energy efficiency programs. In the words of one staff member,

> The primary thing that affected utility behavior is that DSM was no longer voluntary with the issuance of the 2009 order. It was mandatory. It was structured. It had compliance deadlines and oversight boards. At that point the LRAM and incentives became a huge focus for utilities.

From the Indiana experience, an overarching observation is that the existence of a policy allowing performance incentives (and also lost revenue recovery) was apparently not sufficient to generate meaningful utility energy efficiency programs in the decade preceding the 2009 IURC order. In the opinion of both Staff and advocate organizations, the key factor was the 2009 order creating the annual energy savings requirements (i.e., essentially an EERS).

It remains to be seen how utility performance will fare now that the annual savings requirement has been terminated. At this point the Indiana utilities have all filed and had approved one-year plans to continue some energy efficiency programs during 2015. Early indications suggest that while programs will continue, they will deliver lower savings than in previous years.

Evaluation

For the Core Plus programs, the programs for which a performance incentive is possible, each individual utility is responsible for hiring an independent evaluator to evaluate its programs. Although there is no formal central oversight process such as there was with the DSM Coordinating Committee for the statewide Core programs, each utility has an oversight committee with, at a minimum, representatives from the OUCC, and most also have participation from other stakeholders. The committees are involved in reviewing the work and reports prepared by the evaluator.

For the utilities using the simple tiered-incentive approach described earlier, gross savings are used as the indicator of program impact. For the utilities using a share of net benefits approach, savings are determined using net savings (i.e., adjusted for free-riders).

Process

The experience with the performance incentive mechanisms is fairly limited thus far, and it is too soon to draw conclusions about the process. Staff felt that as utilities utilize and incorporate program evaluation results into the calculations the utilities use to determine their requested incentives, important experience will be gained and the process improved. The OUCC is theoretically in a position to audit the process utilities use and their reported numbers, although the limited time and resources available to the OUCC limits their ability

to audit. This need is partially offset by the participation of the OUCC in the utility-specific oversight boards.

Looking Forward

Interestingly, all three utilities that originally had a tiered incentive structure have requested a shared net benefits approach, such as the structure used for I&M. More broadly, however, the policy landscape for utility energy efficiency in Indiana is fairly uncertain at this point. In the governor's letter to the legislature after the enactment of SB 340 he 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, performance incentives) will remain or will be put in place.

At this point the Indiana utilities have all filed 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.

MASSACHUSETTS

Background

Performance incentives for energy efficiency have existed in Massachusetts for electric companies since the early 1990s. The current performance incentive policy was established in the Green Communities Act of 2008. The act required gas and electric companies to file energy efficiency investment plans with the Department of Public Utilities (DPU). The three-year plans required detailed acquisition strategies for all cost-effective energy efficiency. The plans also were to include a proposal for a mechanism to recover a performance incentive based on meeting or exceeding goals proposed in the plan.[32] There have been two cycles of three-year plans filed since the enactment of the Green Communities Act. The first plan laid the foundation for a performance incentive based on DPU precedent and guidelines included in the Green Communities Act of 2008.

The first three-year plan was filed in 2009 for program years 2010 through 2012. The performance incentive mechanism approved with this plan was made up of three components: a savings mechanism, a value mechanism, and a performance metric mechanism. Both the savings and value mechanism incentive payments are based on benefits for the energy efficiency programs. The savings mechanism focused on total benefits, while the value mechanism focused on net benefits. The payout rate for both

---

[32] Green Communities Act 2008. Sec 21 (b)(2)

incentives is applied uniformly across all program administrators including investor-owned utilities (PAs) and determines the incentive amount a PA can receive for each dollar of benefit achieved through the implementation of a program.[33] The payout rates were calculated based on projected benefits and a statewide available incentive pool of $65 million. The allocation of the incentive pool to individual PAs is based on the PA contribution to the statewide savings goals.

The performance metric incentive created both overall targets and targets for specific customer sectors. An incentive amount was allocated for individual PAs after meeting targets specific to each metric. The DPU required PAs to demonstrate annually how each metric was fulfilled. Some metrics, such as CoolSmart: Increase Percent of Correct Installations were easy to quantify.[34] Others, such as the MassSAVE/Weatherization: Increase Direct Installation (DI) bulb penetration, were more difficult to quantify. For the metrics that were more difficult to quantify, the DPU required PAs to make a showing on how necessary steps were taken to meet the specific goal.

Table A6 shows the features and details of the three components of the incentive mechanism.

Table A6. Massachusetts performance incentive structure 2010–2012 three-year plan

Component	Percentage of incentive pool	Purpose	Threshold/limit	Calculation of incentive
Savings mechanism	2010: 45% 2011: 50% 2012: 52%	Encourage maximum total benefits	75% of MWh goal, no limit	Payout equal to percentage of the statewide incentive pool allocated to the savings mechanism divided by the projected statewide benefits multiplied by actual benefits
Value mechanism	35%	Encourage maximum net benefits and cost-effectiveness	75% of MWh goal, no limit	Same as savings mechanism, but instead of total benefits, net benefits are used
Performance metrics	2010: 20% 2011: 15% 2012: 13%	Encourage benefits not included in value and savings mechanism	75% – Threshold 100% – Design 125% – Exemplary	Varies by metric

* Performance metric incentive specifics were approved in Orders in DPU 09-116B through DPU 09-118B and DPU 09-120 through DPU 09-127B. *Source:* DPU 09-116 through DPU 120 January 28, 2010 Order.

---

[33] Order on DPU 09-116 through DPU 09-120.

[34] This performance metric required electric utilities to increase the percentage of quality installs and properly sized installs in homes that receive a CoolSmart rebate. The goal is based on the increase in percentage over the baseline.

The most recent performance incentive mechanism was approved for the 2013 through 2015 three-year plans.[35] There were several changes in the performance incentive mechanism from the 2010 through 2012 three-year plan. The total statewide performance incentive pool is $80,056,269 for electric program administrators and $16,002,485 for gas. This was an increase in the electric pool and a decrease in the gas pool. Instead of a 75% threshold for PAs to earn the savings and value incentives, each PA has a different energy savings threshold required to begin earning a performance incentive. For example, Unitil Electric must meet 76.72% of its goals before earning an incentive, while Columbia Gas only needs to meet 70.78%. The allocation of the incentive pool also changed. Instead of an annual change in the savings mechanism and performance metric allocation of the pool, fixed percentages were used for all three years. These allocations are listed below under the policy details section. Finally, the performance metric goals were updated and some metrics were eliminated.

Other Relevant Regulatory Features

The Massachusetts Green Communities Act of 2008 requires electric and gas utilities to obtain all cost-effective energy efficiency. Three-year goals are established in triennial plans filed by electric and gas utilities. Electric and gas utilities in Massachusetts have also been fully decoupled since 2008.

Policy Details

Currently, the structure of the incentive mechanism for the 2013–2015 three-year program plans includes two components: the savings and value mechanisms. The performance incentive for each utility is the sum of these two components. The calculation of the savings component payout is the adjusted statewide incentive pool divided by the projected dollar value of statewide benefits. The calculation produces a payout rate per dollar of total benefits. The payout rate for the value mechanism is determined in the same manner except net benefits are used instead of total benefits.

The approved incentive pool available for the 2013–2015 period is $80,056,269 for electric program administrators and $16,002,485 for gas. This pool is equal to approximately 5% of the statewide electric budgets and 3% of the statewide gas program budget. The allocation of the statewide incentive pool is as follows: 61.5% to savings mechanism and 38.5% to value mechanism. The thresholds for both savings and value mechanisms, shown in table A7, vary by utility.

Table A7. Massachusetts performance incentive savings and thresholds by utility 2013–2015

Program administrator	Threshold (%)
Unitil (electric)	76.72
Berkshire Gas	76.72
NEGC	76.72

---

[35] *See* Massachusetts Three Year Efficiency Plans Order DPU 12-100 through DPU 12-111. 1/31/13.

Program administrator	Threshold (%)
Unitil (gas)	76.72
NSTAR Electric	76.32
NSTAR Gas	76.25
National Grid (electric)	75.65
National Grid (gas)	75.16
WMECo	72.46
Columbia Gas	70.78

Source: Massachusetts Three-Year Efficiency Plans
Order DPU 12-100 through DPU 12-111, 1/31/13

Outcomes

Table A8 shows program costs, energy savings, and incentives for electric and gas. companies.

Table A8. Massachusetts statewide energy efficiency program cost and performance incentives, 2003–2013

Year	Program cost	Energy savings	Performance incentive	Percentage of program costs
		Electric (MWh)		
2003	$107,980,774	317,571	$8,313,920	7.70%
2004	$122,694,191	442,164	$9,625,058	7.84%
2005	$113,875,666	454,726	$9,607,335	8.44%
2006	$120,352,651	417,031	$10,128,897	8.42%
2007	$110,976,339	489,622	$9,181,020	8.27%
2008	$115,103,427	388,254	$9,281,413	8.06%
2009	$175,526,256	424,617	$12,904,615	7.35%
2010	$221,090,179	603,460	$17,577,689	7.95%
2011	$254,692,915	765,226	$20,478,218	8.04%
2012	$361,392,739	950,887	$24,145,526	6.68%
2013*	$466,748,563	1,026,520	$27,379,880	5.87%
		Gas (MMBtu)		
2010	$62,657,153	1,123,915	$4,075,030	6.50%
2011	$97,247,817	1,518,116	$4,213,081	4.33%
2012	$135,120,261	2,262,716	$5,165,768	3.82%
2013*	$171,403,031	2,466,798	$5,413,645	3.16%

* 2013 data not yet approved. *Source:* DPU.

The data show a consistent recovery of approximately 8% of program cost as a performance incentive since 2003. Performance incentives paid have declined in recent years as the total amount available for performance incentives has declined relative to program costs. The

57

total dollar amounts of incentives have still been increasing and are projected to continue to increase as program costs continue to increase. While the performance incentive pool has been limited to approximately 5% of total program cost since 2010 for electric utilities, program administrators are able to earn additional incentives for exceeding planned total benefits, net benefits, and performance metric goals. This is the reason the percentage of program costs has exceeded 5% since 2010. Overall, program administrators in Massachusetts have been exceeding planned performance goals to earn performance incentives greater than 5% of program cost.

Discussion

Massachusetts' newest performance incentive structure is still being refined after going through two approval processes in 2009 and 2012. The consensus of the stakeholders interviewed by ACEEE staff for this report is that performance incentives have been successful in encouraging higher levels of performance. This may be due to the combined effect of multiple policies creating an overall environment that addresses disincentives and pulls for higher savings: all cost-effective energy efficiency, decoupling, savings goals, high program budgets, etc. The performance incentive mechanism is designed to incentivize program administrators to meet savings goals in the most cost-effective manner. The performance metric mechanism is designed to achieve other policy objectives for specific programs. The debate in Massachusetts regarding the performance incentive has focused on the total incentive pool, not the existence or nonexistence of an incentive.

Looking Forward

Currently, Massachusetts is in the middle of a three-year energy efficiency plan cycle. New three-year plans for 2016 through 2018 will be filed next year. Within those plans, it is likely program administrators and other stakeholders will file requested changes to existing performance incentives. However Massachusetts operates some of the most successful utility-sponsored programs in the country. Major changes to the incentive structure or elimination of incentives entirely is not expected in the near future.

MICHIGAN

Background

Michigan had a history of fairly aggressive energy efficiency programs until 1995, when energy efficiency programs and integrated resource planning were discontinued during the move toward electric restructuring. Michigan had essentially no utility-sector energy efficiency programs from 1996 until 2008.

Public Act 295 of 2008 (enrolled SB 213) brought energy efficiency programs back to Michigan in the form of an EERS that requires all electric utilities and all natural gas utilities to file energy optimization (efficiency) programs with the Michigan Public Service Commission (MPSC). Public Act 295 offers multiple options for utilities for energy efficiency program administration, including administration by the utility itself, or through an independent administrator selected by the MPSC. In practice, the largest utilities in the state have chosen to administer their own energy efficiency programs.

PA 295 established an EERS with annual savings requirements for electric utilities of 0.3% in 2009, 0.5% in 2010, 0.75% in 2011, and 1.0% per year for 2012 through 2015 and each year

thereafter. For natural gas utilities, the EERS savings was 0.1% in 2009, 0.25% in 2010, 0.5% in 2011, and 0.75% per year for 2012 through 2015 and each year thereafter. Spending for each utility was capped at 0.75% of total retail revenues in 2009, 1.0% in 2010, 1.5% in 2011, and 2.0% in 2012 and each year thereafter.

PA 295 (2008) contains two provisions whereby utilities can receive an economic incentives for implementing energy efficiency programs. First, they are allowed to request that energy efficiency program costs be capitalized and earn a normal rate of return. Second, they are allowed to request a performance incentive for shareholders if the utilities exceed the annual energy savings target. Performance incentives cannot exceed 15% of the total cost of the energy efficiency programs, or 25% of net benefits, whichever is less.

Act 295 also authorized natural gas decoupling, which has been implemented in a series of commission orders. The MPSC subsequently approved decoupling proposals for electric utilities Consumers Energy and Detroit Edison (U-15768 and U-15751), but commission decoupling orders for electric utilities were overturned in court on the basis of lack of specific statutory authority. (See Michigan Court of Appeals *Association of Businesses Advocating Tariff Equity v. Michigan Public Service Commission*, April 10, 2012). In light of the court's determination, the commission dismissed all pending cases involving electric revenue decoupling.

Incentive Policy Details

The utility energy efficiency performance incentive mechanism in Michigan has evolved somewhat over time. Initially it was a fairly simple sliding scale of incentive (defined in terms of percentages of energy efficiency program spending), tied to meeting or exceeding the energy savings annual target. The maximum incentive that could be earned was an amount equivalent to 15% of program spending or 25% of net benefits, whichever was smaller.

The current mechanism is a performance-based incentive with multiple criteria (one of which is still the amount of savings relative to the goal, but others include things like meeting minimum levels of low-income customer participation, the percentage of participating customers that install multiple measures, etc.). The current mechanism for the two largest utilities was established in 2012 and implemented for program year 2013.

The amount of incentive is still capped at the statutory level (15% of spending or 25% of net benefits). Additional threshold requirements are an overall portfolio benefit-cost ratio (using the Utility System Resource Cost Test, i.e., a utility cost test) of 1.25, and meeting 100% of the annual energy savings goal. There are no penalties in the incentive mechanism. Savings are determined using net savings.

Other Relevant Regulatory Features

Michigan adopted an EERS in 2008 with the passage of the Clean, Renewable, and Efficient Energy Act (PA 295). The EERS has both electric and gas savings targets that increase annually. The Michigan Public Service Commission previously approved decoupling for the state's two largest investor-owned electric utilities, Consumers Energy and DTE Energy, but the ruling was overturned by the state appellate court. Natural gas companies in Michigan

have implemented a decoupled rate structure as natural gas distribution companies were not affected by the appellate ruling overturning electric decoupling.

Energy Savings Outcomes

Figure A6 illustrates the increase in Michigan electric energy efficiency program savings.
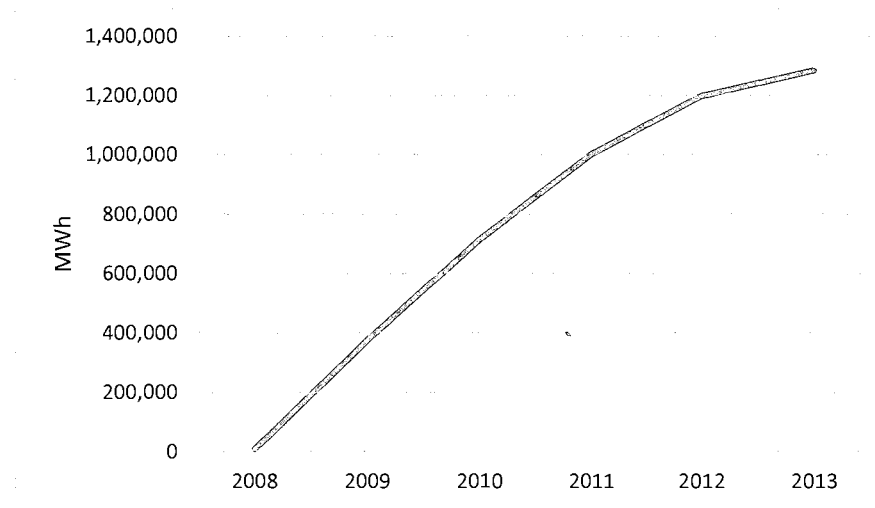
Figure A6. Michigan energy efficiency savings 2008–2013. *Source:* ACEEE *State Scorecard* 2009–2014.

Financial Outcomes

Table A9 shows 2012-2013 Michigan performance incentives and savings.

Table A9. Michigan energy efficiency performance incentives and savings, 2012–2013

Company	Incentive	Fuel	Program cost	Total annual energy savings	PI as percentage of program cost
			2013		
Consumers Energy	$17,530,000	Gas	$47,776,949	2,173,124 MCF	15.00%
		Electric	$69,097,040	473,045 MWh	
DTE Energy	$15,085,266	Gas	$25,600,000	1,436,000 MCF	15.00%
		Electric	$74,900,000	614,000 MWH	
			2012		
Consumers Energy	$17,327,620	Gas	$48,148,786	2,378,978 MCF	15.00%
		Electric	$67,369,007	409,353 MWh	
DTE Energy	$14,732,686	Gas	$28,600,000	1,186,000 MCF	15.00%
		Electric	$69,600,000	611,000 MWH	

Source: Michigan Public Service Commission

60

Discussion

The regulatory package established in Michigan in 2008 through PA 295 appears to have worked very well. Michigan utilities went from essentially no-customer energy efficiency programs prior to the legislation, to meeting and exceeding the EERS savings goals every year since the legislation. By all accounts the existence of the utility performance incentive has been a major factor in securing utility management support for the energy efficiency programs. As shown in table A9, the major utilities have generally succeeded in earning the maximum incentive each year.

One concern that has been identified is the tendency for EERS goals established in terms of annual savings to motivate the use of quick, short-term savings measures and programs rather than more comprehensive and longer-term measures. That is one reason the MPSC staff modified the incentive mechanism structure to include elements of comprehensiveness, and not just first-year annual savings.

Evaluation

Utilities are responsible for hiring independent evaluation consultants to evaluate their programs. For key assumptions and technical inputs, the evaluators must use the technical reference manual that is established and overseen by the MPSC through a multiparty energy optimization collaborative process. Utilities submit evaluation results and incentive claims that are reviewed and decided upon in a contested-case process.

Michigan uses net savings for determining any incentive awards.

Looking Forward

Michigan's legislation (PA 295) called for a review of the utility energy efficiency policy in 2015. By all accounts, the policy has been very successful to date, so one might not expect major changes. Two areas for improvement that have been discussed are eliminating the spending cap on energy efficiency programs (currently 2% of utility revenues) and clarifying that electric utilities are eligible for decoupling.

MINNESOTA

Background

Minnesota has a long history of utility energy efficiency programs, dating back well over two decades. In the mid-1990s, Minnesota tried out an LRAM policy, but the cumulative amounts of lost revenue recovery over time became excessive and controversial. The LRAM policy was ended in 1999, and the state shifted to a shareholder incentive approach. Minnesota has maintained substantial utility energy efficiency programs throughout that time period to the present.

In 2007, the Minnesota Legislature passed the Next Generation Energy Act of 2007 (Minnesota Statutes 2008 § 216B.241). Among its provisions is an EERS that sets energy-saving goals for utilities of 1.5% of retail sales each year. This act also directed the Public Utilities Commission to allow one or more rate-regulated utilities to participate in a pilot program (of up to three years) to assess the merits of a rate-decoupling strategy. Although no decoupling mechanism had yet been adopted for an electric utility as of February, 2015, two gas utilities do have decoupling in place. The commission continues to examine

decoupling and has established criteria and standards to be used when considering proposals from utilities. A decoupling proposal for Xcel is before the commission.

Minnesota has had a shared benefit incentive mechanism in place since 1999. The details have been modified at various times. The current version is described below. Also, Minnesota's regulated utilities are required to file integrated resource plans with the Public Utilities Commission.

Policy Details

Minnesota's utility performance incentive for energy efficiency is based on a shared net benefits approach. The most recent version was approved on December 12, 2012. The incentive mechanism starts at a threshold of energy savings achieved equal to the lesser of 0.4% of retail sales or 50% of an average of the last five years' achievement levels. As energy savings levels increase to 1.5% of retail sales, utilities are awarded an increasing share of net benefits created. The mechanism is calibrated so that when electric utilities achieve energy savings approximating 1.5% of retail sales, the utility is rewarded with an incentive equal to an average of 7 cents per first year kWh saved. The amount of the incentive varies with the actual cost effectiveness of the implemented projects. There are two caps on the amount of incentives: the average incentive may not exceed 8.75 cents per first year kWh and may not exceed 20% of net benefits. That is the case for Xcel Energy, Interstate Power and Light, and Otter Tail Power. For Minnesota Power, the caps are 8.75 cents per first year kWh and 30% of net benefits.

Incentive payments are based on gross savings. There is no penalty component to the mechanism.

Natural gas utilities have a very similar incentive mechanism, except that the incentive structure is calibrated around a 1% annual savings target, instead of the 1.5% for electric utilities.

Other Relevant Regulatory Features

In 2007, the Minnesota legislature passed an EERS setting savings targets for electric and gas utilities. Minnesota does not allow electric companies to collect lost revenue associated with energy efficiency but has approved decoupling for two natural gas distribution companies, Minnesota Energy Resources Corporation and Center Point Energy.

Energy Savings Outcomes

Figure A7 illustrates the increase in Minnesota electric energy efficiency program savings.

Figure A7. Minnesota energy efficiency savings 2006-2013. *Source:* ACEEE *State Scorecard* 2007-2014

Outcomes

Table A10 shows 2011-2012 Minnesota performance incentives and savings.

Table A10. Minnesota gas and electric energy efficiency program cost, savings, and performance incentives, 2011-2012

Company	Incentive	Program cost	Total annual energy savings	PI as percentage of program cost
		2012		
Xcel Electric	$53,911,925	$87,071,903	533,478 MWh	61.92%
Otter Tail Power	$2,681,575	$4,816,994	30,794 MWh	55.67%
Center Point Energy	$3,207,411	$19,226,405	13,664 Dth	16.68%
Xcel Gas	$2,682,879	$13,040,587	7,671 Dth	20.57%
		2011		
Xcel Electric	$52,004,975	$76,302,262	465,444 MWh	68.16%
Otter Tail Power	$2,608,094	$4,344,581	27,958 MWh	60.03%
Center Point Energy	$4,950,392	$18,990,010	15,284 Dth	26.07%
Xcel Gas	$2,833,202	$11,359,730	7,471 Dth	24.94%

Source: Minnesota Public Service Commission

Discussion

Minnesota's current utility performance incentive approach may well be providing the highest level of energy efficiency performance incentives as a percentage of program costs in the nation. As shown in table A10, over the most recent two years for which data are available, the incentives have been equivalent to well over half to as much as two-thirds of

program costs for the electric utilities. This has been a source of concern for many parties, including the attorney general, industrial customer representatives, and the staff of the Minnesota Department of Commerce.

It should be noted that Minnesota's electric utilities had neither LRAM nor decoupling mechanisms in place during this time period. In the absence of a decoupling mechanism, it is possible that the performance incentive may have functioned in part as a way to mitigate utility concerns about the impact of energy efficiency on the recovery of its authorized revenue requirement. Natural gas utilities do have decoupling, and their incentive amounts relative to program spending are much lower. Nevertheless, the question has been raised as to whether that high level of incentive is really necessary to sustain a high level of electric energy efficiency program effort.

Evaluation

Energy savings for prescriptive rebates are based on energy savings found in the Minnesota Technical Reference Manual and customized savings algorithms approved by the Department of Commerce as part of a utility's DSM plan.[36] A measurement and verification protocol exists for larger projects, including billing analysis and submetering.

Utilities analyze their programs using the above protocols and submit the results to the commission in a docket to claim the incentive. Other parties can weigh in on the calculation of the incentive and the timing. The commission then issues an order for an approved incentive amount, and these amounts are rolled into the energy efficiency charge to customers (along with program costs).

Looking Forward

The largest electric utility in the state, Xcel Energy, has a pending proposal to adopt decoupling, and that may change the dynamics around the amount of performance incentive allowed. Also, the Department of Commerce is conducting a review and is due to release a report in July 2015, to include recommendations on these issues.

MISSOURI

Major legislation was enacted in 2009 that marked a major turning point for utility energy efficiency programs in Missouri. The Missouri Energy Efficiency Investment Act (MEEIA, SB 376), passed and signed into law in 2009, established a regulatory framework for utility energy efficiency programs to value demand-side investments equal to traditional investments in supply and delivery infrastructure. Prior to passage of MEEIA, Missouri had limited energy efficiency programs for utility customers even though utilities were required to file and implement electric utility integrated resource plans.

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

---

[36] http://mn.gov/commerce/energy/topics/conservation/Design-Resources/Technical-Reference-Manual.jsp.

- 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 program investment cost-recovery mechanisms (DSIM) for demand-side management 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 efforts to establish cost recovery and incentive mechanisms meeting the above objectives were not approved in the company's 2011 general rate case. When the commission and utility reached an agreement that established a DSIM, the impact was significant. The stipulation and agreement was between Ameren Missouri and parties to its 2012 MEEIA (2013–2015 plan) application; the agreement was approved by the commission on August 12, 2012. 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 prior to establishing its own version of a DSIM late in 2014. Once 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 implement a full three-year plan. KCP&L Greater Missouri Operations (GMO), a utility-operating company owned by the same corporation as KCP&L and that serves an area surrounding Kansas City, has followed a similar path as KCP&L. GMO had in place a small set of programs prior to establishing a DSIM; with this 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 both for recovery of programs' costs and lost revenues resulting from the programs and the opportunity for incentive awards. The incentive mechanisms are based on receiving a percentage of net shared benefits as determined by deemed savings for lost revenues recovery and by program evaluations for incentive awards. MEEIA's provisions supporting energy efficiency are not mandatory. MEEIA enables utilities to propose and implement such programs but does not require them. The specific language from the statute is the following:

> 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.

Policy Details

The basic structure of the demand-side incentive mechanisms (DSIMs) established for Ameren MO, KCP&L, and GMO is the same, but details differ.

Ameren Missouri's DSIM was established by a unanimous stipulation and agreement resolving Ameren Missouri's MEEIA Filing (Case No. E0-2012-142) among Ameren Missouri, the staff of the Missouri Public Service Commission, the Office of Public Counsel, the Missouri Department of Natural Resources, the Natural Resources Defense Council, Sierra Club, Renew Missouri (Earth Island Institute), the Missouri Industrial Energy Consumers, and Barnes-Jewish Hospital. The DSIM agreed to by these parties and approved by the Commission addresses program cost recovery, net shared benefits relating to the throughput disincentive, and net shared benefits relating to the performance incentive. The provision addressing net shared benefits relating to the performance incentive is structured this way:

- After the conclusion of the three-year MEEIA plan period and using final EM&V results, Ameren Missouri will be allowed to recover the performance incentive, which is a percentage of net shared benefits (NSB) according to the graduated or sliding scale (shown in the schedule below). The cumulative annual net megawatt-hours determined through EM&V to have been saved as a result of the MEEIA programs will be used to determine the amount of the performance incentive. The sliding scale established determines the amount of the performance incentive award amount for the three-year MEEIA plan.
- The savings metric used to determine the performance incentive is equal to the cumulative net MWh savings determined through EM&V divided by Ameren Missouri's total targeted 793,100 MWh, which is the cumulative annual net MWh savings in the third year of the three-year MEEIA Plan period.
- The targeted net energy savings are adjusted annually for full program-year impacts on targeted net energy savings caused by actual opt-out.
- Actual net energy savings for each program year are determined through the EM&V, including full retrospective application of net-to-gross ratios at the program level using EM&V results from each of the three program years. The sum of these three program years' annual net energy savings is used to determine the amount of the performance incentive award, following the schedule presented in table A11 and figures A8 and A9.

66

Table A11. Ameren Missouri performance incentive schedule

% of MWh target	Three-year total ($MM)	% of net benefits*
<70	$0.00	0.00%
70	$12.00	4.60%
80	$14.25	4.78%
90	$16.50	4.92%
100	$18.75	5.03%
110	$22.50	5.49%
120	$26.25	5.87%
130	$30.00	6.19%
>130		6.19%

* Includes income taxes (i.e., results in revenue requirement without adding income taxes). The performance incentive awarded will be based on percentage of net benefits. The percentages are interpolated linearly between the performance levels. *Source:* Missouri Public Service Commission
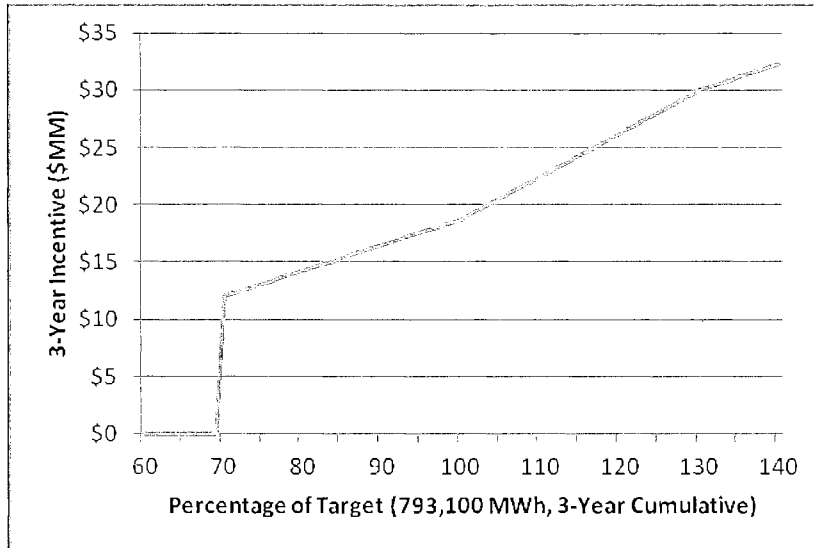
Figure A8. Ameren Missouri performance incentive schedule in dollars. *Source:* Missouri Public Service Commission.

67
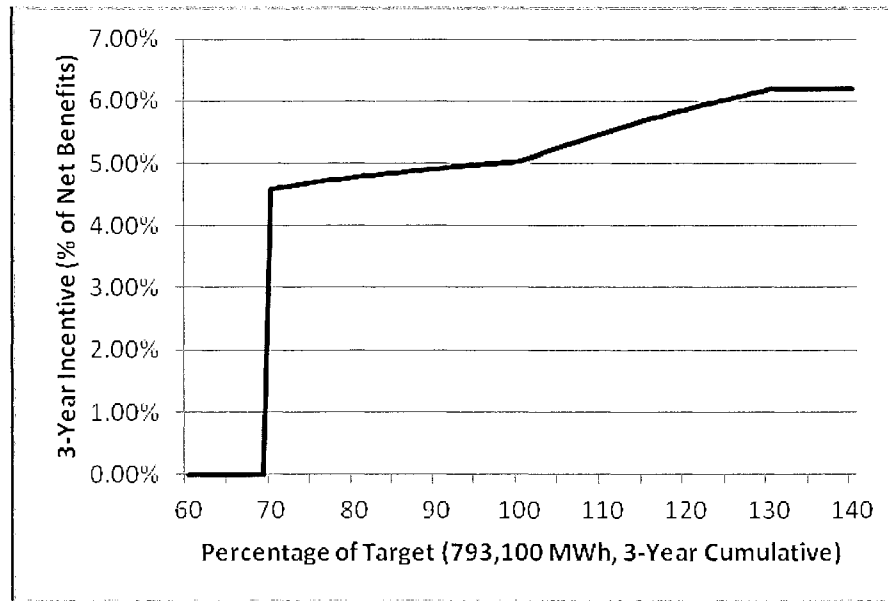
Figure A9. Ameren Missouri performance incentive schedule as percentage of net benefits. *Source:* Missouri Public Service Commission.

The agreement includes a provision for final recovery true up of any performance incentive award amount.

Outcomes

It may be too early in the initial program plan periods for the utilities with DSIMs in place to assess the full impacts and associated financial outcomes, particularly as they apply to the performance incentives, as these are not determined until full EM&V results are determined after the applicable full program plan periods (3 years for Ameren Missouri and GMO, 18 months for KCP&L's initial plan). Ameren Missouri is exceeding program savings targets and is on track to receive full incentive amounts.

Missouri's DSIMs (addressing both the throughput disincentive and shareholder performance incentive) are very new. Ameren Missouri's and GMO's mechanisms each have completed the first full program years (2013 data are complete; 2014 data are not yet final) associated with the mechanisms. KP&L's mechanism was enacted in July 2014.

While early in the process associated with determining and awarding these incentives, the impact of having these mechanisms in place is dramatic. It is clear from discussions with Missouri stakeholders that establishing these mechanisms has enabled affected utilities to initiate and fund large portfolios of customer energy efficiency programs.

Ameren Missouri's recent history with energy efficiency program funding well illustrates the dramatic impact 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 of 2009–2011. During this time Ameren Missouri received only program cost recovery—no lost revenue recovery or shareholder incentive amounts. Ameren Missouri executives viewed this business model for

energy efficiency as unsustainable. As a result Ameren Missouri "put on the brakes" to its programs and reduced its program funding from $30 million in 2011 to a bridge funding of $8 million in 2012. MEEIA had just passed in 2012, and Ameren Missouri sought to retain the basic foundations of its energy efficiency programs in place in anticipation of getting regulatory treatment of costs and incentives to allow it to return to a much higher level of investment. With the commission's approval of its DSIM, Ameren Missouri's planned investment did indeed jump—up to $35 million in 2013, $45 million in 2014, and as much as $65 million in 2015. As viewed by the director of Ameren Missouri's programs, accounting for all three legs of the financial stool "had a profound impact on Ameren Missouri's investments in energy efficiency." A clean energy advocate echoed this conclusion, commenting that such action "definitely changed Ameren Missouri's behavior" regarding its energy efficiency programs.

As noted earlier, MEEIA does not require utilities to fund and provide energy efficiency programs. They are voluntary. Consequently, there needed to be incentives for the utilities to engage fully and provide energy efficiency programs and services. To date, three out of 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 a MEEIA filing in late 2013.

Evaluation

MEEIA established guidelines and specific requirements for EM&V. Determination of the performance incentive is based on ex-post program evaluations. Consequently, annual impact evaluations are required to determine net energy and demand savings.

Process

The performance incentives are determined from the savings impacts as quantified from program evaluations completed by independent third-party contractors for the utilities. The Public Service Commission of Missouri contracts with an evaluation auditor to review the evaluations completed by the utilities' contractors in order to help ensure their accuracy. The parties filed a stipulation and agreement on February 11, 2015, to settle all issues related to final EM&V for 2013 and to put into place a process to address EM&V issues for 2014 and 2015.

Commission staff commented that the learning curve is very steep for utility energy efficiency programs; it is taking time for all parties involved to work through the processes and issues associated with the development, implementation, and evaluation of programs, including determination of utility incentives.

Looking Ahead

The rules established for MEEIA are undergoing a required review that began 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 remains about the same as the existing three-year MEEIA program plan, but expected savings are about half.

Missouri's DSIMs in place are too new to be able to assess their full impact and effectiveness. It is clear that having these in place has been a catalyst for Missouri's electric utilities to move ahead with portfolios of customer energy efficiency programs representing significant utility investment.

While more time and analysis will be needed before a full assessment of the effectiveness of Missouri's DSIMs have been, it already is clear, in the words of one Missouri observer, that having mechanisms in place to address the utility business model "has been effective in moving the need in a positive direction in a state where there had been no incentives for utility energy efficiency."

OKLAHOMA

Background

Utility performance incentives for energy efficiency programs were first approved in Oklahoma for Public Service Company of Oklahoma (PSO) in 2008.[37] The incentive structure approved for PSO was a shared savings approach that allowed PSO to recover 25% of the net benefits for those programs that achieve measurable benefits. The total resource cost test was to be used in calculating the net benefits of the programs. The mechanism also allowed PSO to recover 15% of program costs as an incentive for programs in which savings cannot be determined. The projected savings benefit was then trued up to the actual savings benefit following completion of the program year.

Oklahoma Gas and Electric (OGE) was first approved to receive performance incentives in 2009.[38] OGE's approved performance incentive structure was similar to the PSO approved shared benefit structure. However the OGE performance incentive was limited to 15% of the net shared benefits for eligible programs with a TRC score higher than 1.0 and capped at $2.7 million in the first year. OGE's request to earn a performance incentive on education programs was denied by the Oklahoma Corporate Commission (OCC).[39] As part of the settlement agreement approved by the OCC, OGE was also allowed to earn an incentive of 15% of program costs on programs that scored less than 1.0 on the TRC test.

In 2012, the OCC approved a settlement agreement for PSO to continue offering demand response and energy efficiency programs for an additional three years. The settlement agreement contained a reduced performance incentive for PSO, allowing the company to recover 15% of shared benefits instead of the previously approved 25%. The settlement agreement also allowed PSO to recover an incentive of 15% of program costs on education programs.

---

[37] Cause No. 200700449. Order No. 555302 issued June 13, 2008.

[38] Cause No. 200900200. Order No. 573419 issued January 21, 2010.

[39] Education programs represented 7.5% of the total DSM program budgets and included home energy reports.

In 2012, OGE received approval from OCC to offer programs for 2013-2015.[40] As part of the approved settlement agreement, OGE is allowed to continue the approved performance incentive structure from Cause No. 200900200. For the new three-year program cycle, OGE added two programs focused on decreasing peak demand, the SmartHours program and integrated volt var control (IVVC). These two programs are not eligible for any performance incentives.

In 2010, Oklahoma Natural Gas and CenterPoint Energy Resources received authorization to offer efficiency programs.[41] As part of this authorization, both companies received approval to collect a performance incentive of 15% of the net benefits for programs passing the TRC. The mechanism was similar to electric program performance incentives at the time. An incentive of 15% of the net benefits was awarded for programs passing the TRC and 15% of program costs for programs not passing the TRC. Program budgets for both companies were fixed for proposed three-year cycles.

Other Relevant Regulatory Features

Oklahoma does not have an energy efficiency resource standard at this time. The OCC also has yet to approve decoupling for any electric utility in the state.

Policy Details

The details of the current performance incentives for OGE and PSO are detailed in table A12 below. Both current incentive structures were approved by the OCC in 2012. Both companies collect a projected shared savings incentive and then true up the results following the end of the program year. The shared savings mechanisms for PSO and OGE are similar but have significant differences. For example, while PSO and OGE both collect 15% of the net benefits of energy efficiency programs, the net benefits are calculated in different ways. OGE calculates the incentive as 15% of the net benefits of the total resource cost test for programs with a score over 1.0. PSO calculates net benefits using the Program Administrator Cost Test. This difference allows PSO to collect a higher level of incentives because the costs included in the total resource cost test are greater than the costs included in the Program Administrator Cost Test. Both companies collect 15% of program costs for programs failing to meet a 1.0 score on the PACT or TRC. PSO also collects an incentive on demand response programs while OGE does not. Finally, PSO collects an incentive of 15% of program costs for education programs while OGE does not.

Outcomes

Table A12 outlines recent performance for electric utilities in Oklahoma and the associated incentives.

---

[40] Cause No. 201200134. Order No. 605737 issued December 20, 2012.

[41] Cause Nos. 201000143 and 201000148. Order Nos. 585366 issued May 12, 2010 and 583869 issued March 25, 2011.

Table A12. OGE and PSO recent performance

Year	Program cost	Annual savings (MWh)	Performance incentive	Percentage of total program costs
Oklahoma Gas and Electric				
2011	$18,200,806	64,743	$3,105,699	17%
2012	$14,662,068	34,406	$2,609,501	18%
Public Service Company of Oklahoma				
2012	$21,963,690	75,629	$5,526,804	25%
2013	$22,335,179	67,901	$4,691,690	21%

Source: Oklahoma Corporate Commission

The data show utilities have performed well in regard to offering cost-effective programs with sizable net benefits. However it should be noted the incentives are calculated differently for OGE and PSO, thereby making direct comparisons between the two companies difficult. It is also important to note that the true-up data for companies in Oklahoma is not filed publicly, making it difficult to determine how actual results and spending compare with projected results and spending.

Figure A10 illustrates the increase in Oklahoma electric energy efficiency program savings.

Figure A10. Oklahoma Energy Savings 2006–2013. *Source:* ACEEE 2014 *State Scorecard.*

Discussion

Oklahoma has a very favorable performance incentive policy in place for electric and gas utilities. The shared savings approach has allowed utilities in Oklahoma to earn as much as 25% of total program costs as an incentive since the inception of the policy. The general

72

consensus of stakeholders interviewed by ACEEE is that the policy has been effective in encouraging utilities to achieve greater energy efficiency savings. Some stakeholders expressed happiness with the progress made in Oklahoma but stated that the utilities could be achieving much greater savings and would be doing so if the state had an energy efficiency resource standard. Other stakeholders expressed concern that without the incentive policy in place, it is unlikely the utilities would offer any programs at all.

Looking Forward

The performance incentive structure in Oklahoma will be modified following the current three-year program plans (2015). The changes are a result of a 2013 rulemaking proceeding to modify several aspects of gas and electric utility rules. Beginning in 2015, utilities will only be allowed to collect an incentive if the portfolio achieves 80% of the individual utility's goal and the portfolio has a TRC score higher than 1.0. Utilities will still be able to earn an incentive on programs with a TRC result of less than 1.0, but only if the portfolio as a whole passes the test. If savings beyond 100% of the utility savings goal are achieved, 15% of net benefits will be paid. The rule is not explicit in a maximum threshold for the total incentive, only the minimum. Finally, the new rule does not have explicit penalties but does have language giving the commission the ability to reduce the incentive if the utility exceeds spending targets. The new changes are expected to simplify the process and level the playing field as all utilities will have the opportunity to earn the same incentive.

RHODE ISLAND

Background

Rhode Island has had performance incentives in place for Narragansett Electric Company (National Grid) since 1990. The electric performance incentive has changed over time. Initially, the Rhode Island Public Utility Commission (RIPUC) allowed National Grid to earn a total 4.25% of the energy efficiency budget, excluding evaluation costs. The company was required to reach 45% of the targeted annual energy savings goal for a specific sector to begin earning a performance incentive. In 2004, the RIPUC approved changes to the mechanism to increase the allowed incentive from 4.25% to 4.4% of eligible program costs. [42] In addition to the energy savings goal, National Grid was also allowed to earn an incentive for achieving goals in five performance metric categories for specific programs. The threshold to earn the incentive for each sector was also increased from 45% to 60%.

In 2007, RIPUC also approved a performance incentive for National Grid's gas efficiency programs. The target incentive rate was 4.4% of eligible program costs, just as it was for electric programs. The threshold and maximum incentive structure were also the same as the electric model. The sector categories for incentives for natural gas energy efficiency performance were initially residential and commercial and industrial (C&I). The savings targets are measured in annual MMBtu.

In 2009, the sectors for which the incentive targets are measured for electric performance incentives were changed from residential, small C&I, and large C&I to low-income residential, non-low-income residential, and large C&I. The gas incentive sectors were also

---

[42] See Rhode Island Public Service Commission Order 18152.

changed by splitting the residential sector into low-income residential and non-low-income residential. Also in 2009, a provision was introduced to adjust the goals for efficiency in actual spending relative to budget in the achievement of savings goals. In 2010, the performance metric incentives for five separate categories related to specific programs were eliminated to simplify awarding the incentive. In 2012, the gas and electric performance incentive underwent significant changes as the savings target incentive rate was increased to 5% and the threshold to earn the incentive was increased from 60% to 75%. In the company's settlement agreement for 2015, additional changes were made, as described in the section on looking ahead.

Other Relevant Regulatory Features

The Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006 requires utilities to acquire all cost-effective energy efficiency.[43] The act also establishes requirements for strategic long-term planning and purchasing of least-cost supply and demand resources, and three-year energy saving targets. The energy savings targets are proposed by the Rhode Island Energy Efficiency and Resources Management Council. High-level strategies and illustrative budgets to reach those targets are developed in three-year plans filed by National Grid. Within the three-year plan time frame, National Grid then files annual plans containing detailed goals, budgets, and program plans for PUC approval. Revenue decoupling is also fully implemented by National Grid electric and gas in Rhode Island.

Policy Details

As of 2014, the company may earn a target-based incentive rate equal to 5% of the eligible spending budget in a program year for achieving electric and gas energy savings goals. The incentive mechanism establishes an incentive of 1.25% of the annual budget for achieving 75% of the savings goals in a sector. This increases linearly to 5% of the annual budget for achievement of 100%, and increase linearly from that point to 6.25% of the annual budget for achieving 125% of the savings goals. The company must achieve at least 75% of the targeted performance to begin earning any incentive. Figure A11 illustrates the current incentive mechanism and how it differs from the 2012 mechanism.

---

[43] http://www.ripuc.org/eventsactions/docket/3759-RIAct.pdf
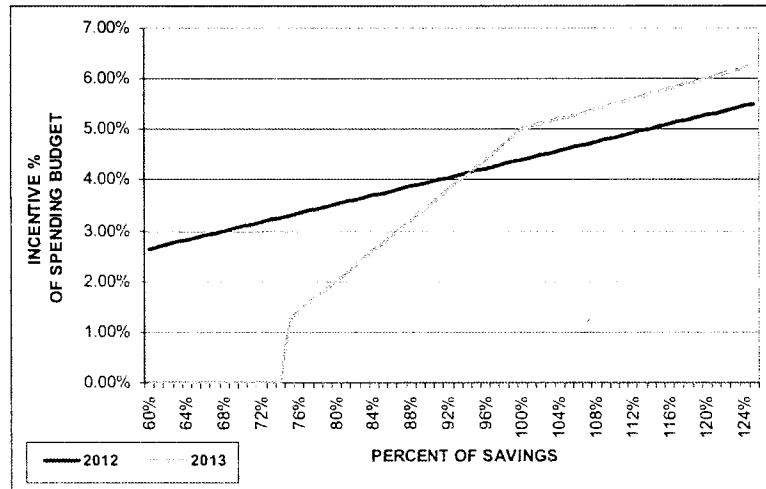
Figure A11. Shareholder incentive mechanism, 2012 and 2013. *Source:* National Grid 2013 EE Plan Docket No. 4366, page 24.

Outcomes

Table A13 details program spending, savings, and performance incentives earned since 2010 for electric and gas programs.

Table A13. Rhode Island performance incentives, 2010–2013

Year	Program cost	Annual savings	Incentive amounts	Percentage of incentive target*
Electric (MWh)				
2010	$23,747,710	81,275	$1,333,996	107.1%
2011	$32,972,679	96,009	$1,929,273	93.5%
2012	$45,768,146	119,666	$2,469,411	93.%
2013	$62,372,290	157,121	$2,997,681	98.9%
Gas (MMBtu)				
2010	$5,197,448	140,097	$231,310	126.8%
2011	$4,518,069	119,613	$239,863	117%
2012	$12,554,591	229,811	$586,036	99.2%
2013	$17,925,668	312,433	$968,229	108.6%

* The value in this column represents the total percentage of incentive target met. However the incentive is actually calculated at the sector level, and the company must meet sector-level thresholds to earn the incentive for each sector. *Source:* Rhode Island Public Service Commission.

The data show that the electric and gas programs have routinely performed within the bounds of 90% to 125% of the savings targets. It is also worth noting that the 2013 electric program performance increased following an increase in the target incentive rate following two years of declining performance.

75

Figure A12 illustrates the increase in Rhode Island electric energy efficiency program savings.
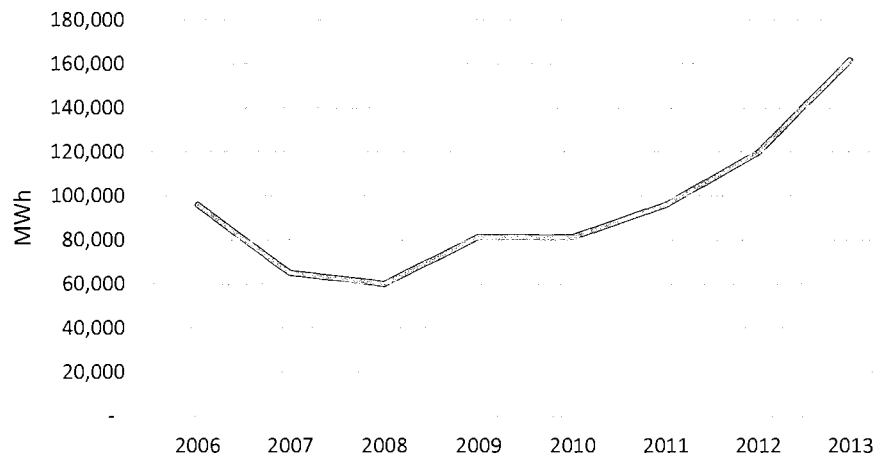
Figure A12. Rhode Island energy savings, 2006–2013. *Source:* 2014 *State Scorecard.*

Discussion

The unanimous response from the interviews conducted by ACEEE staff was that incentives have been effective in encouraging National Grid to achieve greater results with its energy efficiency programs. One of the strengths of the Rhode Island performance incentive mechanism is that the stakeholders have the opportunity to propose modifications to the incentive structure annually.[44] This allows for a nimble incentive that can change as circumstances change. For example, program performance declined in 2011 and 2012 as National Grid struggled to spend approved budgets and meet savings goals during a period of aggressive program ramping up and corporate restructuring. After the second straight year of performance below goals, the stakeholder group and National Grid agreed to increase the 4.4% award to 5% of the eligible program costs for achievement of 100% of the energy savings goals (with a maximum threshold of 125% for a 6.25% incentive). Since the change in incentive level, however, National Grid has stabilized its energy efficiency delivery efforts. At the same time, the minimum threshold was increased from 60% to 75% of performance targets to begin earning an incentive. This change has seemed to achieve the desired effect as program spending and performance increased to pre-2011 levels in 2013. The mechanism has served to focus utility attention on achieving their goals.

Looking Forward

The 2013–2014 winter was colder than average, and high natural gas demand caused significantly higher spot market prices. The result of these conditions is very high peak energy prices. To reduce peak demand and thus avoid higher prices, the stakeholder group

---

[44] While the stakeholder process can propose changes to the incentive mechanism and other aspects of National Grid's program plan, ultimately any modifications must be approved by the RIPUC.

and National Grid agreed upon a demand-reduction incentive. This incentive was designed and agreed upon to increase demand reduction in the summer and provide an increased focus on demand reduction throughout the year. This proposal, introduced as part of the 2015 Energy Efficiency Program Plan, was approved by the RIPUC.

The newly designed performance incentive only applies to electric program budgets. In order to promote the achievement of demand savings goals, the company proposes to set aside 30% of the current incentive to be available for the achievement of summer annual MW savings goals. This would allow the company to earn a target-based incentive rate equal to 3.5% of the eligible annual budget for achieving MWh savings goals and 1.5% of the annual spending budget for achieving MW savings goals.

TEXAS

Background

Texas first established a performance incentive mechanism for electric utilities in 2008. The performance incentive, or bonus as it is referred to in Texas, allowed electric utilities to earn 1% of net benefits for every 2% of a company's goal that it exceeded. In an effort to limit disproportionately high bonuses, the Public Utility Commission of Texas (PUCT) capped the bonus not to exceed 20% of total program costs for each utility. The established threshold for a utility to earn a bonus was 100% of the demand and energy goals as defined in Texas law. Net benefits were calculated by subtracting the net present value of the avoided cost of energy and capacity from the program costs. Program costs included all incentives and administrative and program evaluation costs. Demand and energy savings were gross values; that is, they are not adjusted for naturally occurring savings or free riders.[45] The rule also allowed utilities to earn an additional bonus for achieving at least 120% of its demand reduction goal with at least 10% of its savings met through hard-to-reach programs. This additional bonus was equal to 10% of the first bonus. Hard-to-reach programs were designed to target residential customers with an annual household income at or below 200% of the federal poverty guidelines.

The performance bonus was modified in 2011. Previously, a utility was awarded a bonus of 1% of net benefits for every 2% a company exceeded its goals, up to 20% of total program costs. This was modified to limit the bonus to 10% of net benefits instead of 20% of total program costs. This change has created the possibility for utilities to earn much more than 20% of program cost as a performance incentive. Companies in 2012 earned between 10% and 31% of total program costs as a performance incentive. In 2013, companies were earning between 31% and 46% of program costs as a performance incentive. The change was instituted to encourage utilities to achieve savings with greater net benefits.[46] The 2011 changes eliminated the additional bonus incentive previously awarded to utilities achieving

---

[45] Performance incentives first established in Order Adopting the Repeal of §25.181 and §25.184 and of new §25.181 as Approved at the March 26, 2008 Open Meeting. Project No. 33487.

[46] Modifications approved in Order Adopting Amendments to §25.181 as Approved at the September 28, 2012 Open Meeting.

120% of its demand reduction goal with at least 10% of its savings met through hard-to-reach programs.

Other Relevant Regulatory Features

Texas was the first state to adopt an Energy Efficiency Resource Standard in 1999. Currently, the annual goals mandate a 30% reduction of annual growth in demand for residential and commercial customers. However the structure of the goal allows a utility to meet the goals by reducing demand by 0.4% of its summer-weather-adjusted peak demand for the previous year. Texas does not currently allow electric utilities full decoupling or lost revenue recovery for offering energy efficiency programs.

Policy Details

Electric utilities may earn performance bonuses for achieving 100% of demand and energy savings targets prescribed in Texas law. The demand and energy goals require utilities to reduce annual growth in demand for residential and commercial customers by 30% for the previous year. If a 30% reduction is equivalent to at least 0.4% of summer-weather-adjusted peak demand for the combined residential and commercial customers for the previous year, 0.4% becomes the new goal.[47] Once a utility exceeds 100% of the approved goal and does not exceed spending limits, the utility will earn 1% of the net benefits for every 2% the goal is exceeded, with a maximum of 10% of the utility's total net benefits. Utilities must also spend at least 5% of the program budget on hard-to-reach savings to be eligible for a bonus.

Outcomes

Table A14 contains the aggregate results for energy efficiency programs and performance bonuses since 2008. Data were collected for all 10 electric utilities operating programs and receiving performance bonuses.

Table A14. Texas energy efficiency results and performance bonus, 2008-2013

Year	Total energy efficiency expenditures	Demand savings (MW)	Energy savings (GWh)	Performance bonus	Bonus as percentage of total expenditures
2008	$96,127,475	202	580	$19,238,502	20.01%
2009	$105,809,802	240	560	$21,148,220	19.99%
2010	$105,290,918	301	533	$20,432,317	19.41%
2011	$113,911,740	270	529	$21,487,140	18.86%
2012	$119,834,458	402	288	$28,736,107	23.98%
2013	$138,715,805	415	548	$53,678,151	38.70%

Source: Utility annual energy efficiency reports filed in Project Nos. 42264, 41196, 40194, 39105, and 37982

---

[47] §25.181−15. The establishment of demand and energy goals is far more complicated than described in this case study. For the purpose of brevity and focus on performance incentives, a detailed discussion of energy and demand goal setting has been withheld.

Utilities in Texas have rarely failed to earn an annual performance bonus since the policy began in 2008. Demand savings have increased annually, with the only exception being a slight drop in 2011. Following the modest decline in 2011, demand savings have increased to over 415 MW in 2013, almost as big as a typical power plant. Energy savings have experienced a decline since the 2008, with a notable drop in 2012. With modest goals, however, most utilities exceed annual energy savings goals necessary to earn performance bonuses.

Figure A13 depicts the results.
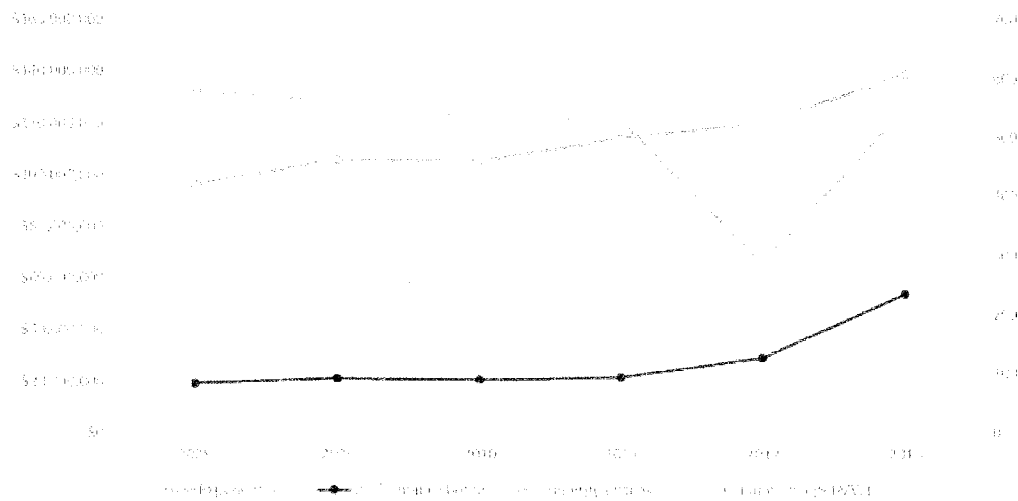
Figure A13. Texas energy efficiency results and performance bonus, 2008-2013. *Source:* Utility annual energy efficiency reports filed in Project Nos. 42264, 41196, 40194, 39105, and 37982.

Discussion

The performance bonus mechanism has been partially influential in increasing demand savings but has had a questionable effect on energy savings. Energy savings have declined since 2008, the year the performance bonus was first authorized. Demand savings have more than doubled during this same time and have increased markedly since 2011. While there were changes to the performance incentives structure at this time, the increase in demand savings can be attributed to the PUCT request to increase demand reductions from load management programs. However most utilities have exceeded energy savings targets since 2008. The spike in demand reduction performance coincided with the change in the performance incentive structure in 2011. Also in 2011, the Texas legislature adopted Senate Bill 1125 that modified the energy efficiency goal structure to include a peak demand component.

Many companies performed at levels significantly beyond goals and the maximum incentive level. As an example, Southwestern Electric Power Company met 194% of its energy goal and 238% of its demand goal in 2012. The calculated performance incentive for this level of achievement was $8,060,397. However SWEPCo only earned the maximum bonus based on 10% of net benefits, or $1,168,476. Many Texas utilities in 2012 and 2013 filed similar bonus calculations collecting a much lower bonus due to limits than what

would have been potentially available. In 2013, AEP Texas Central Company calculated a performance bonus of $38,212,549 but only collected $4,459,958, the maximum allowed as 10% of net benefits.

As the data above show, the performance incentives in Texas are substantial, exceeding 38% of program cost in 2013 in aggregate. The performance incentives in Texas are based on a net benefits approach. Net benefits are results of calculations based on the avoided cost of energy. The avoided cost of energy in Texas is updated annually. The frequent updates can have significant impacts on the calculation of net benefits and the performance incentive. In 2012, the avoided cost of energy was 6.4 cents per kWh. In 2013, the value increased to 10.4 cents per kWh but then declined to 4.6 cents per kWh in 2014. Large changes in avoided cost in Texas explain part of the increase in performance incentives awarded in 2013 from 2012.

In comments filed in both Project No. 33487, the establishment of the performance bonus, and in Project No. 39674, the modifications to the limits of the performance bonus, commenters expressed concern with the level of incentives allowed. However Texas does not allow lost revenue recovery or have a decoupled rate structure. Many utilities view the incentive structure as a way to allow a company to earn part of the lost revenues associated with energy efficiency.

During PUCT rule-making proceedings to modify the performance incentives and energy efficiency goals, commenters have objected to the use of gross savings for goal attainment and performance bonus calculation.[48] The PUCT specifically requires the performance bonus to be calculated using demand or energy savings from programs implemented to obtain goals.[49] By definition, this would only include net savings, but utility filing projections and results are in gross savings terms. Evaluations in Texas do not include net-to-gross analysis, making it difficult to determine if utilities are earning incentives on savings not attributable to specific programs.

Looking Forward

Currently, there are no changes expected to the performance bonus mechanism in the near future. Changes to the mechanism have historically been initiated in the Texas legislature and worked through the PUCT rule-making process. In both of the major rule makings associated with the performance bonus, parties have actively participated in shaping the final rules. However, without legislative action, it is unlikely any changes will happen soon.

Table A15 shows energy demand goals and performance.

---

[48] See comments of Cities in Project No. 39674.

[49] §25.181(h): Energy Efficiency Performance Bonus.

Table A15. Texas energy and demand goals and performance, 2008–2013

Year	Demand goal (MW)	Demand savings (MW)	Percentage of goal met	Energy savings goal (GWh)	Energy savings (GWh)	Percentage of goal met
2008	117	202	172%	375	580	155%
2009	134	240	179%	403	560	139%
2010	142	301	212%	391	533	137%
2011	147	270	183%	400	529	132%
2012	152	402	265%	366	288	79%
2013	175	415	237%	442	548	124%

Source: Utility annual energy efficiency reports filed in Project Nos. 42264, 41196, 40194, 39105, and 37982

VERMONT

Background

Performance incentives have existed in Vermont since the inception of Efficiency Vermont in 1999. Efficiency Vermont is the statewide energy efficiency program operated by Vermont Energy Investment Corporation (VEIC). VEIC was initially contracted through the Vermont Public Service Board (VPSB) to serve as the energy efficiency service provider under a contract agreement but has operated as a jurisdictional regulated utility under a long-term 12-year Order of Appointment since 2010. When VEIC first contracted with the VPSB in 1999, the contract allowed VEIC to earn a percentage of program cost for meeting performance targets in specific areas over the course of a three-year program plan. The performance targets are known as quantifiable performance indicators (QPIs). The initial contract and agreements for subsequent three-year performance periods have allowed VEIC to earn between 3.4% and 4.3% of program costs as compensation (guaranteed return and a performance incentive). Since 1999 a percentage of this compensation was guaranteed and is known as an operations fee.

The remaining compensation is the performance incentive and is at risk. The performance incentive-based compensation can only be earned if VEIC meets the QPIs. The percentage of compensation allocated to the operation fee and performance incentive has fluctuated some between three-year performance periods. In the most recent performance period, 2015–2017, the operations fee is 40% and the performance incentive is 60% of total compensation. VEIC's QPIs and compensation structure are revisited and modified prior to every three-year cycle through the Demand Resource Plan (DRP) proceeding before the VPSB, with the most recent QPIs established for the 2015–2017 performance period in 2014.

For the 2015–2017 performance period, VEIC proposed an increase in the compensation rate from 4.1% to 6% (margin rate), and to equally distribute compensation on a 50–50 basis between the operations fee and performance incentive, as opposed to the current 40–60 split as recommended by the Public Service Department (PSD). VEIC had first recommended an

increase from 4.1% to 6%.[50] In addition, VEIC recommended the calculation method for the compensation rate continue to be based on a margin approach (used to set the compensation rate for the 2012–2014 performance period). The margin approach is based on the total percentage of compensation above cost, as opposed to a markup rate as a percentage of the total program cost as recommended by the PSD. The VPSB approved an increase to 4.5% on a markup basis (equating to a 4.3% margin rate) while maintaining a 40–60 split between guaranteed compensation and at-risk performance incentives.[51]

The City of Burlington Electric Department (BED) operates electric energy efficiency programs with established performance targets. BED's energy efficiency costs are recovered dollar for dollar at no additional cost to ratepayers (no operations fee or performance incentive). Vermont Gas Systems (VGS) also operates gas efficiency programs. As an incentive to operate programs, VGS is allowed to earn a rate of return on efficiency investments. The rate of return VGS earns on efficiency investments is the same rate of return approved in the company's last rate case.

Other Relevant Regulatory Features

Vermont has a nontraditional energy efficiency resource standard. Vermont law requires energy efficiency budgets to be set at a level that would realize "all reasonably available, cost-effective energy efficiency." Every 3 years the DRP produces an annual electric budget and savings 20-year forecast. Vermont law required utilities in the state to perform least-cost integrated resource planning "to identify and evaluate on an ongoing basis, resources that will meet Vermont's energy service needs in accordance with the principles of least cost integrated planning, including efficiency, conservation and load management alternatives, wise use of renewable resources, and environmentally sound energy supply."[52] Resource planning requires comprehensive energy efficiency programs designed to acquire the full amount of cost-effective savings.[53] Vermont also encourages energy efficiency through innovative rate making including inclining block rates and decoupling approved for Green Mountain Power and Vermont Gas.

Policy Details

The current electric performance incentive allows VEIC to earn a percentage of total program costs as an incentive. The incentive amount earned is determined by VEIC's ability to meet specific targets and minimum requirements for 15 electric-efficiency and 4 thermal-energy-and-process-fuels (TEPF) QPIs. Each QPI focuses on different policy objectives of the statewide efficiency program.

Electric-efficiency QPIs 1-7 are positive incentives awarded to VEIC for meeting a target for specific tasks. For example, QPI 1 targets energy savings. VEIC can begin earning an

---

[50] VEIC April 6, 2014, compensation recommendation: http://psb.vermont.gov/docketsandprojects/eeu/drp2013.

[51] EEU-2013-01, Order Regarding Energy Efficiency Utility Budgets for Demand Resources Plan. Page 60. July 9, 2014.

[52] 30 VSA §202a(2).

[53] 30 VSA §218c(a)(2).

incentive when 90% of the target is reached. Reaching 100% of the target is known as a stretch goal because the targets for QPIs 1–4 are 20% higher than the expected results in these categories. VEIC is also able to earn an incentive for exceeding the target goal. For QPIs 1–4, there is no upper limit to this incentive, but it is capped at total incentive available ($4,442,682) for the three-year period.

Table A16 shows QPIs 1–7.

Table A16. Efficiency Vermont quantifiable performance indicator targets 1–7 for 2015–2017 program cycle

No.	QPI	Target	Cap	Threshold
1	Annual incremental savings	321,800 MWh	none	90%
2	Total resource benefits	$336,300,000	none	90%
3	Summer peak demand savings	41.3 MW	none	90%
4	Winter peak demand savings	53.7 MW	none	90%
5	Business comprehensiveness	11% increase in depth of savings	$196,000 or 5%	80%
6	Residential market transformation	42% of new homes above code	$117,000 or 3%	85%
7	Business market transformation	500 partners	$117,000 or 3%	80%

Source: Order in Case No. EEU-2013-01

QPIs 8–15 (table A17) set minimum performance levels for specific public policy objectives. If VEIC does not meet the minimum performance level, it can lose the opportunity to earn performance incentives earned in QPIs 1-7.

Table A17. Efficiency Vermont quantifiable performance indicator targets 8–15 for 2015–2017 program cycle

No.	QPI	Minimum requirement	Possible financial impact
8	Electric ratepayer equity	Benefit cost ratio greater than 1.2	$3,915,693
9	Residential ratepayer equity	Sector spending greater than $32,500,000	$614,825
10	Low-income ratepayer equity	Sector spending greater than $10,500,000	$614,825
11	Small business customer equity	2000 small business customers	$614,825
12	Geographic equity	Benefits goals for each geographic area	$204,942
13	Program implementation efficiency	Meet all schedule milestones	$68,314
14	Service quality	Achieve 92 or more metric points in the Service Quality and Reliability Plan	$150,000
15	Spending	103% of budgeted spending level	No limit

Source: Order in Case No. EEU-2013-01

VEIC has a total possible electric compensation of $6,526,155 for the 2015-2017 performance period. This figure includes $2,610,462 in guaranteed compensation (operations fee) and $3,915,693 at-risk. While VEIC is allowed a higher earning potential for some QPIs known as super stretch targets, the organization is not allowed to earn more than the total performance award incentive set aside.

Of the four TEPF QPIs, the first two have a positive performance award associated with target levels. The second two are minimum performance requirements, meaning if the requirements are not met, VEIC will lose the ability to lose all of the performance award associated with TEPF. VEIC has a total possible thermal compensation of $878,315 for the 2015-2017 performance period. This figure includes $351,326 in guaranteed compensation (operations fee) and $526,989 at risk.

Table A18 shows thermal efficiency initiatives.

Table A18. Vermont thermal efficiency incentives

No.	QPI	Goal	Possible award
1	Annual incremental MMBTu savings	100% = 246,000 MMBtu	$342,742
2	Residential single family comprehensiveness	Multi-component retrofit goal	$114,247
3	Residential sector spending	Greater than 62.5% of the total TEPF expenditures	If not met, opportunity to earn 10% of the 100% target level performance award is forfeited.
4	Low-income spending	Greater than 17% of the total TEPF expenditures	If not met, opportunity to earn 10% of the 100% target level performance award is forfeited.

Source: Order in Case No. EEU-2013-01

Outcomes

VEIC has been successful in earning a performance fee consistently throughout its tenure as the statewide program administrator. Table A19 shows VEIC performance for the two previous program cycles.

Table A19. VEIC performance 2006-2011

Period	Three-year budget	Three-year annual incremental net savings (MWh)	Operations fee	Performance fee	Total performance incentive
2009-2011	$95,274,004	292,406	$559,119	$2,693,748	$3,252,867
2006-2008	$66,179,500	287,442	$473,510	$2,347,510	$2,820,510

Source: End-of-cycle budget reports

In 2009-2011, VEIC outperformed expectations for some QPIs and earned a higher performance fee for these QPIs than what was originally expected. VEIC is also expected to

84

meet targets in all QPIs for the 2012–2014 time period to earn the full performance fee allowed.

Figure A14 illustrates Vermont annual electric energy efficiency program savings.
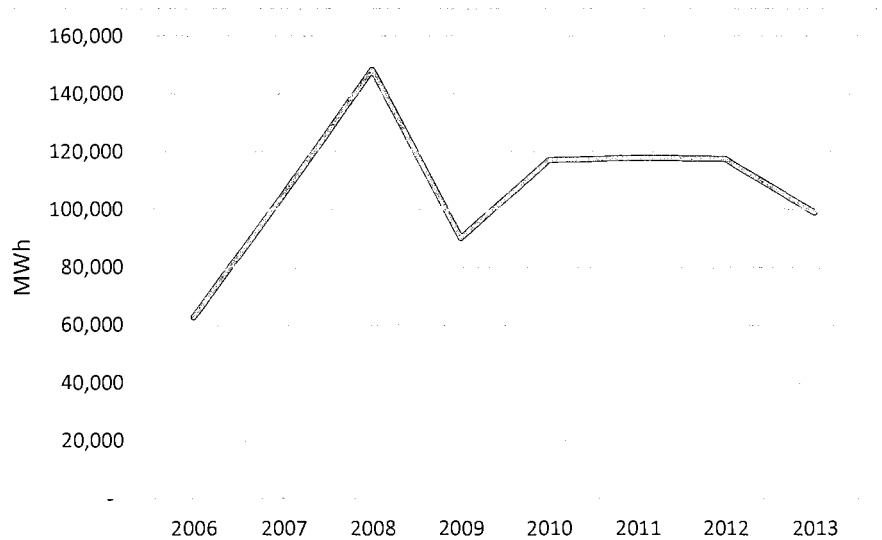
Figure A14. Vermont energy savings 2006–2013. *Source:* 2014 *State Scorecard.*

Discussion

The consensus among stakeholders interviewed in Vermont was that VEIC has done very well at balancing the goals contained in the QPI goal structure. VEIC's performance was recognized when it petitioned the VPSB to be the long-term statewide program administrator in Vermont. Subsequently, through a VPSB process, the company was awarded an 11-year order of appointment to continue working as the statewide administrator. Stakeholders also agreed the QPI structure provided a valuable mechanism to award VEIC for meeting specific policy objectives within the state. Instead of a traditional performance incentive awarding a company for meeting an energy or demand savings target, the QPI structure balances a suite of objectives and awards VEIC financially to ensure rate payer equity, spur market transformation, and achieve other state policy goals. In short, the structure is perceived as an effective mechanism for motivating performance Vermont.

Looking Forward

Under its order of appointment structure, VEIC will continue as the statewide program administrator in Vermont through 2021. Although small changes to the specific QPI and updates to the three-year performance period targets are expected, significant changes to the energy efficiency implementation structure are not expected in Vermont.

85

Appendix B. Questionnaire

Research Questionnaire: Financial Incentive Mechanism for Electric and Gas Utilities

The American Council for an Energy-Efficient Economy (ACEEE) is currently conducting national research on financial incentive mechanisms encouraging efficiency programs by utilities. We would greatly appreciate it if you would answer the following questions about the use of the utility-level shareholder incentive mechanism in your state. *Please note that ACEEE will report the information we gather as a general overall summary. We will not attribute specific answers or comments to specific individuals.* ACEEE will be happy to share the results of this research with the respondents to this survey.

Questions

Please answer the following questions about the financial incentive mechanism(s) in your state. Note that we leave space to answer the set of questions for up to two different incentive mechanisms. If different utilities have different types of incentive mechanisms, please answer the following items for each of two different utilities, beginning with the largest utility. If only one mechanism is used within the state, fill in all information under Mechanism One.

Mechanism One (e.g. for largest utility):

Applicable Utility(ies):

Indicate Mechanism Type (e.g. fixed incentive award, share of net benefits, performance-based incentive, increased rate of return, etc.):

1. When was it first authorized? When was the most recent version established?

2. Are there any threshold requirements that must be met to qualify for an incentive? If yes, what?

3. What is the overall incentive structure?

4. Is there a cap or ceiling on how much incentive can be earned? If yes, what?

5. Is the incentive payment based on net or gross savings?

6. Are there any related penalties? If yes, describe.

Please provide the following information for up to 2 utilities covered by Mechanism One (as described above) 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: _____
Program Year _____		
Actual earnings/award ($)		
Cost of energy efficiency programs to which incentive was applied ($)		
Total (1-year annual) energy savings achieved by the programs under the incentive mechanism (Please indicate kWh or therms)		
Program Year _____		
Actual earnings/award ($)		
Cost of energy efficiency programs to which incentive was applied ($)		
Total (1-year annual) energy savings achieved by the programs under the incentive mechanism (Please indicate kWh or therms)		

1. Please provide a citation or reference to the official documentation (e.g., statute, regulatory order, etc.) where this mechanism is established or described.

2. Is there a report, regulatory review, or other document that describes the mechanism and how it has worked in practice, 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.

3. How are efficiency savings achieved under the incentive mechanism measured and verified?

4. Are there any significant differences between the incentive mechanisms as applied to electric versus gas utilities?

Mechanism Two:

Applicable Utility(ies):

Indicate Mechanism Type (e.g. fixed incentive award, share of net benefits, performance-based incentive, increased rate of return, etc.):

1. When was it first authorized? When was the most recent version established?

2. Are there any threshold requirements that must be met to qualify for an incentive? If yes, what?

3. What is the overall incentive structure?

4. Is there a cap or ceiling on how much incentive can be earned? If yes, what?

5. Is the incentive payment based on net or gross savings?

6. Are there any related penalties? If yes, describe.

Please provide the following information for up to 2 utilities covered by Mechanism Two (as described above) 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:
Program Year _____		
Actual earnings/award ($)		
Cost of energy efficiency programs to which incentive was applied ($)		

Total (1-year annual) energy savings achieved by the programs under the incentive mechanism (Please indicate kWh or therms)		
Program Year _____		
Actual earnings/award ($)		
Cost of energy efficiency programs to which incentive was applied ($)		
Total (1-year annual) energy savings achieved by the programs under the incentive mechanism (Please indicate kWh or therms)		

1. Please provide a citation or reference to the official documentation (e.g., statute, regulatory order, etc.) where this mechanism is established or described.

2. Is there a report, regulatory review, or other document that describes the mechanism and how it has worked in practice, 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.

3. How are efficiency savings achieved under the mechanism measured and verified?

4. Are there any significant differences between the mechanisms as applied to electric versus gas utilities?

Overall Questions

We'd be interested in any thoughts you have on these last two questions. Again, we will NOT be quoting anyone by name.

1. Are there any suggestions you would make to another state who was thinking of adopting a utility energy efficiency performance incentive such as the mechanism(s) used in your state?

2. Please provide any additional insights or important information about efficiency incentives for utilities in your state that we have not covered above.

If you have any questions or comments about this survey, please contact Seth Nowak at the American Council for an Energy-Efficient Economy at (608)256-9155 or snowak@aceee.org

---

Please provide your preferred contact information:

Name _____

State_____

Phone_____

Email_____

THANK YOU VERY MUCH FOR YOUR ASSISTANCE!

Appendix C. Incentive Amounts as Percentage of Energy Efficiency Costs

Table C1. Incentive amounts relative to total costs by mechanism type by utility/administrator, state, and year

Net benefits		Multifactor		Savings-based	
Xcel electric (MN) 2011	68%	NSTAR (MA) 2013	6%	Consumers 2012 (MI)	15%
Xcel electric (MN) 2012	62%	NGRID (MA) 2013	6%	Consumers 2013 (MI)	15%
Otter Tail Power (MN) 2011	60%	NGRID (MA) 2012	6%	DTE Energy 2012 (MI)	15%
Georgia Power 2013	58%	Efficiency VT 2008	4%	DTE Energy 2013 (MI)	15%
Otter Tail Power (MN) 2012	56%	Efficiency VT 2011	3%	IPL (IN) 2013	8%
Georgia Power 2012	42%	PBFA (HI) 2014	2%	PSNH 2013	8%
AEP Texas Central 2013	36%	PBFA (HI) 2013	2%	PSNH 2012	9%
Xcel Energy (CO) 2012	29%	DC SEU 2012	1%	CT UI 2013	6%
SWEPCO (TX) 2012	26%	DC SEU 2013	1%	CT CL&P 2013	7%
PSO (OK) 2012	25%	WI FOE 2010-14	0.2%	CT UI 2012	6%
Xcel Energy (CO) 2013	22%			CT CL&P 2012	7%
PSO (OK) 2013	21%			RI NGRID 2013	5%
DEC (SC) 2014	18%			RI NGRID 2012	5%
OGE (OK) 2012	18%			NY all IOUs	4%
DEC (SC) 2013	18%				
OGE (OK) 2011	17%				
APS (AZ) 2012	14%				
SCE&G 2013	14%				
APS (AZ) 2013	9%				
SWEPCO AR	8%				
SWEPCO AR	8%				
Entergy Arkansas 2013	7%				
Entergy Arkansas 2012	6%				
SCE&G 2014	6%				

Source: Questionnaires completed by state commission staff

Exhibit NM-15

I&M Discovery Request Response to CAC Set 1, Q2, WP 2016 EECO kWh Forecast Tab

2016 EECO Forecasted Savings

GIS Circuit id value	Station_Name	Circuit Name	Tot Custs	Tot kWh	Res custs	Res kWh	Com custs	Com kWh	Ind custs	Ind kWh	Res Lightin	Com Lightin	Com Lighting k	Ind Lighting cust	Ind Lighting k	Street Ligh	Street Lighting kWh
4050321	SOUTH BEND	NO 1	2,110	41,345,565	1,864	15,898,868	244	25,008,244	2	328,000	25,781	14	64,535	0	0	3	20,136
4050322	SOUTH BEND	NO 2	1,871	27,496,360	1,717	15,248,883	154	12,181,331	0	0	20,325	17	45,821	0	0	0	0
4050323	SOUTH BEND	NO 3	1,386	20,585,562	1,252	11,977,678	134	8,545,852	0	0	11,701	4	11,728	0	0	2	38,603
4093121	EAST SIDE	Park Jeff	1,016	9,620,876	956	8,142,559	60	1,419,368	0	0	3,211	12	55,738	0	0	0	0
4093122	EAST SIDE	Ironwood	2,366	29,092,302	2,268	18,579,789	98	10,430,783	0	0	33,512	14	29,922	0	0	3	18,296
4093123	EAST SIDE	Adams	2,109	31,257,009	1,945	18,104,939	158	10,622,145	6	2,358,755	32,029	21	42,137	0	0	7	97,004
4093124	EAST SIDE	Wilson	1,915	24,016,643	1,844	17,380,044	71	6,520,440	0	0	55,847	7	32,524	0	0	3	27,789
4093125	EAST SIDE	Hastings	2,401	24,151,770	2,210	19,127,395	188	4,815,248	3	47,508	57,710	10	11,118	2	3,036	3	89,754
4093126	EAST SIDE	IUSB	221	17,149,912	175	1,702,872	46	15,357,836	0	0	3,180	5	4,690	0	0	4	81,334
4923321	SPY RUN	Three Rivers	1,476	23,831,756	1,238	9,104,060	227	13,983,100	11	679,504	5,324	29	58,138	0	0	1	1,629
4923322	SPY RUN	Centlivre	431	54,168,068	380	2,709,161	49	4,394,059	2	47,049,236	1,348	7	7,608	2	6,656	0	0
4928821	HARPER	Tanglewood	1,399	34,963,415	1,197	11,460,267	187	5,920,475	15	17,248,659	16,880	22	38,176	0	0	10	278,958
4928822	HARPER	Minich	2,066	39,833,091	1,881	22,718,342	179	15,843,624	6	894,777	22,378	28	119,356	2	3,012	8	231,602
4933521	HACIENDA	Goeglein	1,447	18,019,642	1,380	14,606,257	65	3,346,087	2	37,986	12,505	1	476	0	0	9	16,331
4933523	HACIENDA	Maplewood	1,571	18,964,536	1,515	17,158,890	56	1,758,241	0	0	12,224	8	31,989	0	0	2	3,193
4933524	HACIENDA	Arlington	1,530	19,750,112	1,506	18,746,337	24	902,467	0	0	2,311	0	0	0	0	17	98,997
4935221	GRABILL	Sheller	504	19,695,861	394	4,167,306	85	3,882,837	25	11,613,572	3,740	10	17,509	2	7,036	1	3,861
4935222	GRABILL	Page	2,340	44,476,940	2,056	31,525,916	278	12,187,766	6	681,815	35,569	18	27,130	1	1,012	13	17,731
4938121	ELCONA	#1	69	26,400,709	0	0	27	1,495,014	42	24,784,064	0	3	3,363	6	118,268	0	0
4938122	ELCONA	#2	107	23,053,598	61	718,515	32	1,609,699	14	20,718,234	1,398	2	3,728	1	2,024	0	0
4938123	ELCONA	Country Club	1,990	48,600,092	1,753	16,798,886	191	9,302,218	46	22,276,208	12,904	10	44,751	6	28,204	7	136,920

Average Distribution Circuit Loss Factor Adjustment	Estimated CVR Factor	Target Annual Operation*	Voltage Reduction Target
1.0672	0.950	70%	2.5%

*Note: Includes VVO Off Days Required for EM&V energy and demand savings analysis

		End Use (at the meter) Consumption Baseline (kWh)							Operational	Operational
		Data							Status	1.1.2016
Station_Name	Circuit Name	Res custs	Com custs	Ind custs	Res kWh	Com kWh	Ind kWh	Tot kWh		VVO Est. Savings
EAST SIDE		9,398	621	9	83,037,598	49,165,819	2,406,263	135,288,512	Operational	2,400,316
ELCONA		1,814	250	102	17,517,401	12,406,931	67,778,506	98,054,398	Operational	1,739,701
GRABILL		2,450	363	31	35,693,222	16,070,603	12,295,387	64,172,800	11.15.15	1,138,567
HACIENDA		4,401	145	2	50,511,484	6,006,794	37,986	56,734,291	Operational	1,006,591
HARPER		3,078	366	21	34,178,609	21,764,100	18,143,436	74,796,506	9.15.2015	1,327,055
SOUTH BEND		4,833	532	2	43,125,429	45,735,426	328,000	89,427,487	Operational	1,586,640
SPY RUN		1,618	276	13	11,813,221	18,377,159	47,728,740	77,999,824	10.1.2015	1,383,888
Grand Total		27,592	2553	180	275,876,964	169,526,833	148,718,318	596,473,818		10,582,758
										10,582,758

				Demand Savings (kW)		
Station	Station Transformer #	Peak Demand- at the Station	Peak Demand Reduction- at the Station (kW)			
East Side	#1	20,110	478			
East Side	#2	19,730	469			
Elcona	#1	24,200	575			
Grabill	#1	16,600	394			
Hacienda	#1	17,700	420			
Harper	#1	17,160	408			
South Bend	#4	22,130	526			
Spy Run	#4	16,020	380			
Hacienda	#2	23,270	582			
Lincoln	#1	21,450	536			
State Street	#1	19,780	495			
Total			5,263			

Station_Name	Total_kWh	VVO Est. Savings
HACIENDA	78,527,112	1,393,244
LINCOLN	78,011,660	1,384,098
STATE STREET	77,528,047	1,375,518
Grand Total	234,066,819	4,152,860

Station	Residential Customers	Commercial Customers	Industrial Customers	Total Customers
Hacienda	4,451	407	0	4,858
Lincoln	3,310	612	25	3,947
State Street	4,083	428	3	4,514
Total	11,844	1,447	28	13,319

1.77%

1.77%

I&M Indiana VVO 2016	
2016 Estimated kWh Savings	2016 Estimated kW Savings
14,735,618	5,263

Allocations based on # customers

90%	Residential
10%	C&I
100%	Check

	2016 Deployment I and Deployment II
Source Cause 43827 DSM 5 Attachment JLB-2	Allocation--# Customers

Total 2016 Carry Charge	Total 2016 Depreciation	Total 2016 Carry Charge & Depreciation			$585,436	Res	90%
$485,929	$161,976	$647,905			$62,469	C&I	10%

Incremental O&M--See breakout below	
2016 O&M	$255,000

Total O&M, EM&V, Staffing
$390,885

Total 2016 Pgm Cost	$1,038,790
Residential	$938,634
C&I	$100,156

EM&V (% of Capital Cost)	
2016 EM&V	$75,000

I&M IN DSM Staff Fully Loaded Labor per year	$135,000
Labor Allocation to EECO	0.451
EECO DSM Labor	$60,885

2016 Benefit Cost Estimate (TRC/UCT)
1.7

O&M Detail		25 Ckts	9 Ckts		
Operations Engine	0.25	$100,000	$25,000	$9,000	AEPSC Incremental
M&V Engineer	0.25	$100,000	$25,000	$9,000	AEPSC Incremental
MRO Technician	0.25	$80,000	$20,000	$7,200	I&M Incremental
IT Field Ops Techn	0.25	$80,000	$20,000	$7,200	AEPSC Incremental
Distibution Engine	0.1	$100,000	$10,000	$3,600	AEPSC Incremental
Line Crew	0.291666667	$300,000	$87,500	$31,500	I&M Incremental
Total On going O&M			$187,500	$67,500	
Total Capital			$6,250,000	$2,250,000	
% On going O&M required for Capital			3.00%	3.00%	
Total Engineering & Telecommunications			$80,000	$28,800	AEPSC Incremental
Total MRO & Line			$107,500	$38,700	I&M Incremental
			$255,000		

Exhibit NM-16

I&M Discovery Request Response to CAC Set 1, Q2, 2014 Final Spend

I&M Utility Operations
2014 Actuals by Month Indiana DSM_EE Program Year 5
Authorized / Control Budget Variance Report

			A	B	C	D	E	F	G H	I	J	K	L	M	N

| | | | | | 2014 Year-to-Date December / Year-End | | | | | | | | | | |

	Project	Expense Category	Forecast $	Actual $ (includes accruals)	ANNUAL Budget $s Remaining	2014 Authorized	January Actual $ (includes accruals)	February Actual $ (includes accruals)	March Actual $ (includes accruals)	April Actual $ (includes accruals)
7	000018501 IN-DSM Staff Devlpmnt & Mbrshp	Staffing	$0.00	$12,386.04	($12,386.04)	$0.00	$3,497.11	$2,838.22	$87.97	$82.22
8		Delivery	$95,000.00	$16,224.25	$78,775.75	$95,000.00	$0.00	$0.00	$0.00	$0.00
9		Other	$0.00	$5,985.08	($5,985.08)	$0.00	$408.42	$2,706.71	$963.05	$63.24
10		Sum:	$95,000.00	$34,595.37	$60,404.63	$95,000.00	$3,905.53	$5,544.93	$1,051.02	$145.46
11	000018502 IN-Information & Technlgy Syst	Staffing	$0.00	$2,817.88	($2,817.88)	$0.00	$0.00	$0.00	$0.00	$1,002.87
12		Delivery	$235,000.00	$123,270.11	$111,729.89	$235,000.00	$0.00	$0.00	$53,125.00	$0.00
13		Other	$0.00	$76.23	($76.23)	$0.00	$0.00	$0.00	$0.00	$73.89
14		Sum:	$235,000.00	$126,164.22	$108,835.78	$235,000.00	$0.00	$0.00	$53,125.00	$1,076.76
15	000018503 IN-DSM Marketing & Cust Aware	Staffing	$0.00	$14,984.14	($14,984.14)	$0.00	$627.22	$1,748.41	$3,347.48	$1,617.21
16		Delivery	$300,000.00	$179,633.03	$120,366.97	$300,000.00	$1,316.24	$661.18	$90,093.47	$16,763.72
17		Other	$0.00	$1,051.08	($1,051.08)	$0.00	$0.00	$0.00	$189.10	$512.57
18		Sum:	$300,000.00	$195,668.25	$104,331.75	$300,000.00	$1,943.46	$2,409.59	$93,630.05	$18,893.50
19	000018505 IN - Res Appliance Recycling	Staffing	$43,960.00	$22,074.64	$21,885.36	$43,960.00	$843.20	$1,887.51	$1,914.33	$1,609.49
20		Incentives	$112,989.00	$155,160.00	($42,171.00)	$112,989.00	$0.00	$7,560.00	$5,240.00	$6,200.00
21		Delivery	$395,463.00	$475,177.50	($79,714.50)	$395,463.00	$34,450.00	$10,965.50	$19,297.50	$39,299.50
22		EM&V	$112,467.00	$24,025.01	$88,441.99	$112,467.00	$800.00	$1,766.57	$8,274.11	$1,875.55
23		Other	$24,993.00	$483.97	$24,509.03	$24,993.00	$3.92	$0.00	$11.25	$4.71
24		Sum:	$689,872.00	$676,921.12	$12,950.88	$689,872.00	$36,097.12	$22,179.58	$34,737.19	$48,989.25
25	000019206 IN - C&I Incentive Program	Staffing	$50,835.00	$59,302.23	($8,467.23)	$50,835.00	$6,242.74	$3,797.53	$5,441.04	$5,160.93
26		Incentives	$950,691.00	$646,614.98	$304,076.02	$950,691.00	$0.00	$0.00	$0.00	$11,410.55
27		Delivery	$880,062.00	$960,321.75	($80,259.75)	$880,062.00	$99,245.00	$98,290.45	$100,250.00	$39,923.87
28		EM&V	$84,331.00	$136,283.76	($51,952.76)	$84,331.00	$14,000.00	$13,397.15	$53,952.05	$12,442.85
29		Other	$21,083.00	$1,052.34	$20,030.66	$21,083.00	$9.77	$0.00	$158.02	$18.04
30		Sum:	$1,987,002.00	$1,803,575.06	$183,426.94	$1,987,002.00	$119,497.51	$115,485.13	$159,801.11	$68,956.24
31	000020613 IN Statewide-Res Lighting	Staffing	$34,931.00	$15,953.75	$18,977.25	$34,931.00	$1,495.10	$2,026.39	$2,285.97	$1,697.57
32		Delivery	$1,440,111.00	$808,956.32	$631,154.68	$1,440,111.00	$61,757.00	$73,360.99	$127,651.37	$176,108.83
33		EM&V	$50,000.00	$29,627.03	$20,372.97	$50,000.00	$6,000.00	$521.12	$6,500.00	$11,526.72
34		Other	$20,000.00	$695.41	$19,304.59	$20,000.00	$3.99	$351.17	$12.05	$199.40
35		Sum:	$1,545,042.00	$855,232.51	$689,809.49	$1,545,042.00	$69,256.09	$76,259.67	$136,449.39	$189,532.52
36	000020614 IN Statewide-Res Energy Audit	Staffing	$44,657.00	$18,102.51	$26,554.49	$44,657.00	$1,983.70	$2,244.61	$2,740.70	$1,794.23
37		Delivery	$673,670.00	$704,482.96	($30,812.96)	$673,670.00	$171,818.00	$110,577.86	$146,376.74	$248,543.30
38		EM&V	$38,067.00	$33,942.02	$4,124.98	$38,067.00	$8,000.00	$612.35	$7,499.99	$8,534.71
39		Other	$12,689.00	$452.50	$12,236.50	$12,689.00	$7.07	$233.56	$18.35	$83.20
40		Sum:	$769,083.00	$756,979.99	$12,103.01	$769,083.00	$181,808.77	$113,668.38	$156,635.78	$258,955.44
41	000020615 IN Statewide-Res Low Inc Weath	Staffing	$37,742.00	$17,033.30	$20,708.70	$37,742.00	$1,568.65	$1,606.00	$2,057.47	$1,556.47
42		Delivery	$1,792,799.00	$928,388.79	$864,410.21	$1,792,799.00	$166,149.00	$125,405.92	$68,986.31	$98,201.10
43		EM&V	$129,324.00	$29,069.30	$100,254.70	$129,324.00	$4,500.00	$521.13	$6,499.98	$9,539.35
44		Other	$21,554.00	$887.54	$20,666.46	$21,554.00	$8.08	$497.54	$9.54	$81.37
45		Sum:	$1,981,419.00	$975,378.93	$1,006,040.07	$1,981,419.00	$172,225.73	$128,030.59	$77,553.30	$109,378.29
46	000020616 IN Statewide-Energ Eff School:	Staffing	$56,393.00	$14,793.96	$41,599.04	$56,393.00	$409.03	$1,060.42	$1,113.10	$1,173.72
47		Delivery	$333,705.00	$515,000.99	($181,295.99)	$333,705.00	$30,624.00	$25,057.69	$108,345.05	$30,891.97
48		EM&V	$162,997.00	$36,846.48	$126,150.52	$162,997.00	$3,000.00	$3,411.26	$3,000.00	$3,284.65
49		Other	$33,466.00	$1,019.92	$32,446.08	$33,466.00	$0.00	$167.80	$6.30	$79.23
50		Sum:	$586,561.00	$567,661.35	$18,899.65	$586,561.00	$34,033.03	$29,697.17	$112,464.45	$35,429.57
51	000020617 IN Statewide-C&I Prescriptive	Staffing	$88,202.00	$70,228.98	$17,973.02	$88,202.00	$4,580.66	$10,565.10	$13,526.14	$7,856.50
52		Incentives	$4,938,109.00	$1,881,147.70	$3,056,961.30	$4,938,109.00	$123,324.30	$166,527.00	$317,336.84	$303,915.00
53		Incentive Accrual	$0.00	$0.00		$0.00	$0.00	$0.00	$0.00	$0.00
54		Delivery	$186,695.00	$566,157.23	($379,462.23)	$186,695.00	$0.00	$0.00	$0.00	$0.00
55		Delivery Accrual	$0.00	($0.00)		$0.00	$22,750.00	$25,007.41	$197,427.72	$5,553.74
56		EM&V	$97,547.00	$55,850.30	$41,696.70	$97,547.00	$0.00	$0.00	$13,231.91	$15,205.87
57		EM&V Accrual	$0.00	$0.00		$0.00	$8,000.00	$13,231.92	$268.08	$0.00
58		Other	$40,645.00	$2,634.36	$38,010.64	$40,645.00	$9.95	$270.87	$523.08	$1,107.65
59		Sum:	$5,351,198.00	$2,576,018.57	$2,775,179.43	$5,351,198.00	$158,664.91	$215,602.30	$542,313.77	$333,638.76
60	000020618 IN Core+ Res On-Line Audit	Staffing	$134,007.00	$38,552.97	$95,454.03	$134,007.00	$1,845.62	$1,992.80	$2,640.51	$2,341.81
61		Delivery	$119,675.00	$262,906.22	($143,231.22)	$119,675.00	$19,917.50	$49,089.84	$55,272.05	$21,657.95

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
62		EM&V	$66,036.00	$21,993.71		$44,042.29			$66,036.00		$800.00	$583.50	$9,199.64	$232.66
63		Other	$18,868.00	$93.95		$18,774.05			$18,868.00		$5.20	$0.00	$11.88	$6.61
64		Sum:	$338,586.00	$323,546.85		$15,039.15			$338,586.00		$22,568.32	$51,666.14	$67,124.08	$24,239.03
65	000020619 IN Core+ Res New Construction	Staffing	$34,931.00	$27,771.29		$7,159.71			$34,931.00		$1,584.38	$1,031.64	$1,256.71	$2,462.60
66		Incentives	$84,000.00	$98,940.00		($14,940.00)			$84,000.00		$0.00	$0.00	$0.00	$0.00
67		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
68		Delivery	$154,820.00	$132,559.65		$22,260.35			$154,820.00		$0.00	$0.00	$0.00	$0.00
69		Delivery Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$8,062.00
70		EM&V	$50,000.00	$5,354.03		$44,645.97			$50,000.00		$0.00	$0.00	$0.00	$0.00
71		EM&V Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
72		Other	$10,000.00	$259.43		$9,740.57			$10,000.00		$8.08	$0.00	$6.13	$3.06
73		Sum:	$333,751.00	$264,884.40		$68,866.60			$333,751.00		$1,592.46	$1,031.64	$1,262.84	$10,527.66
74	000020621 IN Core+ Res Home Weatherization	Staffing	$30,238.00	$35,306.73		($5,068.73)			$30,238.00		$1,537.07	$1,782.36	$1,526.65	$1,650.59
75		Incentives	$482,386.00	$229,047.14		$253,338.86			$482,386.00		$0.00	$0.00	$0.00	$0.00
76		Incentive Accrual	$0.00	$0.00					$0.00		$2,700.00	$0.00	$0.00	$0.00
77		Delivery	$864,285.00	$364,773.37		$499,511.63			$864,285.00		$0.00	$0.00	$17,185.00	$34,370.00
78		Delivery Accrual	$0.00	$0.00					$0.00		$17,185.00	$17,185.00	$0.00	($24,549.00)
79		EM&V	$85,998.00	$20,844.40		$65,153.60			$85,998.00		$0.00	$350.10	$0.00	$3,763.01
80		EM&V Accrual	$0.00	$0.00					$0.00		$500.00	$0.00	$6,963.01	($3,608.94)
81		Other	$16,763.00	$320.10		$16,442.90			$16,763.00		$0.00	$0.00	$37.46	$12.11
82		Sum:	$1,479,670.00	$650,291.74		$829,378.26			$1,479,670.00		$21,922.07	$19,317.46	$25,712.12	$11,637.77
83	000020622 IN Core+ Res Home Energy Rptg	Staffing	$25,875.00	$26,306.30		($431.30)			$25,875.00		$1,748.13	$2,118.77	$3,029.57	$2,048.26
84		Delivery	$664,323.00	$664,323.00		$0.00			$664,323.00		$0.00	$491,403.00	$0.00	$0.00
85		EM&V	$40,000.00	$30,686.70		$9,313.30			$40,000.00		$500.00	$583.50	$16,206.03	$1,563.86
86		Other	$20,000.00	$68.37		$19,931.63			$20,000.00		$5.09	$0.00	$12.62	$7.48
87		Sum:	$750,198.00	$721,384.37		$28,813.63			$750,198.00		$2,253.22	$494,105.27	$19,248.22	$3,619.60
88	000020623 IN Core+ Res Peak Reduction	Staffing	$110,405.00	$27,195.50		$83,209.50			$110,405.00		$1,663.13	$1,473.40	$1,810.00	$852.38
89	(Bill Credits)	Incentives	$211,622.00	$335,752.00		($124,130.00)			$211,622.00		$0.00	$0.00	$0.00	$1,880.00
90		Delivery	$1,235,450.00	$746,036.76		$489,413.24			$1,235,450.00		$67,000.00	$58,405.05	$164,155.85	$123,695.46
91		EM&V	$105,172.00	$38,631.48		$66,540.52			$105,172.00		$1,000.00	$636.10	$20,732.87	$1,782.23
92		Other	$31,552.00	$74.22		$31,477.78			$31,552.00		$7.32	$0.00	$8.77	$4.46
93		Sum:	$1,694,201.00	$1,147,689.96		$546,511.04			$1,694,201.00		$69,670.45	$60,514.55	$186,707.49	$128,214.53
94	000020624 IN Core+ Renewables & Demonstr	Staffing	$46,646.00	$16,351.17		$30,294.83			$46,646.00		$1,663.67	$1,457.19	$1,413.57	$3,727.81
95		Incentives	$50,242.00	$25,625.14		$24,616.86			$50,242.00		$0.00	$0.00	$0.00	$13,596.00
96		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
97		Delivery	$46,336.00	$0.00		$46,336.00			$46,336.00		$0.00	$0.00	$0.00	$0.00
98		EM&V	$99,292.00	$7,677.58		$91,614.42			$99,292.00		$0.00	$0.00	$933.60	$1,233.41
99		EM&V Accrual	$0.00	($0.00)					$0.00		$500.00	$350.10	$2,883.31	($1,693.06)
100		Other	$3,097.00	$245.91		$32,851.09			$33,097.00		$5.70	$0.00	$36.98	$3.34
101		Sum:	$275,613.00	$49,899.80		$225,713.20			$275,613.00		$2,169.37	$1,807.29	$5,267.46	$16,867.50
102	000020625 IN Core+ C&I Retro-Comm Lite	Staffing	$95,332.00	$53,523.50		$41,808.50			$95,332.00		$5,181.54	$3,670.86	$4,249.90	$3,749.86
103		Incentives	$813,623.00	$1,263,269.69		($449,646.69)			$813,623.00		$0.00	$0.00	$0.00	$214,813.92
104		Delivery	$1,046,877.00	$640,000.00		$406,877.00			$1,046,877.00		$0.00	$0.00	$0.00	$119,800.00
105		EM&V	$163,748.00	$72,526.33		$91,221.67			$163,748.00		$11,000.00	$9,251.75	$22,372.40	$3,423.82
106		Other	$68,228.00	$1,372.22		$66,855.78			$68,228.00		$7.32	$0.00	$174.63	$70.99
107		Sum:	$2,187,808.00	$2,030,691.74		$157,116.26			$2,187,808.00		$16,188.86	$12,922.61	$26,796.93	$341,858.59
108	000020626 IN Core+ C&I HVAC Optimization	Staffing	$69,863.00	$17,432.13		$52,430.87			$69,863.00		$1,039.17	$897.79	$1,101.08	$1,088.34
109		Incentives	$215,806.00	$875.00		$214,931.00			$215,806.00		$0.00	$0.00	$0.00	$0.00
110		Delivery	$0.00	$454.48		($454.48)			$0.00		$0.00	$0.00	$0.00	$0.00
111		EM&V	$100,000.00	$2,490.59		$97,509.41			$100,000.00		$0.00	$0.00	$1,262.58	$1,907.09
112		Other	$50,000.00	$296.46		$49,703.54			$50,000.00		$8.23	$0.00	$5.36	$77.08
113		Sum:	$435,669.00	$21,548.66		$414,120.34			$435,669.00		$1,047.40	$897.79	$2,369.02	$3,072.51
114	000020627 IN Core+ C&I Audit & SBDI	Staffing	$34,931.00	$24,128.89		$10,802.11			$34,931.00		$2,290.32	$1,681.28	$2,817.68	$2,151.50
115		Incentives	$292,547.00	$449,516.65		($156,969.65)			$292,547.00		$3,876.00	$0.00	$3,534.00	$5,685.00
116		Delivery	$352,073.00	$230,022.26		$122,050.74			$352,073.00		$1,720.40	$5,100.00	$2,679.40	$6,478.00
117		EM&V	$45,000.00	$62,611.62		($17,611.62)			$45,000.00		$6,000.00	$5,811.32	$16,005.13	$1,044.97
118		Other	$50,000.00	$185.96		$49,814.04			$50,000.00		$4.53	$0.00	$10.01	$73.56
119		Sum:	$774,551.00	$766,465.38		$8,085.62			$774,551.00		$13,891.25	$12,592.60	$25,046.22	$15,433.03
120	000023305 IN Core+ Residential EE Products	Staffing	$25,875.00	$30,053.81		($4,178.81)			$25,875.00		$265.74	$696.03	$960.77	$2,183.68
121		Incentives	$577,976.00	$110,050.00		$467,926.00			$577,976.00		$0.00	$0.00	$0.00	$0.00
122		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
123		Delivery	$14,315.00	$111,099.01		($96,784.01)			$14,315.00		$0.00	$0.00	$0.00	$0.00
124		Delivery Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$7,304.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
125		EM&V	$11,250.00	$7,467.76		$3,782.24			$11,250.00		$0.00	$0.00	$0.00	$0.00
126		EM&V Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
127		Other	$1,500.00	$408.54		$1,091.46			$1,500.00		$0.00	$0.00	$4.16	$2.34
128		Sum:	$630,916.00	$259,079.12		$371,836.88			$630,916.00		$265.74	$696.03	$964.93	$9,490.02
129	000023306 IN-New Program Development	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
130		Delivery	$210,000.00	$0.00		$210,000.00			$210,000.00		$0.00	$0.00	$0.00	$0.00
131		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
132		Sum:	$210,000.00	$0.00		$210,000.00			$210,000.00		$0.00	$0.00	$0.00	$0.00
133	000023307 IN-General EE Mgmt & Collaboration	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
134		Delivery	$105,000.00	$0.00		$105,000.00			$105,000.00		$0.00	$0.00	$0.00	$0.00
135		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
136		Sum:	$105,000.00	$0.00		$105,000.00			$105,000.00		$0.00	$0.00	$0.00	$0.00
137	000023308 IN-Codes Work	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
138		Delivery	$100,000.00	$0.00		$100,000.00			$100,000.00		$0.00	$0.00	$0.00	$0.00
139		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
140		Sum:	$100,000.00	$0.00		$100,000.00			$100,000.00		$0.00	$0.00	$0.00	$0.00
141	000023309 IN-MPS & Action Plan	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
142		Delivery	$75,000.00	$0.00		$75,000.00			$75,000.00		$0.00	$0.00	$0.00	$0.00
143		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
144		Sum:	$75,000.00	$0.00		$75,000.00			$75,000.00		$0.00	$0.00	$0.00	$0.00
145	000023310 IN-Evaluation & Related	Staffing	$0.00	$39,170.70		($39,170.70)			$0.00		$0.00	$1,869.52	$2,441.20	$3,970.23
146		AEP Labor	$0.00	$8,644.06		($8,644.06)			$0.00		$0.00	$0.00	$0.00	$0.00
147		Delivery	$140,000.00	$0.00		$140,000.00			$140,000.00		$0.00	$0.00	$0.00	$0.00
148		Other	$0.00	$164.78		($164.78)			$0.00		$0.00	$0.00	$11.14	$5.99
149		Sum:	$140,000.00	$47,979.54		$92,020.46			$140,000.00		$0.00	$1,869.52	$2,452.34	$3,976.22
150	000023311 IN EECO Program	Staffing	$0.00	$4,692.68		($4,692.68)			$0.00		$0.00	$0.00	$0.00	$198.67
151		AEP Labor	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
152		Depreciation	$65,172.00	$81,584.93		($16,412.93)			$65,172.00		$5,852.40	$5,899.02	$6,136.19	$6,233.92
153		Carrying Costs	$239,362.00	$251,955.98		($12,593.98)			$239,362.00		$20,508.10	$20,528.70	$20,587.55	$20,568.75
154		Delivery	$140,953.00	$0.00		$140,953.00			$140,953.00		$0.00	$0.00	$0.00	$0.00
155		EM&V	$0.00	$38,969.46		($38,969.46)			$0.00		$0.00	$0.00	$0.00	$24,180.72
156		Other	$0.00	$9.67		($9.67)			$0.00		$0.00	$0.00	$0.00	$0.00
157		Sum:	$445,487.00	$377,212.72		$68,274.28			$445,487.00		$26,360.50	$26,427.72	$26,723.74	$51,182.06
158														
159		GRAND TOTAL:	$23,516,627.00	$15,228,869.65		$8,287,757.35			$23,516,627.00		$955,361.79	$1,392,725.96	$1,757,436.45	$1,685,114.31

161 NOTE: Includes 06/26/2014 approved budget transfer of $196,923 from IQW to Home Energy Reporting
162 NOTE: Includes the following budget transfers approved 10/28/2014:
163     $35,000 from General EE Mgmt to IT Systems
164     $25,000 from MPS & Action Plan to IT Systems
165     $25,000 from Staff Development to IT Systems
166     $126,820 from EEP to RNC
167     $138,189 from C&I HVAC to C&I Audit / SBDI
168     $791,046 from C&I Prescriptive to C&I Incentives
169     $520,426 from C&I Prescriptive to C&I RCxL
170 NOTE: Includes 12/17/2014 approved budget transfer of $241,650 from C&I Prescriptive to C&I RCxL

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
	May Actual $ (includes accruals)	**June Actual $** (includes accruals)	**July Actual $** (includes accruals)	**August Actual $** (includes accruals)	**September Actual $** (includes accruals)	**October Actual $** (includes accruals)	**November Actual $** (includes accruals)	**December Actual $** (includes accruals)	**2014 Actual $s Booked in 2015**	**2014 Year-to-Date Actual $** (includes accruals)	**January - June 2014**	**July - Dec 2014**	**Full Year Check**
7	$245.96	$651.54	$44.63	$32.94	$1,004.27	$3,337.69	$529.38	$34.11	$0.00	$12,386.04	$7,403.02	$4,983.02	$0.00
8	$0.00	$0.00	$0.00	$6,221.55	$1,206.00	$0.00	$5,000.00	$2,084.22	$1,712.48	$16,224.25	$0.00	$16,224.25	$0.00
9	$0.00	($0.08)	$2.81	$0.00	$36.00	$1,547.08	$255.44	$2.41	$0.00	$5,985.08	$4,141.34	$1,843.74	$0.00
10	$245.96	$651.46	$47.44	$6,254.49	$2,246.27	$4,884.77	$5,784.82	$2,120.74	$1,712.48	$34,595.37	$11,544.36	$23,051.01	$0.00
11	$1,815.01	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,817.88	$2,817.88	$0.00	$0.00
12	$53,125.00	$2,057.39	$0.00	$0.00	$0.00	$0.00	$0.00	$1,162.72	$13,800.00	$123,270.11	$108,307.39	$14,962.72	$0.00
13	$2.18	$0.16	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$76.23	$76.23	$0.00	$0.00
14	$54,942.19	$2,057.55	$0.00	$0.00	$0.00	$0.00	$0.00	$1,162.72	$13,800.00	$126,164.22	$111,201.50	$14,962.72	$0.00
15	$1,620.57	$980.56	$495.83	$634.22	$693.01	$797.08	$650.06	$1,772.49	$0.00	$14,984.14	$9,941.45	$5,042.69	$0.00
16	$2,060.83	$2,848.34	$384.03	$4,296.10	$551.67	$663.00	$20,609.56	$39,384.89	$0.00	$179,633.03	$113,743.78	$65,889.25	$0.00
17	$3.77	$0.16	$101.84	$1.25	$128.29	$110.86	$0.08	$3.16	$0.00	$1,051.08	$705.60	$345.48	$0.00
18	$3,685.17	$3,829.06	$981.70	$4,931.57	$1,372.97	$1,570.94	$21,259.70	$41,160.54	$0.00	$195,668.25	$124,390.83	$71,277.42	$0.00
19	$2,716.91	$1,759.52	$1,960.01	$1,913.93	$1,328.77	$2,106.09	$1,660.52	$2,374.36	$0.00	$22,074.64	$10,730.96	$11,343.68	$0.00
20	$9,160.00	$15,640.00	$16,480.00	$18,240.00	$18,760.00	$15,960.00	$17,000.00	$14,520.00	$10,400.00	$155,160.00	$43,800.00	$111,360.00	$0.00
21	$38,290.50	$52,934.50	$60,870.00	$55,860.00	$50,952.50	$61,065.50	$31,749.50	$30,655.50	($11,213.00)	$475,177.50	$195,237.50	$279,940.00	$0.00
22	$1,077.46	($488.73)	$966.60	$2,238.69	$1,481.08	$5,517.70	$3,990.63	($2,941.65)	($533.20)	$24,025.01	$13,304.96	$10,720.05	$0.00
23	$58.83	$0.28	$8.86	$243.41	$0.20	$144.30	$0.16	$8.05	$0.00	$483.97	$78.99	$404.98	$0.00
24	$51,303.70	$69,845.57	$80,285.67	$78,496.03	$72,522.55	$84,793.59	$54,400.81	$44,616.26	($1,346.20)	$676,921.12	$263,152.41	$413,768.71	$0.00
25	$5,563.75	$4,579.81	$2,550.42	$4,698.79	$1,417.22	$8,053.33	$4,290.16	$7,506.51	$0.00	$59,302.23	$30,785.80	$28,516.43	$0.00
26	$46,825.00	$23,580.23	$22,266.90	$35,157.78	$41,620.13	$58,854.53	$56,978.01	$360,500.07	($10,578.22)	$646,614.98	$81,815.78	$564,799.20	$0.00
27	($35,594.00)	$82,606.90	$52,961.04	$62,264.08	$63,485.99	$70,651.43	$70,686.20	$273,915.83	($18,365.04)	$960,321.75	$384,722.22	$575,599.53	$0.00
28	$3,539.13	$1,609.45	$3,184.30	$7,467.80	$8,490.47	$3,695.92	$12,996.01	$2,489.03	($980.40)	$136,283.76	$98,940.63	$37,343.13	$0.00
29	$11.98	$204.32	$151.37	$151.37	$293.84	$9.89	$0.60	$171.49	$1.81	$1,052.34	$402.13	$650.21	$0.00
30	$20,345.86	$112,580.71	$80,985.68	$109,739.82	$115,307.65	$141,265.10	$144,950.98	$644,582.93	($29,923.66)	$1,803,575.06	$596,666.56	$1,206,908.50	$0.00
31	$2,396.81	$1,316.24	$867.61	$929.02	$578.21	$948.72	$811.81	$600.30	$0.00	$15,953.75	$11,218.08	$4,735.67	$0.00
32	$202,121.54	$47,058.74	$4,761.28	$42,393.21	$34,332.02	$31,702.21	$2,318.20	$5,390.93	$0.00	$808,956.32	$688,058.47	$120,897.85	$0.00
33	$1,039.41	($675.63)	($3,607.85)	$3,501.24	$4,697.11	($1,279.05)	$577.10	$4,098.53	($3,271.73)	$29,627.03	$24,911.68	$4,715.35	$0.00
34	$111.37	$0.24	$6.62	$2.19	$0.12	$4.22	$0.08	$3.96	$0.00	$695.41	$678.22	$17.19	$0.00
35	$205,669.19	$47,699.59	$2,027.66	$46,825.66	$39,607.46	$31,376.10	$3,707.19	$10,093.72	($3,271.73)	$855,232.51	$724,866.45	$130,366.06	$0.00
36	$2,790.18	$1,520.23	$1,067.66	$1,263.91	$764.52	$798.34	$501.82	$600.30	$32.31	$18,102.51	$13,073.65	$5,028.86	$0.00
37	$11,088.72	$2,318.59	$2,397.46	$2,089.49	$2,318.20	$2,318.20	$2,318.20	$2,318.20	$0.00	$704,482.96	$690,723.21	$13,759.75	$0.00
38	($2,135.88)	($1,413.80)	($1,252.87)	$2,000.92	$5,538.84	$2,492.91	($122.90)	$3,925.53	$262.22	$33,942.02	$21,097.37	$12,844.65	$0.00
39	$89.74	$0.28	$7.66	$2.70	$0.12	$5.50	$0.08	$2.43	$1.81	$452.50	$432.20	$20.30	$0.00
40	$11,832.76	$2,425.30	$2,219.91	$5,357.02	$8,621.68	$5,614.95	$2,697.20	$6,846.46	$296.34	$756,979.99	$725,326.43	$31,653.56	$0.00
41	$2,137.89	$1,198.96	$867.82	$1,027.56	$936.27	$1,458.03	$1,110.44	$1,507.74	$0.00	$17,033.30	$10,125.44	$6,907.86	$0.00
42	$45,936.40	$48,978.71	$41,997.58	$151,440.72	$151,705.66	$21,558.20	$6,394.20	$1,634.80	$0.19	$928,388.79	$553,657.44	$374,731.35	$0.00
43	($1,066.46)	($1,561.11)	($1,277.86)	$2,999.68	$5,338.09	$1,492.91	$77.11	$4,235.91	($2,229.43)	$29,060.30	$18,432.89	$10,636.41	$0.00
44	$134.07	$0.20	$6.02	$2.19	$0.12	$6.75	$136.28	$5.38	$0.00	$887.54	$730.80	$156.74	$0.00
45	$47,141.90	$48,616.76	$41,593.56	$155,470.15	$157,980.14	$24,515.89	$7,718.03	$7,383.83	($2,229.24)	$975,378.93	$582,946.57	$392,432.36	$0.00
46	$1,584.03	$1,287.30	$1,023.22	$994.35	$1,395.20	$1,773.67	$1,704.91	$1,275.01	$0.00	$14,793.96	$6,627.60	$8,166.36	$0.00
47	$14,436.94	$35,712.60	$21,741.21	$47,621.20	$78,915.27	$83,284.34	$7,429.20	$30,511.92	$429.60	$515,000.99	$245,068.25	$269,932.74	$0.00
48	$5,709.64	$1,516.05	$936.24	$3,999.87	$4,728.05	$1,281.34	$5,722.34	$7,654.55	($7,397.51)	$36,846.48	$19,921.60	$16,924.88	$0.00
49	$142.01	$218.00	$6.49	$2.59	$0.12	$336.32	$52.80	$8.26	$0.00	$1,019.92	$613.34	$406.58	$0.00
50	$21,872.62	$38,733.95	$23,707.16	$52,618.01	$85,038.64	$86,675.67	$14,909.25	$39,449.74	($6,967.91)	$567,661.35	$272,230.79	$295,430.56	$0.00
51	$8,965.98	$5,902.85	$3,758.65	$3,666.88	$2,882.01	$5,424.71	$2,188.08	$911.42	$0.00	$70,228.98	$51,397.23	$18,831.75	$0.00
52	$100,555.06	$92,085.00	$106,222.00	$97,345.00	$237,151.90	$336,685.60	$0.00	$0.00	$0.00	$1,881,147.70	$1,103,743.20	$777,404.50	$0.00
53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
54	$22,757.41	$60,704.70	$39,119.38	$198,171.55	$37,987.14	$33,022.98	$69,379.45	$102,696.42	$2,318.20	$566,157.23	$83,462.11	$482,695.12	$0.00
55	$32,718.54	($56,686.50)	($40,600.77)	($165,160.02)	$31,392.31	$67,355.24	($67,061.25)	($100,378.22)	($2,318.20)	($0.00)	$276,770.91	($276,770.91)	($0.00)
56	$4,456.23	$2,171.29	$1,168.16	$997.23	$2,650.15	$1,579.25	$1,115.53	$4,388.72	$8,885.96	$55,850.30	$35,065.30	$20,785.00	$0.00
57	($3,500.00)	($3,000.00)	($12,000.00)	$6,000.00	$7,000.00	($4,000.00)	$3,000.00	$5,000.00	($20,000.00)	$0.00	$15,000.00	($15,000.00)	$0.00
58	$249.75	$111.16	$29.69	$9.46	$5.40	$162.95	$0.40	$154.00	$0.00	$2,634.36	$2,272.46	$361.90	$0.00
59	$166,202.97	$151,288.50	$97,697.11	$141,030.10	$319,068.91	$440,230.73	$8,622.21	$12,772.34	($11,114.04)	$2,576,018.57	$1,567,711.21	$1,008,307.36	$0.00
60	$4,237.19	$2,996.41	$2,471.90	$3,749.30	$3,045.89	$4,443.34	$3,396.05	$5,392.15	$0.00	$38,552.97	$16,054.34	$22,498.63	$0.00
61	$17,327.63	$5,557.08	$7,544.32	$2,799.18	$5,420.51	$46,997.52	$9,417.50	$4,671.85	$17,233.29	$262,906.22	$168,822.05	$94,084.17	$0.00

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
62	$1,668.44	$990.65	$641.18	$1,903.17	(illegible)	$1,408.45	$5,926.80	(illegible)	(illegible)	$21,993.71	$13,474.89	$8,518.82	$0.00
63	$5.35	$4.40	$15.08	$6.21	$0.40	$22.00	$0.36	$16.46	$0.00	$93.95	$33.44	$60.51	$0.00
64	$23,238.61	$9,548.54	$10,672.48	$8,457.86	$8,421.70	$52,871.31	$18,740.71	$9,080.46	$16,917.61	$323,546.85	$198,384.72	$125,162.13	$0.00
65	$3,132.12	$2,721.22	$1,448.11	$1,802.16	$1,645.66	$3,196.46	$3,668.07	$3,822.16	$0.00	$27,771.29	$12,188.67	$15,582.62	$0.00
66	$0.00	$5,760.00	$4,680.00	$360.00	$26,160.00	$18,960.00	$26,820.00	$14,400.00	$1,800.00	$98,940.00	$5,760.00	$93,180.00	$0.00
67	$0.00	$0.00	$360.00	$5,760.00	(illegible)	(illegible)	$0.00	$1,800.00	(illegible)	$0.00	$0.00	$0.00	$0.00
68	$0.00	$35,490.00	$0.00	$0.00	$27,918.30	$0.00	$35,669.02	$0.00	$33,482.33	$132,559.65	$35,490.00	$97,069.65	$0.00
69	$8,062.00	(illegible)	$9,921.00	$10,269.37	(illegible)	$15,442.89	(illegible)	$13,660.45	(illegible)	$0.00	$9,935.19	(illegible)	$0.00
70	$0.00	$689.64	$408.45	$730.98	$408.45	$991.95	$1,509.22	$148.54	$466.80	$5,354.03	$689.64	$4,664.39	$0.00
71	$1,000.00	(illegible)	(illegible)	$1,000.00	$0.00	$0.00	$2,000.00	(illegible)	(illegible)	$0.00	$500.00	(illegible)	$0.00
72	$5.60	$0.32	$13.68	$3.65	$0.20	$12.00	$64.64	$142.07	$0.00	$259.43	$23.19	$236.24	$0.00
73	$12,199.72	$37,972.37	$16,331.35	$19,926.16	$44,973.07	$33,743.30	$53,883.81	$31,973.22	($533.20)	$264,884.40	$64,586.69	$200,297.71	$0.00
74	$3,178.72	$3,217.88	$2,929.53	$3,291.07	$2,661.41	$3,992.58	$4,022.53	$5,516.34	$0.00	$35,306.73	$12,893.27	$22,413.46	$0.00
75	$4,373.50	$31,686.16	$0.00	$12,305.92	$25,574.47	$51,809.64	$28,419.38	$60,663.21	$14,214.86	$229,047.14	$36,059.66	$192,987.48	$0.00
76	$13,300.00	(illegible)	$12,305.09	$12,646.09	(illegible)	(illegible)	$0.00	$10,433.62	(illegible)	$0.00	$0.00	$0.00	$0.00
77	$0.00	$23,443.22	$0.00	$0.00	$62,479.79	$0.00	$97,287.65	$0.00	$130,007.71	$364,773.37	$74,998.22	$289,775.15	$0.00
78	$26,247.70	$766.19	$18,875.01	$31,863.66	(illegible)	$62,763.31	(illegible)	$76,849.80	(illegible)	$0.00	$36,834.89	(illegible)	$0.00
79	$3,983.78	$0.00	$1,310.28	$2,158.95	$1,179.63	$875.25	$6,507.56	$201.59	$514.25	$20,844.40	$8,096.89	$12,747.51	$0.00
80	(illegible)	$570.29	(illegible)	$1,000.00	(illegible)	$4,000.00	$0.00	(illegible)	(illegible)	$0.00	$1,750.00	(illegible)	$0.00
81	$3.84	$8.81	$16.18	$7.40	$0.36	$143.56	$49.60	$40.78	$0.00	$320.10	$62.22	$257.88	$0.00
82	$48,413.18	$43,692.55	$34,686.91	$63,273.09	$17,741.44	$118,737.34	$88,575.91	$149,705.34	$6,876.56	$650,291.74	$170,695.15	$479,596.59	$0.00
83	$2,635.59	$2,107.71	$1,306.15	$1,874.47	$1,934.49	$2,739.62	$2,035.07	$2,728.47	$0.00	$26,306.30	$13,688.03	$12,618.27	$0.00
84	$0.00	$0.00	$0.00	$0.00	$172,920.00	$0.00	$0.00	$0.00	$0.00	$664,323.00	$491,403.00	$172,920.00	$0.00
85	$1,668.42	$430.69	$1,421.03	$366.03	$1,517.19	$6,209.88	$1,525.15	(illegible)	(illegible)	$30,686.70	$20,952.50	$9,734.20	$0.00
86	$4.79	$0.24	$10.61	$3.31	$0.20	$13.98	$0.20	$9.85	$0.20	$68.37	$30.22	$38.15	$0.00
87	$4,308.80	$2,538.64	$2,737.79	$2,243.81	$176,371.88	$8,963.48	$3,560.42	$1,738.32	($305.08)	$721,384.37	$526,073.75	$195,310.62	$0.00
88	$1,088.52	$2,616.62	$2,302.96	$3,535.99	$2,769.98	$3,709.09	$2,449.73	$2,923.70	$0.00	$27,195.50	$9,504.05	$17,691.45	$0.00
89	$62,464.00	$63,616.00	$72,688.00	$67,008.00	$67,816.00	$16.00	$264.00	$0.00	$0.00	$335,752.00	$127,960.00	$207,792.00	$0.00
90	$78,047.22	$54,101.97	$62,432.45	$44,002.96	$39,346.87	$18,111.57	$18,368.68	$18,368.68	$0.00	$746,036.76	$545,405.55	$200,631.21	$0.00
91	$2,109.76	$92.86	$1,117.94	$2,746.57	(illegible)	$7,021.10	$6,593.74	(illegible)	(illegible)	$38,631.48	$26,353.82	$12,277.66	$0.00
92	$2.01	$0.12	$13.15	$5.79	$0.40	$20.06	$0.28	$11.86	$0.00	$74.22	$22.68	$51.54	$0.00
93	$143,711.51	$120,427.57	$138,554.50	$117,299.31	$107,933.25	$28,677.82	$27,676.43	$18,452.78	($350.23)	$1,147,689.96	$709,246.10	$438,443.86	$0.00
94	$2,519.12	$702.25	$453.87	$632.92	$309.04	$547.04	$905.28	$1,891.27	$128.14	$16,351.17	$11,483.61	$4,867.56	$0.00
95	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$381.84	$11,647.30	$0.00	$25,625.14	$13,596.00	$12,029.14	$0.00
96	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
97	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
98	$2,967.32	$0.00	$806.34	$408.45	$0.00	$350.10	$978.36	$0.00	$0.00	$7,677.58	$5,134.33	$2,543.25	$0.00
99	(illegible)	(illegible)	(illegible)	$0.00	$0.00	$0.00	$1,500.00	(illegible)	$0.00	(illegible)	$1,200.00	(illegible)	$0.00
100	$122.51	$0.24	$3.16	$0.79	$0.08	$2.25	$60.52	$4.22	$6.12	$245.91	$168.77	$77.14	$0.00
101	$4,995.57	$475.52	$563.37	$1,042.16	$309.12	$899.39	$3,826.00	$11,542.79	$134.26	$49,899.80	$31,582.71	$18,317.09	$0.00
102	$4,458.34	$3,919.88	$2,300.22	$3,842.58	$2,056.83	$7,582.18	$4,292.47	$7,150.31	$1,068.53	$53,523.50	$25,230.38	$28,293.12	$0.00
103	$96,178.48	$0.00	$11,160.73	$36,016.86	$70,008.25	$40,592.25	$70,026.79	$709,947.40	$14,525.01	$1,263,269.69	$310,992.40	$952,277.29	$0.00
104	$59,192.83	$32,000.00	$34,705.63	$40,731.37	$48,971.70	$41,840.54	$48,976.19	$221,231.38	(illegible)	$640,000.00	$210,992.83	$429,007.17	$0.00
105	$10,269.62	(illegible)	$2,847.25	$3,815.56	$5,526.07	$1,490.42	$4,699.24	$3,202.81	(illegible)	$72,526.33	$51,543.31	$20,983.02	$0.00
106	$171.08	$70.28	$19.70	$71.03	$253.36	$226.86	$0.60	$270.66	$35.71	$1,372.22	$494.30	$877.92	$0.00
107	$170,270.35	$31,215.88	$51,033.53	$84,477.40	$126,816.21	$91,732.25	$127,995.29	$941,802.56	$7,581.28	$2,030,691.74	$599,253.22	$1,431,438.52	$0.00
108	$1,784.51	$2,587.11	$1,317.17	$2,241.97	$588.75	$2,221.67	$842.67	$1,346.71	$375.19	$17,432.13	$8,498.00	$8,934.13	$0.00
109	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$875.00	$0.00	$875.00	$0.00	$875.00	$0.00
110	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$454.48	$0.00	$454.48	$0.00	$454.48	$0.00
111	(illegible)	(illegible)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,490.59	$2,490.59	$0.00	$0.00
112	$96.98	$0.16	$13.01	$3.31	$74.68	$4.23	$0.16	$4.08	$9.18	$296.46	$187.81	$108.65	$0.00
113	$1,548.29	$2,241.39	$1,330.18	$2,245.28	$663.43	$2,225.90	$842.83	$2,680.27	$384.37	$21,548.66	$11,176.40	$10,372.26	$0.00
114	$2,802.99	$2,649.55	$1,790.86	$2,679.52	$849.00	$2,258.12	$1,161.67	$996.40	$0.00	$24,128.89	$14,393.32	$9,735.57	$0.00
115	$3,591.00	$0.00	$14,578.14	$28,263.00	$44,929.09	$122,975.00	$58,649.52	$163,435.90	$0.00	$449,516.65	$16,686.00	$432,830.65	$0.00
116	$10,697.84	$69,822.01	$12,474.89	$15,308.59	$17,313.62	$30,379.93	$19,955.41	$38,092.18	(illegible)	$230,022.26	$96,497.65	$133,524.61	$0.00
117	$3,450.20	$1,311.49	$2,200.22	$3,787.55	$5,966.75	$7,290.20	$11,540.23	(illegible)	(illegible)	$62,611.62	$33,623.11	$28,988.51	$0.00
118	$4.98	$0.28	$13.32	$4.50	$0.28	$5.99	$62.88	$5.63	$0.00	$185.96	$93.36	$92.60	$0.00
119	$20,547.01	$73,783.33	$31,057.41	$50,043.16	$69,058.74	$162,909.24	$91,369.71	$202,084.07	($1,350.39)	$766,465.38	$161,293.44	$605,171.94	$0.00
120	$3,228.81	$2,663.45	$2,169.29	$3,850.62	$1,972.40	$4,383.55	$3,002.54	$4,676.93	$0.00	$30,053.81	$9,998.48	$20,055.33	$0.00
121	$0.00	$1,500.00	$14,600.00	$4,590.00	$24,120.00	$18,530.00	$9,910.00	$24,740.00	$12,060.00	$110,050.00	$1,500.00	$108,550.00	$0.00
122	$0.00	$0.00	$0.00	$8,530.00	(illegible)	(illegible)	$0.00	$12,287.00	(illegible)	$0.00	$0.00	$0.00	$0.00
123	$0.00	$28,454.00	$0.00	$0.00	$26,905.84	$0.00	$26,596.94	$0.00	$29,142.23	$111,099.01	$28,454.00	$82,645.01	$0.00
124	$7,304.00	(illegible)	$10,985.34	$10,208.52	(illegible)	$12,750.05	(illegible)	$18,918.20	(illegible)	$0.00	$7,564.44	(illegible)	$0.00

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
125	$0.00	$143.23	$233.40	$116.70	$1,713.45	$2,450.70	$2,736.01	$74.27	$0.00	$7,467.76	$143.23	$7,324.53	$0.00
126	$0.00	$500.00	$0.00	$500.00	($500.00)	$3,500.00	($1,000.00)	($3,000.00)	$0.00	$0.00	$500.00	($500.00)	$0.00
127	$4.94	$0.32	$13.38	$5.48	$0.40	$99.46	$135.84	$142.22	$0.00	$408.54	$11.76	$396.78	$0.00
128	$10,537.75	$26,217.44	$28,001.41	$27,801.32	$35,250.68	$37,233.76	$25,174.97	$57,838.62	($393.55)	$259,079.12	$48,171.91	$210,907.21	$0.00
129	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
130	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
131	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
132	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
133	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
134	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
135	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
136	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
137	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
138	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
139	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
140	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
141	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
142	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
143	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
144	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
145	$7,568.46	$4,291.33	$2,326.08	$3,611.15	$2,664.53	$3,614.64	$2,654.25	$4,159.31	$0.00	$39,170.70	$20,140.74	$19,029.96	$0.00
146	$6,464.42	$2,179.64	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$8,644.06	$8,644.06	$0.00	$0.00
147	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
148	$9.12	$0.72	$21.57	$5.86	$0.40	$19.20	$0.28	$90.50	$0.00	$164.78	$26.97	$137.81	$0.00
149	$14,042.00	$6,471.69	$2,347.65	$3,617.01	$2,664.93	$3,633.84	$2,654.53	$4,249.81	$0.00	$47,979.54	$28,811.77	$19,167.77	$0.00
150	$422.15	$0.00	$0.00	$228.53	$560.92	$922.40	$1,105.71	$1,254.30	$0.00	$4,692.68	$620.82	$4,071.86	$0.00
151	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
152	$6,298.73	$6,494.73	$6,710.62	$6,969.05	$8,154.69	$8,132.89	$8,079.46	$6,429.69	$193.54	$81,584.93	$36,914.99	$44,669.94	$0.00
153	$20,583.41	$20,108.78	$19,992.27	$19,206.73	$22,313.34	$22,158.37	$22,283.30	$22,203.17	$913.51	$251,955.98	$122,885.29	$129,070.69	$0.00
154	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
155	$1,664.44	($1,432.22)	$709.36	$14.40	$0.00	$0.00	$5,500.00	$8,197.44	$135.32	$38,969.46	$24,412.94	$14,556.52	$0.00
156	$0.00	$0.04	$0.00	$0.00	$0.04	$4.15	$0.08	$5.36	$0.00	$9.67	$0.04	$9.63	$0.00
157	$28,968.73	$25,171.33	$27,412.25	$26,418.71	$31,028.99	$31,217.81	$36,968.55	$38,089.96	$1,242.37	$377,212.72	$184,834.08	$192,378.64	$0.00
158													
159	$1,066,023.84	$857,484.70	$674,274.72	$1,007,568.12	$1,422,999.71	$1,393,973.18	$745,319.35	$2,279,427.48	($38,839.96)	$15,228,869.65	$7,714,147.05	$7,514,722.60	$0.00

Internal Staff Costs	
Res	$294,188.61
C&I	$224,615.73
Indirect	$69,358.76
Total	$588,163.10

Exhibit NM-17

I&M Discovery Request Response to CAC Set 1, Q2, 2014 Final Performance—JCW-17

I&M Utility Operations
2014 Actuals by Month Indiana DSM_EE Program Year 5
Authorized / Control Budget Variance Report

Project	Expense Category	2014 Year-to-Date December / Year-End		ANNUAL Budget $s Remaining (includes accruals)	2014 Authorized	January Actual $ (includes accruals)	February Actual $ (includes accruals)	March Actual $ (includes accruals)	April Actual $ (includes accruals)
		Forecast $	Actual $ (includes accruals)						
000018501 IN-DSM Staff Devlpmnt & Mbrshp	Staffing	$0.00	$12,386.04	($12,386.04)	$0.00	$3,497.11	$2,838.22	$87.97	$82.22
	Delivery	$95,000.00	$16,224.25	$78,775.75	$95,000.00	$0.00	$0.00	$0.00	$0.00
	Other	$0.00	$5,985.08	($5,985.08)	$0.00	$408.42	$2,706.71	$963.05	$63.24
	Sum:	$95,000.00	$34,595.37	$60,404.63	$95,000.00	$3,905.53	$5,544.93	$1,051.02	$145.46
000018502 IN-Information & Technlgy Syst	Staffing	$0.00	$2,817.88	($2,817.88)	$0.00	$0.00	$0.00	$0.00	$1,002.87
	Delivery	$235,000.00	$123,270.11	$111,729.89	$235,000.00	$0.00	$0.00	$53,125.00	$0.00
	Other	$0.00	$76.23	($76.23)	$0.00	$0.00	$0.00	$0.00	$73.89
	Sum:	$235,000.00	$126,164.22	$108,835.78	$235,000.00	$0.00	$0.00	$53,125.00	$1,076.76
000018503 IN-DSM Marketing & Cust Aware	Staffing	$0.00	$14,984.14	($14,984.14)	$0.00	$627.22	$1,748.41	$3,347.48	$1,617.21
	Delivery	$300,000.00	$179,633.03	$120,366.97	$300,000.00	$1,316.24	$661.18	$90,093.47	$16,763.72
	Other	$0.00	$1,051.08	($1,051.08)	$0.00	$0.00	$0.00	$189.10	$512.57
	Sum:	$300,000.00	$195,668.25	$104,331.75	$300,000.00	$1,943.46	$2,409.59	$93,630.05	$18,893.50
000018505 IN - Res Appliance Recycling	Staffing	$43,960.00	$22,074.64	$21,885.36	$43,960.00	$843.20	$1,887.51	$1,914.33	$1,609.49
	Incentives	$112,989.00	$155,160.00	($42,171.00)	$112,989.00	$0.00	$7,560.00	$5,240.00	$6,200.00
	Delivery	$395,463.00	$475,177.50	($79,714.50)	$395,463.00	$34,450.00	$10,965.50	$19,297.50	$39,299.50
	EM&V	$112,467.00	$24,025.01	$88,441.99	$112,467.00	$800.00	$1,766.57	$8,274.11	$1,875.55
	Other	$24,993.00	$483.97	$24,509.03	$24,993.00	$3.92	$0.00	$11.25	$4.71
	Sum:	$689,872.00	$676,921.12	$12,950.88	$689,872.00	$36,097.12	$22,179.58	$34,737.19	$48,989.25
000019206 IN - C&I Incentive Program	Staffing	$50,835.00	$59,302.23	($8,467.23)	$50,835.00	$6,242.74	$3,797.53	$5,441.04	$5,160.93
	Incentives	$950,691.00	$646,614.98	$304,076.02	$950,691.00	$0.00	$0.00	$0.00	$11,410.55
	Delivery	$880,062.00	$960,321.75	($80,259.75)	$880,062.00	$99,245.00	$98,290.45	$100,250.00	$39,923.87
	EM&V	$84,331.00	$136,283.76	($51,952.76)	$84,331.00	$14,000.00	$13,397.15	$53,952.05	$12,442.85
	Other	$21,083.00	$1,052.34	$20,030.66	$21,083.00	$9.77	$0.00	$158.02	$18.04
	Sum:	$1,987,002.00	$1,803,575.06	$183,426.94	$1,987,002.00	$119,497.51	$115,485.13	$159,801.11	$68,956.24
000020613 IN Statewide-Res Lighting	Staffing	$34,931.00	$15,953.75	$18,977.25	$34,931.00	$1,495.10	$2,026.39	$2,285.97	$1,697.57
	Delivery	$1,440,111.00	$808,956.32	$631,154.68	$1,440,111.00	$61,757.00	$73,360.99	$127,651.37	$176,108.83
	EM&V	$50,000.00	$29,627.03	$20,372.97	$50,000.00	$6,000.00	$521.12	$6,500.00	$11,526.72
	Other	$20,000.00	$695.41	$19,304.59	$20,000.00	$3.99	$351.17	$12.05	$199.40
	Sum:	$1,545,042.00	$855,232.51	$689,809.49	$1,545,042.00	$69,256.09	$76,259.67	$136,449.39	$189,532.52
000020614 IN Statewide-Res Energy Audit	Staffing	$44,657.00	$18,102.51	$26,554.49	$44,657.00	$1,983.70	$2,244.61	$2,740.70	$1,794.23
	Delivery	$673,670.00	$704,482.96	($30,812.96)	$673,670.00	$171,818.00	$110,577.86	$146,376.74	$248,543.30
	EM&V	$38,067.00	$33,942.02	$4,124.98	$38,067.00	$8,000.00	$612.35	$7,499.99	$8,534.71
	Other	$12,689.00	$452.50	$12,236.50	$12,689.00	$7.07	$233.56	$18.35	$83.20
	Sum:	$769,083.00	$756,979.99	$12,103.01	$769,083.00	$181,808.77	$113,668.38	$156,635.78	$258,955.44
000020615 IN Statewide-Res Low Inc Weath	Staffing	$37,742.00	$17,033.30	$20,708.70	$37,742.00	$1,568.65	$1,606.00	$2,057.47	$1,556.47
	Delivery	$1,792,799.00	$928,388.79	$864,410.21	$1,792,799.00	$166,149.00	$125,405.92	$68,986.31	$98,201.10
	EM&V	$129,324.00	$29,069.30	$100,254.70	$129,324.00	$4,500.00	$521.13	$6,499.98	$9,539.35
	Other	$21,554.00	$887.54	$20,666.46	$21,554.00	$8.08	$497.54	$9.54	$81.37
	Sum:	$1,981,419.00	$975,378.93	$1,006,040.07	$1,981,419.00	$172,225.73	$128,030.59	$77,553.30	$109,378.29
000020616 IN Statewide-Energ Eff Schools	Staffing	$56,393.00	$14,793.96	$41,599.04	$56,393.00	$409.03	$1,060.42	$1,113.10	$1,173.72
	Delivery	$333,705.00	$515,000.99	($181,295.99)	$333,705.00	$30,624.00	$25,057.69	$108,345.05	$30,891.97
	EM&V	$162,997.00	$36,846.48	$126,150.52	$162,997.00	$3,000.00	$3,411.26	$3,000.00	$3,284.65
	Other	$33,466.00	$1,019.92	$32,446.08	$33,466.00	$0.00	$167.80	$6.30	$79.23
	Sum:	$586,561.00	$567,661.35	$18,899.65	$586,561.00	$34,033.03	$29,697.17	$112,464.45	$35,429.57
000020617 IN Statewide-C&I Prescriptive	Staffing	$88,202.00	$70,228.98	$17,973.02	$88,202.00	$4,580.66	$10,565.10	$13,526.14	$7,856.50
	Incentives	$4,938,109.00	$1,881,147.70	$3,056,961.30	$4,938,109.00	$123,324.30	$166,527.00	$317,336.84	$303,915.00
	Incentive Accrual	$0.00	$0.00		$0.00	$0.00	$0.00	$0.00	$0.00
	Delivery	$186,695.00	$566,157.23	($379,462.23)	$186,695.00	$0.00	$0.00	$0.00	$0.00
	Delivery Accrual	$0.00	($0.00)		$0.00	$22,750.00	$25,007.41	$197,427.72	$5,553.74
	EM&V	$97,547.00	$55,850.30	$41,696.70	$97,547.00	$0.00	$0.00	$13,231.91	$15,205.87
	EM&V Accrual	$0.00	$0.00		$0.00	$8,000.00	$13,231.92	$268.08	$0.00
	Other	$40,645.00	$2,634.36	$38,010.64	$40,645.00	$9.95	$270.87	$523.08	$1,107.65
	Sum:	$5,351,198.00	$2,576,018.57	$2,775,179.43	$5,351,198.00	$158,664.91	$215,602.30	$542,313.77	$333,638.76
000020618 IN Core+ Res On-Line Audit	Staffing	$134,007.00	$38,552.97	$95,454.03	$134,007.00	$1,845.62	$1,992.80	$2,640.51	$2,341.81
	Delivery	$119,675.00	$262,906.22	($143,231.22)	$119,675.00	$19,917.50	$49,089.84	$55,272.05	$21,657.95

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
62		EM&V	$66,036.00	$21,993.71		$44,042.29			$66,036.00		$800.00	$583.50	$9,199.64	$232.66
63		Other	$18,868.00	$93.95		$18,774.05			$18,868.00		$5.20	$0.00	$11.88	$6.61
64		Sum:	$338,586.00	$323,546.85		$15,039.15			$338,586.00		$22,568.32	$51,666.14	$67,124.08	$24,239.03
65	000020619 IN Core+ Res New Construction	Staffing	$34,931.00	$27,771.29		$7,159.71			$34,931.00		$1,584.38	$1,031.64	$1,256.71	$2,462.60
66		Incentives	$84,000.00	$98,940.00		($14,940.00)			$84,000.00		$0.00	$0.00	$0.00	$0.00
67		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
68		Delivery	$154,820.00	$132,559.65		$22,260.35			$154,820.00		$0.00	$0.00	$0.00	$0.00
69		Delivery Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$8,062.00
70		EM&V	$50,000.00	$5,354.03		$44,645.97			$50,000.00		$0.00	$0.00	$0.00	$0.00
71		EM&V Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
72		Other	$10,000.00	$259.43		$9,740.57			$10,000.00		$8.08	$0.00	$6.13	$3.06
73		Sum:	$333,751.00	$264,884.40		$68,866.60			$333,751.00		$1,592.46	$1,031.64	$1,262.84	$10,527.66
74	000020621 IN Core+ Res Home Weatherization	Staffing	$30,238.00	$35,306.73		($5,068.73)			$30,238.00		$1,537.07	$1,782.36	$1,526.65	$1,650.59
75		Incentives	$482,386.00	$229,047.14		$253,338.86			$482,386.00		$0.00	$0.00	$0.00	$0.00
76		Incentive Accrual	$0.00	$0.00					$0.00		$2,700.00	$0.00	$0.00	$0.00
77		Delivery	$864,285.00	$364,773.37		$499,511.63			$864,285.00		$0.00	$0.00	$17,185.00	$34,370.00
78		Delivery Accrual	$0.00	$0.00					$0.00		$17,185.00	$17,185.00	$0.00	($24,549.00)
79		EM&V	$85,998.00	$20,844.40		$65,153.60			$85,998.00		$0.00	$350.10	$0.00	$3,763.01
80		EM&V Accrual	$0.00	$0.00					$0.00		$500.00	$0.00	$6,963.01	($3,608.94)
81		Other	$16,763.00	$320.10		$16,442.90			$16,763.00		$0.00	$0.00	$37.46	$12.11
82		Sum:	$1,479,670.00	$650,291.74		$829,378.26			$1,479,670.00		$21,922.07	$19,317.46	$25,712.12	$11,637.77
83	000020622 IN Core+ Res Home Energy Rptg	Staffing	$25,875.00	$26,306.30		($431.30)			$25,875.00		$1,748.13	$2,118.77	$3,029.57	$2,048.26
84		Delivery	$664,323.00	$664,323.00		$0.00			$664,323.00		$0.00	$491,403.00	$0.00	$0.00
85		EM&V	$40,000.00	$30,686.70		$9,313.30			$40,000.00		$500.00	$583.50	$16,206.03	$1,563.86
86		Other	$20,000.00	$68.37		$19,931.63			$20,000.00		$5.09	$0.00	$12.62	$7.48
87		Sum:	$750,198.00	$721,384.37		$28,813.63			$750,198.00		$2,253.22	$494,105.27	$19,248.22	$3,619.60
88	000020623 IN Core+ Res Peak Reduction	Staffing	$110,405.00	$27,195.50		$83,209.50			$110,405.00		$1,663.13	$1,473.40	$1,810.00	$852.38
89	(Bill Credits)	Incentives	$211,622.00	$335,752.00		($124,130.00)			$211,622.00		$0.00	$0.00	$0.00	$1,880.00
90		Delivery	$1,235,450.00	$746,036.76		$489,413.24			$1,235,450.00		$67,000.00	$58,405.05	$164,155.85	$123,695.46
91		EM&V	$105,172.00	$38,631.48		$66,540.52			$105,172.00		$1,000.00	$636.10	$20,732.87	$1,782.23
92		Other	$31,552.00	$74.22		$31,477.78			$31,552.00		$7.32	$0.00	$8.77	$4.46
93		Sum:	$1,694,201.00	$1,147,689.96		$546,511.04			$1,694,201.00		$69,670.45	$60,514.55	$186,707.49	$128,214.53
94	000020624 IN Core+ Renewables & Demonstr	Staffing	$46,646.00	$16,351.17		$30,294.83			$46,646.00		$1,663.67	$1,457.19	$1,413.57	$3,727.81
95		Incentives	$50,242.00	$25,625.14		$24,616.86			$50,242.00		$0.00	$0.00	$0.00	$13,596.00
96		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
97		Delivery	$46,336.00	$0.00		$46,336.00			$46,336.00		$0.00	$0.00	$0.00	$0.00
98		EM&V	$99,292.00	$7,677.58		$91,614.42			$99,292.00		$0.00	$0.00	$933.60	$1,233.41
99		EM&V Accrual	$0.00	($0.00)					$0.00		$500.00	$350.10	$2,883.31	($1,693.06)
100		Other	$33,097.00	$245.91		$32,851.09			$33,097.00		$5.70	$0.00	$36.98	$3.34
101		Sum:	$275,613.00	$49,899.80		$225,713.20			$275,613.00		$2,169.37	$1,807.29	$5,267.46	$16,867.50
102	000020625 IN Core+ C&I Retro-Comm Lite	Staffing	$95,332.00	$53,523.50		$41,808.50			$95,332.00		$5,181.54	$3,670.86	$4,249.90	$3,749.86
103		Incentives	$813,623.00	$1,263,269.69		($449,646.69)			$813,623.00		$0.00	$0.00	$0.00	$214,813.92
104		Delivery	$1,046,877.00	$640,000.00		$406,877.00			$1,046,877.00		$0.00	$0.00	$0.00	$119,800.00
105		EM&V	$163,748.00	$72,526.33		$91,221.67			$163,748.00		$11,000.00	$9,251.75	$22,372.40	$3,423.82
106		Other	$68,228.00	$1,372.22		$66,855.78			$68,228.00		$7.32	$0.00	$174.63	$70.99
107		Sum:	$2,187,808.00	$2,030,691.74		$157,116.26			$2,187,808.00		$16,188.86	$12,922.61	$26,796.93	$341,858.59
108	000020626 IN Core+ C&I HVAC Optimization	Staffing	$69,863.00	$17,432.13		$52,430.87			$69,863.00		$1,039.17	$897.79	$1,101.08	$1,088.34
109		Incentives	$215,806.00	$875.00		$214,931.00			$215,806.00		$0.00	$0.00	$0.00	$0.00
110		Delivery	$0.00	$454.48		($454.48)					$0.00	$0.00	$0.00	$0.00
111		EM&V	$100,000.00	$2,490.59		$97,509.41			$100,000.00		$0.00	$0.00	$1,262.58	$1,907.09
112		Other	$50,000.00	$296.46		$49,703.54			$50,000.00		$8.23	$0.00	$5.36	$77.08
113		Sum:	$435,669.00	$21,548.66		$414,120.34			$435,669.00		$1,047.40	$897.79	$2,369.02	$3,072.51
114	000020627 IN Core+ C&I Audit & SBDI	Staffing	$34,931.00	$24,128.89		$10,802.11			$34,931.00		$2,290.32	$1,681.28	$2,817.68	$2,151.50
115		Incentives	$292,547.00	$449,516.65		($156,969.65)			$292,547.00		$3,876.00	$0.00	$3,534.00	$5,685.00
116		Delivery	$352,073.00	$230,022.26		$122,050.74			$352,073.00		$1,720.40	$5,100.00	$2,679.40	$6,478.00
117		EM&V	$45,000.00	$62,611.62		($17,611.62)			$45,000.00		$6,000.00	$5,811.32	$16,005.13	$1,044.97
118		Other	$50,000.00	$185.96		$49,814.04			$50,000.00		$4.53	$0.00	$10.01	$73.56
119		Sum:	$774,551.00	$766,465.38		$8,085.62			$774,551.00		$13,891.25	$12,592.60	$25,046.22	$15,433.03
120	000023305 IN Core+ Residential EE Products	Staffing	$25,875.00	$30,053.81		($4,178.81)			$25,875.00		$265.74	$696.03	$960.77	$2,183.68
121		Incentives	$577,976.00	$110,050.00		$467,926.00			$577,976.00		$0.00	$0.00	$0.00	$0.00
122		Incentive Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$0.00
123		Delivery	$14,315.00	$111,099.01		($96,784.01)			$14,315.00		$0.00	$0.00	$0.00	$0.00
124		Delivery Accrual	$0.00	$0.00					$0.00		$0.00	$0.00	$0.00	$7,304.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
125		EM&V	$11,250.00	$7,467.76		$3,782.24			$11,250.00		$0.00	$0.00	$0.00	$0.00
126		EM&V Accrual	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
127		Other	$1,500.00	$408.54		$1,091.46			$1,500.00		$0.00	$0.00	$4.16	$2.34
128		Sum:	$630,916.00	$259,079.12		$371,836.88			$630,916.00		$265.74	$696.03	$964.93	$9,490.02
129	000023306 IN-New Program Development	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
130		Delivery	$210,000.00	$0.00		$210,000.00			$210,000.00		$0.00	$0.00	$0.00	$0.00
131		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
132		Sum:	$210,000.00	$0.00		$210,000.00			$210,000.00		$0.00	$0.00	$0.00	$0.00
133	000023307 IN-General EE Mgmt & Collaboration	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
134		Delivery	$105,000.00	$0.00		$105,000.00			$105,000.00		$0.00	$0.00	$0.00	$0.00
135		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
136		Sum:	$105,000.00	$0.00		$105,000.00			$105,000.00		$0.00	$0.00	$0.00	$0.00
137	000023308 IN-Codes Work	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
138		Delivery	$100,000.00	$0.00		$100,000.00			$100,000.00		$0.00	$0.00	$0.00	$0.00
139		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
140		Sum:	$100,000.00	$0.00		$100,000.00			$100,000.00		$0.00	$0.00	$0.00	$0.00
141	000023309 IN-MPS & Action Plan	Staffing	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
142		Delivery	$75,000.00	$0.00		$75,000.00			$75,000.00		$0.00	$0.00	$0.00	$0.00
143		Other	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
144		Sum:	$75,000.00	$0.00		$75,000.00			$75,000.00		$0.00	$0.00	$0.00	$0.00
145	000023310 IN-Evaluation & Related	Staffing	$0.00	$39,170.70		($39,170.70)			$0.00		$0.00	$1,869.52	$2,441.20	$3,970.23
146		AEP Labor	$0.00	$8,644.06		($8,644.06)			$0.00		$0.00	$0.00	$0.00	$0.00
147		Delivery	$140,000.00	$0.00		$140,000.00			$140,000.00		$0.00	$0.00	$0.00	$0.00
148		Other	$0.00	$164.78		($164.78)			$0.00		$0.00	$0.00	$11.14	$5.99
149		Sum:	$140,000.00	$47,979.54		$92,020.46			$140,000.00		$0.00	$1,869.52	$2,452.34	$3,976.22
150	000023311 IN EECO Program	Staffing	$0.00	$4,692.68		($4,692.68)			$0.00		$0.00	$0.00	$0.00	$198.67
151		AEP Labor	$0.00	$0.00		$0.00			$0.00		$0.00	$0.00	$0.00	$0.00
152		Depreciation	$65,172.00	$81,584.93		($16,412.93)			$65,172.00		$5,852.40	$5,899.02	$6,136.19	$6,233.92
153		Carrying Costs	$239,362.00	$251,955.98		($12,593.98)			$239,362.00		$20,508.10	$20,528.70	$20,587.55	$20,568.75
154		Delivery	$140,953.00	$0.00		$140,953.00			$140,953.00		$0.00	$0.00	$0.00	$0.00
155		EM&V	$0.00	$38,969.46		($38,969.46)			$0.00		$0.00	$0.00	$0.00	$24,180.72
156		Other	$0.00	$9.67		($9.67)			$0.00		$0.00	$0.00	$0.00	$0.00
157		Sum:	$445,487.00	$377,212.72		$68,274.28			$445,487.00		$26,360.50	$26,427.72	$26,723.74	$51,182.06
158														
159		GRAND TOTAL:	$23,516,627.00	$15,228,869.65		$8,287,757.35			$23,516,627.00		$955,361.79	$1,392,725.96	$1,757,436.45	$1,685,114.31
160														
161	NOTE: Includes 06/26/2014 approved budget transfer of $196,923 from IQW to Home Energy Reporting													
162	NOTE: Includes the following budget transfers approved 10/28/2014:													
163		$35,000 from General EE Mgmt to IT Systems												
164		$25,000 from MPS & Action Plan to IT Systems												
165		$25,000 from Staff Development to IT Systems												
166		$126,820 from EEP to RNC												
167		$138,189 from C&I HVAC to C&I Audit / SBDI												
168		$791,046 from C&I Prescriptive to C&I Incentives												
169		$520,426 from C&I Prescriptive to C&I RCxL												
170	NOTE: Includes 12/17/2014 approved budget transfer of $241,650 from C&I Prescriptive to C&I RCxL													
171														
172														
173														
174														
175														

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
	May Actual $ (includes accruals)	**June Actual $** (includes accruals)	**July Actual $** (includes accruals)	**August Actual $** (includes accruals)	**September Actual $** (includes accruals)	**October Actual $** (includes accruals)	**November Actual $** (includes accruals)	**December Actual $** (includes accruals)	**2014 Actual $s Booked in 2015**	**2014 Year-to-Date Actual $** (includes accruals)	**January - June 2014**	**July - Dec 2014**	**Full Year Check**
7	$245.96	$651.54	$44.63	$32.94	$1,004.27	$3,337.69	$529.38	$34.11	$0.00	$12,386.04	$7,403.02	$4,983.02	$0.00
8	$0.00	$0.00	$0.00	$6,221.55	$1,206.00	$0.00	$5,000.00	$2,084.22	$1,712.48	$16,224.25	$0.00	$16,224.25	$0.00
9	$0.00	$0.00	$2.81	$0.00	$36.00	$1,547.08	$255.44	$2.41	$0.00	$5,985.08	$4,141.34	$1,843.74	$0.00
10	$245.96	$651.46	$47.44	$6,254.49	$2,246.27	$4,884.77	$5,784.82	$2,120.74	$1,712.48	$34,595.37	$11,544.36	$23,051.01	$0.00
11	$1,815.01	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,817.88	$2,817.88	$0.00	$0.00
12	$53,125.00	$2,057.39	$0.00	$0.00	$0.00	$0.00	$0.00	$1,162.72	$13,800.00	$123,270.11	$108,307.39	$14,962.72	$0.00
13	$2.18	$0.16	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$76.23	$76.23	$0.00	$0.00
14	$54,942.19	$2,057.55	$0.00	$0.00	$0.00	$0.00	$0.00	$1,162.72	$13,800.00	$126,164.22	$111,201.50	$14,962.72	$0.00
15	$1,620.57	$980.56	$495.83	$634.22	$693.01	$797.08	$650.06	$1,772.49	$0.00	$14,984.14	$9,941.45	$5,042.69	$0.00
16	$2,060.83	$2,848.34	$384.03	$4,296.10	$551.67	$663.00	$20,609.56	$39,384.89	$0.00	$179,633.03	$113,743.78	$65,889.25	$0.00
17	$3.77	$0.16	$101.84	$1.25	$128.29	$110.86	$0.08	$3.16	$0.00	$1,051.08	$705.60	$345.48	$0.00
18	$3,685.17	$3,829.06	$981.70	$4,931.57	$1,372.97	$1,570.94	$21,259.70	$41,160.54	$0.00	$195,668.25	$124,390.83	$71,277.42	$0.00
19	$2,716.91	$1,759.52	$1,960.01	$1,913.93	$1,328.77	$2,106.09	$1,660.52	$2,374.36	$0.00	$22,074.64	$10,730.96	$11,343.68	$0.00
20	$9,160.00	$15,640.00	$16,480.00	$18,240.00	$18,760.00	$15,960.00	$17,000.00	$14,520.00	$10,400.00	$155,160.00	$43,800.00	$111,360.00	$0.00
21	$38,290.50	$52,934.50	$60,870.00	$55,860.00	$50,952.50	$61,065.50	$31,749.50	$30,655.50	($33,213.00)	$475,177.50	$195,237.50	$279,940.00	$0.00
22	$1,077.46	($988.77)	$966.80	$2,238.69	$1,481.08	$5,517.70	$3,990.63	($2,943.63)	($632.20)	$24,025.01	$13,304.96	$10,720.05	$0.00
23	$58.83	$0.28	$8.86	$243.41	$0.20	$144.30	$0.16	$8.05	$0.00	$483.97	$78.99	$404.98	$0.00
24	$51,303.70	$69,845.57	$80,285.67	$78,496.03	$72,522.55	$84,793.59	$54,400.81	$44,616.26	($1,346.20)	$676,921.12	$263,152.41	$413,768.71	$0.00
25	$5,563.75	$4,579.81	$2,550.42	$4,698.79	$1,417.22	$8,053.33	$4,290.16	$7,506.51	$0.00	$59,302.23	$30,785.80	$28,516.43	$0.00
26	$46,825.00	$23,580.23	$22,266.90	$35,157.78	$41,620.13	$58,854.53	$56,978.01	$360,500.07	($30,529.29)	$646,614.98	$81,815.78	$564,799.20	$0.00
27	($45,594.00)	$82,606.90	$52,961.04	$62,264.08	$63,485.99	$70,651.43	$70,686.20	$273,915.83	($33,365.90)	$960,321.75	$384,722.22	$575,599.53	$0.00
28	$3,539.13	$1,609.45	$3,184.30	$7,467.80	$8,490.47	$3,695.92	$12,996.01	$2,489.03	($909.80)	$136,283.76	$98,940.63	$37,343.13	$0.00
29	$11.98	$204.32	$23.02	$151.37	$293.84	$9.89	$0.60	$171.49	$0.00	$1,052.34	$402.13	$650.21	$0.00
30	$20,345.86	$112,580.71	$80,985.68	$109,739.82	$115,307.65	$141,265.10	$144,950.98	$644,582.93	($29,923.66)	$1,803,575.06	$596,666.56	$1,206,908.50	$0.00
31	$2,396.81	$1,316.24	$867.61	$929.02	$578.21	$948.72	$811.81	$600.30	$0.00	$15,953.75	$11,218.08	$4,735.67	$0.00
32	$202,121.54	$47,058.74	$4,761.28	$42,393.21	$34,332.02	$31,702.21	$2,318.20	$5,390.93	$0.00	$808,956.32	$688,058.47	$120,897.85	$0.00
33	$1,039.47	($675.85)	($3,607.85)	$3,501.24	$4,697.11	($1,279.59)	$577.10	$4,098.53	($5,271.74)	$29,627.03	$24,911.68	$4,715.35	$0.00
34	$111.37	$0.24	$6.62	$2.19	$0.12	$4.22	$0.08	$3.96	$0.00	$695.41	$678.22	$17.19	$0.00
35	$205,669.19	$47,699.59	$2,027.66	$46,825.66	$39,607.46	$31,376.10	$3,707.19	$10,093.72	($3,271.73)	$855,232.51	$724,866.45	$130,366.06	$0.00
36	$2,790.18	$1,520.23	$1,067.66	$1,263.91	$764.52	$798.34	$501.82	$600.30	$32.31	$18,102.51	$13,073.65	$5,028.86	$0.00
37	$11,088.72	$2,318.59	$2,397.46	$2,089.49	$2,318.20	$2,318.20	$2,318.20	$2,318.20	$0.00	$704,482.96	$690,723.21	$13,759.75	$0.00
38	($2,116.80)	($1,412.80)	($1,252.87)	$2,000.92	$5,538.84	$2,492.91	($322.90)	$3,925.53	$262.22	$33,942.02	$21,097.37	$12,844.65	$0.00
39	$89.74	$0.28	$7.66	$2.70	$0.12	$5.50	$0.08	$2.43	$1.81	$452.50	$432.20	$20.30	$0.00
40	$11,832.76	$2,425.30	$2,219.91	$5,357.02	$8,621.68	$5,614.95	$2,697.20	$6,846.46	$296.34	$756,979.99	$725,326.43	$31,653.56	$0.00
41	$2,137.89	$1,198.96	$867.82	$1,027.56	$936.27	$1,458.03	$1,110.44	$1,507.74	$0.00	$17,033.30	$10,125.44	$6,907.86	$0.00
42	$45,936.40	$48,978.71	$41,997.58	$151,440.72	$151,705.66	$21,558.20	$6,394.20	$1,634.80	$0.19	$928,388.79	$553,657.44	$374,731.35	$0.00
43	($1,066.46)	($1,561.41)	($3,777.86)	$2,999.68	$5,338.09	$1,492.91	$77.11	$4,235.91	($2,229.43)	$29,069.30	$18,432.89	$10,636.41	$0.00
44	$134.07	$0.20	$6.02	$2.19	$0.12	$6.75	$136.28	$5.38	$0.00	$887.54	$730.80	$156.74	$0.00
45	$47,141.90	$48,616.76	$41,593.56	$155,470.15	$157,980.14	$24,515.89	$7,718.03	$7,383.83	($2,229.24)	$975,378.93	$582,946.57	$392,432.36	$0.00
46	$1,584.03	$1,287.30	$1,023.42	$994.35	$1,395.20	$1,773.67	$1,704.91	$1,275.01	$0.00	$14,793.96	$6,627.60	$8,166.36	$0.00
47	$14,436.94	$35,712.60	$21,741.21	$47,621.20	$78,915.27	$83,284.34	$7,429.20	$30,511.92	$429.60	$515,000.99	$245,068.25	$269,932.74	$0.00
48	$5,709.64	$1,516.05	$936.24	$3,999.87	$4,728.05	$1,281.34	$5,722.34	$7,654.55	($7,292.59)	$36,846.48	$19,921.60	$16,924.88	$0.00
49	$142.01	$218.00	$6.49	$2.59	$0.12	$336.32	$52.80	$8.26	$0.00	$1,019.92	$613.34	$406.58	$0.00
50	$21,872.62	$38,733.95	$23,707.16	$52,618.01	$85,038.64	$86,675.67	$14,909.25	$39,449.74	($6,967.91)	$567,661.35	$272,230.79	$295,430.56	$0.00
51	$8,965.98	$5,902.85	$3,758.65	$3,666.88	$2,882.01	$5,424.71	$2,188.08	$911.42	$0.00	$70,228.98	$51,397.23	$18,831.75	$0.00
52	$100,555.06	$92,085.00	$106,222.00	$97,345.00	$237,151.90	$336,685.60	$0.00	$0.00	$0.00	$1,881,147.70	$1,103,743.20	$777,404.50	$0.00
53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
54	$22,757.41	$60,704.70	$39,119.38	$198,171.55	$37,987.14	$33,022.98	$69,379.45	$102,696.42	$2,318.20	$566,157.23	$83,462.11	$482,695.12	$0.00
55	$32,718.54	($6,686.50)	($80,600.72)	($165,160.02)	$31,392.31	$67,355.24	($67,661.25)	($106,278.24)	($2,418.30)	($6.00)	$276,770.91	($226,770.91)	($0.00)
56	$4,456.23	$2,171.29	$1,168.16	$997.23	$2,650.15	$1,579.25	$1,115.53	$4,388.72	$8,885.96	$55,850.30	$35,065.30	$20,785.00	$0.00
57	($4,500.00)	($3,000.00)	($12,000.00)	$6,000.00	$7,000.00	($4,000.00)	$3,000.00	$5,000.00	($50,000.00)	$0.00	$15,000.00	($15,000.00)	$0.00
58	$249.75	$111.16	$29.69	$9.46	$5.40	$162.95	$0.40	$154.00	$0.00	$2,634.36	$2,272.46	$361.90	$0.00
59	$166,202.97	$151,288.50	$97,697.11	$141,030.10	$319,068.91	$440,230.73	$8,622.21	$12,772.34	($11,114.04)	$2,576,018.57	$1,567,711.21	$1,008,307.36	$0.00
60	$4,237.19	$2,996.41	$2,471.90	$3,749.30	$3,045.89	$4,443.34	$3,396.05	$5,392.15	$0.00	$38,552.97	$16,054.34	$22,498.63	$0.00
61	$17,327.63	$5,557.08	$7,544.32	$2,799.18	$5,420.51	$46,997.52	$9,417.50	$4,671.85	$17,233.29	$262,906.22	$168,822.05	$94,084.17	$0.00

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
62	$1,668.44	$990.65	$641.18	$1,903.17	$(41.30)	$1,408.45	$5,926.80	$(1,000.00)	$(315.58)	$21,993.71	$13,474.89	$8,518.82	$0.00
63	$5.35	$4.40	$15.08	$6.21	$0.40	$22.00	$0.36	$16.46	$0.00	$93.95	$33.44	$60.51	$0.00
64	$23,238.61	$9,548.54	$10,672.48	$8,457.86	$8,421.70	$52,871.31	$18,740.71	$9,080.46	$16,917.61	$323,546.85	$198,384.72	$125,162.13	$0.00
65	$3,132.12	$2,721.22	$1,448.11	$1,802.16	$1,645.66	$3,196.46	$3,668.07	$3,822.16	$0.00	$27,771.29	$12,188.67	$15,582.62	$0.00
66	$0.00	$5,760.00	$4,680.00	$360.00	$26,160.00	$18,960.00	$26,820.00	$14,400.00	$1,800.00	$98,940.00	$5,760.00	$93,180.00	$0.00
67	$0.00	$0.00	$360.00	$5,760.00	$(3,260.00)	$(4,860.00)	$0.00	$1,800.00	$(1,800.00)	$0.00	$0.00	$0.00	$0.00
68	$0.00	$35,490.00	$0.00	$0.00	$27,918.30	$0.00	$35,669.02	$0.00	$33,482.33	$132,559.65	$35,490.00	$97,069.65	$0.00
69	$8,062.00	$(4,188.80)	$9,921.11	$10,269.37	$(5,299.54)	$15,442.89	$(15,847.54)	$13,660.45	$(534,282.5)	$0.00	$9,935.19	$(59,935.19)	$0.00
70	$0.00	$689.64	$408.45	$730.98	$408.45	$991.95	$1,509.22	$148.54	$466.80	$5,354.03	$689.64	$4,664.39	$0.00
71	$1,000.00	$(500.00)	$(500.00)	$1,000.00	$0.00	$0.00	$2,000.00	$(2,000.00)	$(1,000.00)	$0.00	$500.00	$(500.00)	$0.00
72	$5.60	$0.32	$13.68	$3.65	$0.20	$12.00	$64.64	$142.07	$0.00	$259.43	$23.19	$236.24	$0.00
73	$12,199.72	$37,972.37	$16,331.35	$19,926.16	$44,973.07	$33,743.30	$53,883.81	$31,973.22	$(533.20)	$264,884.40	$64,586.69	$200,297.71	$0.00
74	$3,178.72	$3,217.88	$2,929.53	$3,291.07	$2,661.41	$3,992.58	$4,022.53	$5,516.34	$0.00	$35,306.73	$12,893.27	$22,413.46	$0.00
75	$4,373.50	$31,686.16	$0.00	$12,305.92	$25,574.47	$51,809.64	$28,419.38	$60,663.21	$14,214.86	$229,047.14	$36,059.66	$192,987.48	$0.00
76	$13,300.00	$(16,000.00)	$12,305.91	$12,646.09	$(20,105.00)	$(4,847.00)	$0.00	$10,433.62	$(10,433.62)	$0.00	$0.00	$0.00	$0.00
77	$0.00	$23,443.22	$0.00	$0.00	$62,479.79	$0.00	$97,287.65	$0.00	$130,007.71	$364,773.37	$74,998.22	$289,775.15	$0.00
78	$26,247.70	$766.19	$18,875.01	$31,863.66	$(54,040.22)	$62,763.31	$(547,710.51)	$76,849.80	$(126,426.04)	$0.00	$36,834.89	$(36,834.89)	$0.00
79	$3,983.78	$0.00	$1,310.28	$2,158.95	$1,179.63	$875.25	$6,507.56	$201.59	$514.25	$20,844.40	$8,096.89	$12,747.51	$0.00
80	$(2,764.00)	$570.29	$(5,750.00)	$1,000.00	$(1,000.00)	$4,000.00	$0.00	$(4,000.00)	$(1,000.00)	$0.00	$1,750.00	$(1,750.00)	$0.00
81	$3.84	$8.81	$16.18	$7.40	$0.36	$143.56	$49.60	$40.78	$0.00	$320.10	$62.22	$257.88	$0.00
82	$48,413.18	$43,692.55	$34,686.91	$63,273.09	$17,741.44	$118,737.34	$88,575.91	$149,705.34	$6,876.56	$650,291.74	$170,695.15	$479,596.59	$0.00
83	$2,635.59	$2,107.71	$1,306.15	$1,874.47	$1,934.49	$2,739.62	$2,035.07	$2,728.47	$0.00	$26,306.30	$13,688.03	$12,618.27	$0.00
84	$0.00	$0.00	$0.00	$0.00	$172,920.00	$0.00	$0.00	$0.00	$0.00	$664,323.00	$491,403.00	$172,920.00	$0.00
85	$1,668.42	$430.69	$1,421.03	$366.03	$1,517.19	$6,209.88	$1,525.15	$(1,000.00)	$(304.39)	$30,686.70	$20,952.50	$9,734.20	$0.00
86	$4.79	$0.24	$10.61	$3.31	$3.31	$13.98	$0.20	$9.85	$0.00	$68.37	$30.22	$38.15	$0.00
87	$4,308.80	$2,538.64	$2,737.79	$2,243.81	$176,371.88	$8,963.48	$3,560.42	$1,738.32	$(306.98)	$721,384.37	$526,073.75	$195,310.62	$0.00
88	$1,088.52	$2,616.62	$2,302.96	$3,535.99	$2,769.98	$3,709.09	$2,449.73	$2,923.70	$0.00	$27,195.50	$9,504.05	$17,691.45	$0.00
89	$62,464.00	$63,616.00	$72,688.00	$67,008.00	$67,816.00	$16.00	$264.00	$0.00	$0.00	$335,752.00	$127,960.00	$207,792.00	$0.00
90	$78,047.22	$54,101.97	$62,432.45	$44,002.96	$39,346.87	$18,111.57	$18,368.68	$18,368.68	$0.00	$746,036.76	$545,405.55	$200,631.21	$0.00
91	$2,109.76	$92.86	$1,117.94	$2,746.57	$(3,200.00)	$7,021.10	$6,593.74	$(2,851.16)	$(350.33)	$38,631.48	$26,353.82	$12,277.66	$0.00
92	$2.01	$0.12	$13.15	$5.79	$0.40	$20.06	$0.28	$11.86	$0.00	$74.22	$22.68	$51.54	$0.00
93	$143,711.51	$120,427.57	$138,554.50	$117,299.31	$107,933.25	$28,877.82	$27,676.43	$18,452.78	$(350.23)	$1,147,689.96	$709,246.10	$438,443.86	$0.00
94	$2,519.12	$702.25	$453.87	$632.92	$309.04	$547.04	$905.28	$1,891.27	$128.14	$16,351.17	$11,483.61	$4,867.56	$0.00
95	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$381.84	$11,647.30	$0.00	$25,625.14	$13,596.00	$12,029.14	$0.00
96	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
97	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
98	$2,967.32	$0.00	$806.34	$408.45	$0.00	$350.10	$978.36	$0.00	$0.00	$7,677.58	$5,134.33	$2,543.25	$0.00
99	$(563.88)	$(226.94)	$(709.88)	$0.00	$0.00	$0.00	$1,500.00	$(2,000.00)	$0.00	$(50.00)	$1,200.00	$(1,200.00)	$0.00
100	$122.51	$0.24	$3.16	$0.79	$0.08	$2.25	$60.52	$4.22	$6.12	$245.91	$168.77	$77.14	$0.00
101	$4,995.57	$475.52	$563.37	$1,042.16	$309.12	$899.39	$3,826.00	$11,542.79	$134.26	$49,899.80	$31,582.71	$18,317.09	$0.00
102	$4,458.34	$3,919.88	$2,300.22	$3,842.58	$2,056.83	$7,582.18	$4,292.47	$7,150.31	$1,068.53	$53,523.50	$25,230.38	$28,293.12	$0.00
103	$96,178.48	$0.00	$11,160.73	$36,016.86	$70,008.25	$40,592.25	$70,026.79	$709,907.40	$14,525.01	$1,263,269.69	$310,992.40	$952,277.29	$0.00
104	$59,192.83	$32,000.00	$34,705.63	$40,731.37	$48,971.70	$41,840.54	$48,976.19	$221,231.38	$(7,049.04)	$640,000.00	$210,992.83	$429,007.17	$0.00
105	$10,269.62	$(4,724.29)	$2,847.25	$3,815.56	$5,526.07	$1,490.42	$4,699.24	$3,202.81	$(509.33)	$72,526.33	$51,543.31	$20,983.02	$0.00
106	$171.08	$70.28	$19.70	$71.03	$253.36	$226.86	$0.60	$270.66	$35.71	$1,372.22	$494.30	$877.92	$0.00
107	$170,270.35	$31,215.88	$51,033.53	$84,477.40	$126,816.21	$91,732.25	$127,995.29	$941,802.56	$7,581.28	$2,030,691.74	$599,253.22	$1,431,438.52	$0.00
108	$1,784.51	$2,587.11	$1,317.17	$2,241.97	$588.75	$2,221.67	$842.67	$1,346.71	$375.19	$17,432.13	$8,498.00	$8,934.13	$0.00
109	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$875.00	$0.00	$875.00	$0.00	$875.00	$0.00
110	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$454.48	$0.00	$454.48	$0.00	$454.48	$0.00
111	$(533.70)	$(540.89)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,490.59	$2,490.59	$0.00	$0.00
112	$96.98	$0.16	$13.01	$3.31	$74.68	$4.23	$0.16	$4.08	$9.18	$296.46	$187.81	$108.65	$0.00
113	$1,548.29	$2,241.39	$1,330.18	$2,245.28	$663.43	$2,225.90	$842.83	$2,680.27	$384.37	$21,548.66	$11,176.40	$10,372.26	$0.00
114	$2,802.99	$2,649.55	$1,790.86	$2,679.52	$849.00	$2,258.12	$1,161.67	$996.40	$0.00	$24,128.89	$14,393.32	$9,735.57	$0.00
115	$3,591.00	$0.00	$14,578.14	$28,263.00	$44,929.09	$122,975.00	$58,649.52	$163,435.90	$0.00	$449,516.65	$16,686.00	$432,830.65	$0.00
116	$10,697.84	$69,822.01	$12,474.89	$15,308.59	$17,313.62	$30,379.93	$19,955.41	$38,092.18	$(50.01)	$230,022.26	$96,497.65	$133,524.61	$0.00
117	$3,450.20	$11,311.49	$2,200.20	$3,787.55	$5,966.75	$7,290.20	$11,540.23	$(486.04)	$(1,450.48)	$62,611.62	$33,623.11	$28,988.51	$0.00
118	$4.98	$0.28	$13.32	$4.50	$0.28	$5.99	$62.88	$5.63	$0.00	$185.96	$93.36	$92.60	$0.00
119	$20,547.01	$73,783.33	$31,057.41	$50,043.16	$69,058.74	$162,909.24	$91,369.71	$202,084.07	$(1,350.39)	$766,465.38	$161,293.44	$605,171.94	$0.00
120	$3,228.81	$2,663.45	$2,169.29	$3,850.62	$1,972.40	$4,383.55	$3,002.54	$4,676.93	$0.00	$30,053.81	$9,998.48	$20,055.33	$0.00
121	$0.00	$1,500.00	$14,600.00	$4,590.00	$24,120.00	$18,530.00	$9,910.00	$24,740.00	$12,060.00	$110,050.00	$1,500.00	$108,550.00	$0.00
122	$0.00	$0.00	$0.00	$8,530.00	$(4,910.00)	$(4,080.00)	$0.00	$12,287.00	$(1,287.00)	$0.00	$0.00	$0.00	$0.00
123	$0.00	$28,454.00	$0.00	$0.00	$26,905.84	$0.00	$26,596.94	$0.00	$29,142.23	$111,099.01	$28,454.00	$82,645.01	$0.00
124	$7,304.00	$(7,043.50)	$10,985.34	$10,208.52	$(14,911.41)	$12,750.05	$(16,298.36)	$18,918.20	$(5,938.78)	$0.00	$7,564.44	$(7,564.44)	$0.00

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
125	$0.00	$143.23	$233.40	$116.70	$1,713.45	$2,450.70	$2,736.01	$74.27	$0.00	$7,467.76	$143.23	$7,324.53	$0.00
126	$0.00	$500.00	$0.00	$500.00	($500.00)	$3,500.00	($1,000.00)	($3,000.00)	$0.00	$0.00	$500.00	($500.00)	$0.00
127	$4.94	$0.32	$13.38	$5.48	$0.40	$99.46	$135.84	$142.22	$0.00	$408.54	$11.76	$396.78	$0.00
128	$10,537.75	$26,217.44	$28,001.41	$27,801.32	$35,250.68	$37,233.76	$25,174.97	$57,838.62	($393.55)	$259,079.12	$48,171.91	$210,907.21	$0.00
129	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
130	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
131	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
132	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
133	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
134	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
135	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
136	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
137	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
138	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
139	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
140	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
141	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
142	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
143	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
144	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
145	$7,568.46	$4,291.33	$2,326.08	$3,611.15	$2,664.53	$3,614.64	$2,654.25	$4,159.31	$0.00	$39,170.70	$20,140.74	$19,029.96	$0.00
146	$6,464.42	$2,179.64	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$8,644.06	$8,644.06	$0.00	$0.00
147	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
148	$9.12	$0.72	$21.57	$5.86	$0.40	$19.20	$0.28	$90.50	$0.00	$164.78	$26.97	$137.81	$0.00
149	$14,042.00	$6,471.69	$2,347.65	$3,617.01	$2,664.93	$3,633.84	$2,654.53	$4,249.81	$0.00	$47,979.54	$28,811.77	$19,167.77	$0.00
150	$422.15	$0.00	$0.00	$228.53	$560.92	$922.40	$1,105.71	$1,254.30	$0.00	$4,692.68	$620.82	$4,071.86	$0.00
151	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
152	$6,298.73	$6,494.73	$6,710.62	$6,969.05	$8,154.69	$8,132.89	$8,079.46	$6,429.69	$193.54	$81,584.93	$36,914.99	$44,669.94	$0.00
153	$20,583.41	$20,108.78	$19,992.27	$19,206.73	$22,313.34	$22,158.37	$22,283.30	$22,203.17	$913.51	$251,955.98	$122,885.29	$129,070.69	$0.00
154	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
155	$1,664.44	($1,432.22)	$709.36	$14.40	$0.00	$0.00	$5,500.00	$8,197.44	$135.32	$38,969.46	$24,412.94	$14,556.52	$0.00
156	$0.00	$0.04	$0.00	$0.00	$0.04	$0.04	$4.15	$0.08	$5.36	$9.67	$0.04	$9.63	$0.00
157	$28,968.73	$25,171.33	$27,412.25	$26,418.71	$31,028.99	$31,217.81	$36,968.55	$38,089.96	$1,242.37	$377,212.72	$184,834.08	$192,378.64	$0.00
158													
159	$1,066,023.84	$857,484.70	$674,274.72	$1,007,568.12	$1,422,999.71	$1,393,973.18	$745,319.35	$2,279,427.48	($6,579.96)	$15,228,869.65	$7,714,147.05	$7,514,722.60	$0.00
160													
161													
162													
163													
164													
165													
166													
167													
168													
169													
170													
171										Internal Staff Costs			
172										Res	$294,188.61		
173										C&i	$224,615.73		
174										Indirect	$69,358.76		
175										Total	$588,163.10		

Exhibit NM-18

I&M Discovery Request Response to CAC Set 1, Q2, 2014 Final Verified Savings

Program	End Note	Measures Implemented				Program Budget Expenditures				Gross Energy Impacts (kWh)				Gross Demand Impacts (kW)				NTG Ratio	Net kWh	Net kW
		Current Month	YTD	Planning Goal	% to Goal	Current Month Actuals	YTD	Budget	% to Goal	Current Month kWh Savings	YTD	Energy Savings Goal	% to Goal	Current Month kW Savings	YTD	Demand Savings Goal	% to Goal		YTD	YTD
CORE PROGRAMS																				
Residential Home Energy Assessment		0	1,632	2,106	77%	$7,143	$756,980	$787,357	96%	0	2,108,623	2,182,000	97%	0	230	924	25%	84%	1,771,244	193
Residential Low Income Weatherization		0	1,104	1,425	77%	$5,155	$975,379	$1,113,647	88%	5,146	1,481,320	1,524,000	97%	0	132	661	20%	100%	1,481,320	132
Residential Lighting		0	407,950	358,069	114%	$6,822	$855,233	$910,819	94%	0	14,836,964	15,685,000	95%	0	1,763	3,787	47%	50%	7,418,482	882
Energy Efficient Schools - Kits		62	3,820	6,048	63%	$32,482	$567,661	$586,561	97%	30,394	1,872,635	1,858,000	101%	0	0	495	0%	100%	1,867,017	0
Energy Efficient Schools - Audits		0	12	12	100%				N/A	0	502,983	92,112	546%	0	33	1	3300%	241%	1,212,189	80
C&I Rebate Programs		0	36,691	114,821	32%	$1,658	$2,576,019	$3,111,298	83%	0	20,849,641	35,000,000	60%	0	3,901	5,645	69%	81%	16,888,209	3,160
Subtotal		62	451,209	482,481	94%	$53,260	$5,731,272	$6,509,682	88%	35,539	41,652,167	56,341,112	74%	0	6,059	11,513	53%		30,638,461	4,446
CORE PLUS PROGRAMS																				
Appliance Recycling Program	7	260	3,879	3,137	124%	$43,270	$676,921	$649,077	104%	270,091	4,002,338	3,181,339	126%	34	506	943	54%	72%	2,881,683	365
Online Energy Check-up Program	8	71	5,395	6,882	78%	$8,765	$306,314	$338,585	90%	38,930	2,818,382	3,750,932	75%	3	245	262	93%	85%	2,395,625	208
Home Energy Reporting Program	9	94,295	96,278	100,000	96%	$1,433	$721,384	$735,348	98%	2,429,547	23,776,713	28,256,000	84%	169	2,092	1,930	108%	100%	23,776,713	2,092
Peak Reduction	10	0	8,440	9,000	94%	$18,103	$1,147,690	$1,047,129	110%	0	62,367	0	#DIV/0!	0	5,295	4,814	110%	100%	62,367	5,295
Renewables/Demo. Residential		1	2	5	40%	$8,757	$37,444	$134,545	28%	3,804	19,079	84,090	23%	1	3	6	53%	54%	10,303	2
Renewables/Demo. Commercial		1	2	2	100%	$2,920	$12,456	$44,848	28%	18,953	21,859	28,030	78%	3	4	2	181%	54%	11,804	2
Home Weatherization		1,694	5,973	6,929	86%	$156,582	$650,292	$1,457,738	45%	441,311	1,401,869	3,425,430	41%	60	206	1,047	20%	72%	1,009,345	148
Res. New Construction		33	204	449	45%	$31,440	$264,884	$333,751	79%	50,895	369,415	911,804	41%	40	237	77	308%	80%	295,532	190
Energy Efficient Products		267	1,063	2,816	38%	$57,445	$259,079	$630,916	41%	190,794	524,551	1,294,742	41%	40	149	3,542	4%	52%	272,767	77
C&I Incentives Program		124	238	34	700%	$616,544	$1,805,460	$1,987,002	91%	8,753,455	15,304,263	17,000,000	90%	0	814	4,888	17%	99%	15,151,220	806
C&I Audit Program		36	67	139	48%	$200,734	$766,465	$774,551	99%	457,218	1,292,080	1,430,770	90%	20	207	778	27%	81%	1,046,585	168
C&I Small Business Direct Install		72	206	175	118%					993,024	2,753,961	3,000,000	92%	0	0	n/a		100%	2,753,961	0
C&I Retro-Commissioning Lite Program		33	57	70	81%	$949,384	$2,030,692	$2,187,808	93%	12,047,037	20,685,678	20,000,000	103%	0	0	n/a		86%	17,789,683	0
C&I HVAC Optimization Program		35	35	357	10%	$3,065	$21,549	$435,669	5%	12,985	12,985	65,000	20%	2	2	528	0%	86%	11,167	2
EECO (Volt Var) Residential		9	9	9	100%	$34,020	$334,734	$396,483	84%	134,916	1,312,960	3,801,405	35%	13	130	1,086	12%	100%	1,312,960	130
EECO (Volt Var) Commerical						$4,205	$41,372	$49,000	84%	146,159	1,422,374	4,118,189	35%	14	140	1,177	12%	100%	1,422,374	140
Subtotal		96,931	121,848	130,004	94%	$2,136,667	$9,076,736	$11,202,454	81%	25,989,118	75,780,873	90,347,731	84%	399	10,030	21,080	48%		70,204,089	9,624
INDIRECT COSTS																				
Staff Development & Prof. Organizations						$3,833	$34,595	$95,000	36%											
Computer System Development						$14,963	$126,164	$235,000	54%											
Marketing & Customer Awareness						$41,161	$195,668	$300,000	65%											
New Program Development						$0	$0	$210,000	0%											
General EE Management & Collaboration						$0	$0	$105,000	0%											
Codes Work						$0	$0	$100,000	0%											
MPS & Action Plan						$0	$0	$75,000	0%											
Evaluation & Related						$4,250	$56,624	$140,000	40%											
Subtotal						$64,207	$413,051	$1,260,000	33%											
PORTFOLIO TOTALS																				
Total Residential		96,692	535,749	496,875	108%	$411,417	$7,553,995	$9,121,956	83%	3,595,828	54,587,216	65,954,742	83%	360	10,989	19,574	56%		44,555,358	9,714
Total C&I		229	37,102	115,435	32%	$1,778,510	$7,254,013	$8,590,180	84%	22,428,830	62,845,824	80,734,101	78%	40	5,101	13,019	39%		53,533,231	4,357
Total Portfolio		96,993	573,057	612,485	94%	$2,254,134	$15,221,059	$18,972,136	80%	26,024,658	117,433,040	146,688,843	80%	399	16,089	32,593	49%		100,842,550	14,070

Exhibit NM-19

I&M Discovery Request Response to CAC Set 1, Q2, EM&V Cost Per Program

2015 Indiana EE Programs	Total 2015 Budget	kWh Estimate	EM&V Estimate	2015 EM&V Budget
Residential Peak Reduction	824,835	112,014	50,000	29,694
Schools Energy Education	348,803	1,730,874	50,000	19,882
Residential Appliance Recycling	648,693	2,800,000	112,467	32,435
Residential EE Products - EE Products Componen	371,264	1,294,742	11,250	11,138
Residential EE Products - Lighting Component	1,072,014	14,770,000	50,000	48,241
Residential Home Energy Reporting	1,448,875	33,000,000	40,000	34,773
Residential Online Audit	676,785	3,865,320	46,000	35,870
Residential New Construction	492,422	731,022	50,000	28,560
Residential Weatherization	1,757,283	3,425,430	85,998	52,718
Residential Low Income Weatherization	1,205,906	1,018,912	85,998	51,854
Commercial & Industrial Audit & SBDI (Audit)	164,976	1,430,770	22,500	13,198
Commercial & Industrial Audit & SBDI (SBDI)	658,066	3,000,000	22,500	36,194
Commercial & Industrial Custom	1,443,917	12,000,000	100,000	72,196
Commercial & Industrial Prescriptive	2,763,894	35,000,000	97,547	129,903
Electric Energy Consumption Opt. Indiana			75,000	75,000
Electric Energy Consumption Opt. Michigan				25,000
Total	13,877,733		899,260	696,655