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BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a	)	
Ameren Missouri's 2nd Filing to Implement	)	**File No. EO-2015-0055**
Regulatory Changes in Furtherance of Energy	)	
Efficiency as Allowed by MEEIA	)	

REBUTTAL TESTIMONY OF PHILIP MOSENTHAL

ON BEHALF OF

NRDC

March 20, 2015

Q. Please state your name and business address.

A. Philip H. Mosenthal, Optimal Energy, Inc., 10600 Route 116, Hinesburg, VT 05461.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Natural Resources Defense Council (NRDC). All work developing my testimony has been completed by me or under my direction.

Q. How are you employed?

A. I am the founding partner in Optimal Energy, Inc., ("Optimal Energy") a consultancy specializing in energy efficiency and utility planning. Optimal Energy advises numerous parties including utilities, non-utility program administrators, government, and environmental groups.

Q. Tell me about your qualifications and experience?

A. I have 30 years of experience in all aspects of energy efficiency, including facility energy management, policy development and research, integrated resource planning, cost-benefit analysis, and efficiency and renewable program design, implementation and evaluation. I have developed numerous utility efficiency plans, and designed and evaluated utility and non-utility residential, commercial and industrial energy efficiency programs throughout North America, Europe and China.

I have also completed or directed numerous studies of efficiency potential and economics in many locations, including China, Colorado, Kansas, Maine, Massachusetts, Michigan, New England, New Jersey, New York, Quebec, Texas, and Vermont. These studies ranged from high level assessments to extremely detailed, bottom-up assessments evaluating thousands of measures among numerous market segments. Recent examples of the latter are analyses of electric and natural gas efficiency and renewable potential along with the development of suggested programs for New York State, on behalf of the New York State Energy Research and Development Authority (NYSERDA).

I have served as a lead advisor for business energy services in Rhode Island and Massachusetts on behalf of the Energy Efficiency Resource Management Council and the Energy Efficiency Advisory Council, respectively, overseeing and advising on utility program administrator's plans, program designs, implementation and performance, in these leading states.

I have been actively engaged in the Illinois Stakeholder Advisory Group (SAG) since its inception, representing the People of Illinois on behalf of the Illinois Office of the Attorney General. I have also been involved in the past few years on issues in Missouri related to KCP&L's and Ameren's IRP and MEEIA filings, as well as a witness on behalf of NRDC, the Sierra Club and Renew Missouri in various Ameren and KCPL&L dockets.

Prior to co-founding Optimal Energy in 1996, I was the Chief Consultant for the Mid-Atlantic Region for XENERGY, INC. (now DNV-GL). I have a B.A. in Architecture and an M.S. in Energy Management and Policy, both from the University of Pennsylvania.

Q. Have you previously testified before this Commission?

A. Yes. I submitted direct and rebuttal testimony in the most recent Ameren UE IRP docket, EO-2011-0271, and rebuttal testimony in docket EO-2012-0142. In addition, I submitted rebuttal testimony in the current KCP&L MEEIA filing docket, EO-2012-0009.

Q. Please summarize your Testimony.

A: First, I will argue that Ameren's 2016-2018 MEEIA savings targets are significantly below the level of all cost-effective efficiency called for by the MEEIA rules. In particular, I will argue that the measure-level potential from the EnerNOC potential study significantly underestimates the actual cost-effective potential in Ameren's territory, that the potential study then inappropriately and significantly lowers the measure-level potential study to estimate a "program potential," and that Ameren inappropriately reduces the program potential when arriving at its proposed goals in the MEEIA plan. The result of these underestimates are proposed targets that are significantly below the levels envisioned in the MEEIA rules, that are cost-effectively achievable, and that Ameren is currently achieving.

Second, I argue that Ameren has primarily focused on simply continuing its current programs at lower levels of savings than are currently being achieved. I argue further that Ameren has not investigated new programs or best practices in program design that would allow them to go deeper and achieve more participation than would be possible with the current program designs. I give examples of some of the many ways

that Ameren could improve program design or add programs that would allow them to achieve significantly higher than past or proposed savings levels.

Finally, I argue that Ameren's proposal to use self-adjusting savings targets for the purpose of determining the performance incentive undermines the whole purpose of the performance incentive in that it eliminates the risk that Ameren may not reach the target and get the full incentive. Further, I argue that not including true-up mechanisms to adjust the throughput disincentive based on EM&V results has led to over-recovery of the throughput disincentive in the first MEEIA cycle and will likely continue to do so in the second MEEIA cycle. I suggest that a decoupling or "true-up" mechanism may be a desirable way to resolve the contentious issues relating to the current throughput disincentive. I argue further that the proposed cost recovery and incentive mechanisms, which can provide Ameren shareholders with considerable benefit, are not justified given the low levels of risk and targets Ameren is proposing.

MEEIA Plan Savings Targets

Q: What are the savings targets that are proposed in the MEEIA Plan?

A: The table below shows Ameren's proposed costs and savings for its 2016-2018 efficiency activities.[1] Ameren plans on saving an average of 0.4% of total electric sales per year.

	2016	2017	2018
Cost	$42,828,113	$43,488,272	$48,145,011
Savings (MWh)	136,720	134,333	155,329
% of load	0.4%	0.4%	0.4%
$/MWh	$313	$324	$310

[1] Ameren 2016-2018 MEEIA Plan. Page 6

Q. How do Ameren's savings goals compare to the levels achieved in other states?

A. Ameren's MEEIA savings targets represent on average 0.39% of their total electric sales. As noted in the table below, savings are lower than those achieved in 2013 by 33 of the 50 states, including Missouri. Since the table represents statewide averages and many states have public or cooperative utilities that do little or no DSM, these figures are generally significantly lower than the best performing utilities within each state. Also note that the EnerNOC potential study's program-level RAP scenario estimated the total potential at about 0.6% of load per year. The fact that 24 of 50 states are currently achieving higher levels of savings than 0.6% provides further evidence that the EnerNOC study significantly underestimated potential.

Savings as a % of load by state[2]

1	Rhode Island	2.09%
2	Massachusetts	2.05%
3	Vermont	1.78%
4	Arizona	1.74%
5	Hawaii	1.67%
6	Michigan	1.51%
7	Oregon	1.43%
8	Washington	1.35%
9	California	1.25%
10	New York	1.13%
11	Iowa	1.06%
12	Minnesota	1.04%
13	Illinois	0.99%
14	Maryland	0.97%
15	Pennsylvania	0.97%
16	Connecticut	0.97%
17	Wisconsin	0.90%
18	Ohio	0.89%
19	Colorado	0.88%

[2] Gilleo, Annie, et al. The 2014 State Energy Efficiency Scorecard. ACEEE. October 2014.

20	Utah	0.87%
21	Nevada	0.81%
22	Idaho	0.78%
23	Maine	0.78%
24	Montana	0.65%
25	Indiana	0.59%
26	New Jersey	0.56%
27	New Hampshire	0.56%
28	North Carolina	0.55%
29	New Mexico	0.54%
30	Kentucky	0.52%
31	Missouri	0.49%
32	Arkansas	0.49%
33	District of Columbia	0.47%

Many states have continued to increase their savings levels. For example, in 2014, Massachusetts and Rhode Island saved 2.6% and 3.4% of load, respectively.[3,4] In other words, these States, last year, achieved between 6.5 and 8.5 times more savings than Ameren claims is achievable in its next MEEIA plan. Both of these States plan to continue aggressive efficiency efforts in the 2016-2018 timeframe, despite facing similar constraints imposed by new and even more aggressive codes and standards than Missouri. Further, these States have a longer and deeper history of efficiency programs than Missouri and are therefore more likely to run into problems with diminishing returns. Even Missouri, prior to the first MEEIA plan and ramp up in DSM efforts, achieved higher savings as a percent of load statewide in 2011 than what Ameren claims is realistically achievable in 2016-18.

[3] MA 4th Quarter 2014 Program Administrator's Data
[4] RI 2014 4th Quarter Report

Q. How do Ameren's savings goals compare to the levels of savings achieved in past years?

A. Ameren's savings goals are significantly lower than savings levels it is already achieving. In 2014, Ameren achieved evaluated net savings of 345 GWh. This is over 2.5 times higher than the 137 GWh that Ameren proposes in its 2016 MEEIA plan. Ameren's current programs are starting to ramp up and gain traction in the marketplace. The pace of program improvements is increasing with experience, capability, and market transformation efforts. Rather than building on the success of the first MEEIA effort, Ameren is instead proposing targets in its next MEEIA plan that represent a significant reduction in program activity.

Much more can be achieved. As an example, see the graph on page 28 below showing the ramp up of planned program activity in Massachusetts and Rhode Island after laws passed requiring significant additional energy savings off of an already significant base. When the laws were passed, Rhode Island and Massachusetts were already capturing about 1.0% or more annual savings as a percent of load. The laws resulted in significant increases in efficiency above this baseline starting in 2009 in Rhode Island and 2010 in Massachusetts. The graph shows the planned ramp up in portfolio savings that the Massachusetts and Rhode Island utilities committed to, and for which they have largely met or surpassed. As can be seen, the slope of this ramp is significant, and roughly consistent with the MEEIA rules targets. The chart shows that Ameren's proposal of not only much savings levels, but also virtually no improvement over time, contrasts dramatically with what has happened in these other states.

Q. How do Ameren's savings goals compare to the estimates of realistically achievable potential (RAP) and maximum achievable potential (MAP) found by the potential study?

A: Despite EnerNOC's potential study being unreasonably low, Ameren's savings targets in its proposed MEEIA plan are lower still. As such, the proposal clearly violates the MEEIA rule's intent to pursue all cost-effective efficiency.

The potential study estimates the measure program-level RAP and MAP. The measure-level potential estimates the achievable potential from all measures that are cost effective, including estimated take rates (i.e. program participation rates). The program potential maps the measure-level potential onto a specific set of assumed programs. The program-level potential is significantly lower than the measure-level potential, for reasons to be discussed in more detail below. However, even the much lower program-level RAP estimate is still significantly above the proposed targets in the MEEIA plan. The table below shows the absolute savings and the savings as a percent of load for 2016-2018 for all scenarios in the potential study as well as the proposed savings under the MEEIA Plan.

		2016	2017	2018	TOTAL
GWh Saved	Measure-level MAP	510	323	345	**1,178**
	Measure-level RAP	339	222	245	**806**
	Program-level MAP	251	244	273	**768**
	Program-level RAP	174	172	193	**539**
	MEEIA Plan	137	134	155	**426**
% of Load	Measure-level MAP	1.70%	1.00%	1.10%	**3.80%**
	Measure-level RAP	1.10%	0.70%	0.80%	**2.60%**
	Program-level MAP	0.80%	0.80%	0.90%	**2.50%**
	Program-level RAP	0.60%	0.50%	0.70%	**1.80%**
	MEEIA Plan	0.40%	0.40%	0.40%	**1.20%**

As seen, there are very large differences between the scenarios, with the program-level RAP being more than 50% lower than the measure-level MAP. For reasons to be discussed, Ameren's savings goals should reflect the measure-level scenarios as the best representative of all-cost effective efficiency required by the MEEIA rules. However, as shown above, Ameren's proposed MEEIA goals are another 20% lower than even the lowest estimate of potential from the potential study.

Q. Why are the potential study's adjustments to the measure-level potential inappropriate?

A: As described above, the EnerNOC potential study decreases the cumulative 2016-2018 measure-level efficiency potential from the above estimates by more than 30% to arrive at the "program potential." Three main reasons are offered for this adjustment[5]:

1. A 25% reduction in the business sector potential for offices and schools to represent the potential associated with the public sector;
2. The removal of some of the more expensive yet cost-effective measures to account for the added administrative costs from operating actual utility programs; and
3. A change in measure mix due to vaguely defined "program delivery factors"

None of these adjustments are appropriate. First, in going from measure-level potential to program potential, EnerNOC removed "twenty-five percent of measure-level potential from offices and schools to represent the potential that is associated with the public sector."[6] Ameren justified this decision by stating, "Ameren programs do not

[5] Ameren 2014 IRP. Chapter 8 Appendix B3, page 6-1 – 6-2.
[6] Ameren 2014 IRP. Chapter 8 Appendix B3, page 6-2

target public sector buildings."[7] However, there is no need to exclude the public sector from efficiency programs – institutional buildings pay electric bills and, thus, should have access to the same benefits as other ratepayers. In fact, according to the rate tariff filed as part of this docket, "business energy efficiency programs are available uniformly to all customers qualifying for service under Service Classifications Small General Service Rate 2(M), Large General Service Rate 3(M), Small Primary Service Rate 4(M), Large Primary Service Rate 11(M), or Large Transmission Service Rate 12(M)."[8] This makes it clear that public sector entities are eligible for participation and Ameren would presumably be claiming savings for this participation, especially given its current proposals to lock in net to gross ratio assumptions.

Although not made explicit in the potential study or MEEIA application, it is my understanding that one of the reasons for removing the public sector potential is that certain federal and local goals to increase efficiency in public sector buildings already exist and Ameren is assuming these buildings would be free riders. In reality, public sector buildings are highly budget constrained, have a hard time implementing even those projects with very attractive paybacks due to budget constraints and long backlogs of needed repairs, and often are unable to meet these goals. Indeed, multiple evaluations of public sector programs in states with the same federal mandates than Missouri have found fairly high net-to-gross ratios. For example, a recent evaluation in Illinois found the NTG ratios for Ameren's public sector participants in its C&I custom and standard

[7] Ibid
[8] Ameren MEEIA Application. Appendix D. Page 2.

(prescriptive) programs were estimated to be 0.94 and 0.97, respectively.[9] Regardless of whether some of the potential public sector customers might represent free-riders, it is clear that this sector is eligible to participate in Ameren's MEEIA business programs unless they qualify under the opt-out provisions, and Ameren would naturally count these savings in their programs. Therefore, the potential must be included in the EnerNOC estimates and pursued by Ameren. Including the public sector would cause a significant increase in the savings from the program-level potential estimates in the EnerNOC study.

The argument that the more expensive measures had to be removed to account for the administrative costs not included in the measure-level RAP is also not credible. Importantly, the TRC of the program portfolio for RAP is estimated at 1.53 for the 2016-2018 MEEIA Plan cycle.[10] This level of cost effectiveness means that program costs could increase by almost 50% and the overall portfolio would still remain cost-effective. Therefore, it is hard to believe that significant amounts of incrementally cost-effective measures had to be removed from the measure-level potential in order to design programs that pass cost-effectiveness screening. Further, one of the main technologies that EnerNOC removed between the measure-level potential and the program potential is linear LEDs replacing linear fluorescent lamps in commercial settings. While it is true that these measures may have been marginal 2-3 years ago, costs have come down rapidly – from almost $100 a few years ago to $20 or less today. At the same time, bulb efficiency has significantly improved. As a result, this measure is typically highly cost-effective and achieves significant penetration in other jurisdictions where it is even

[9] ADM Associates, Evaluation of Illinois Energy Now Public Sector Custom, Standard, and New Construction Incentives Programs, June 2011 through May 2012, Prepare for Illinois Department of Commerce and Economic Opportunity, October 2013. Tables ES-3, ES-4. Page ES-3.
[10] Ameren 2016-2018 MEEIA Plan. Page 7.

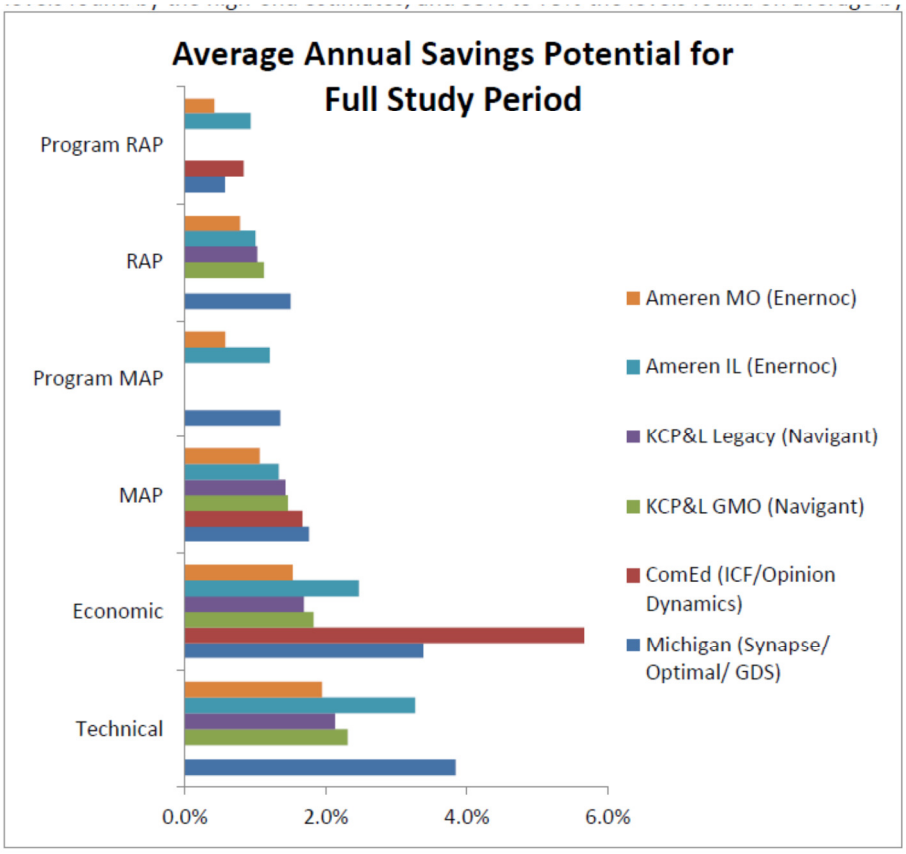
offered prescriptively. According to Ameren Missouri's screening project files, they have already given rebates for linear LED lighting in at least one project. This provides a concrete example of why the program potential is a significant underestimate – even though linear LED lighting has been eliminated from the EnerNOC potential study, Ameren's actual program continues to rebate the technology and claim the associated savings.

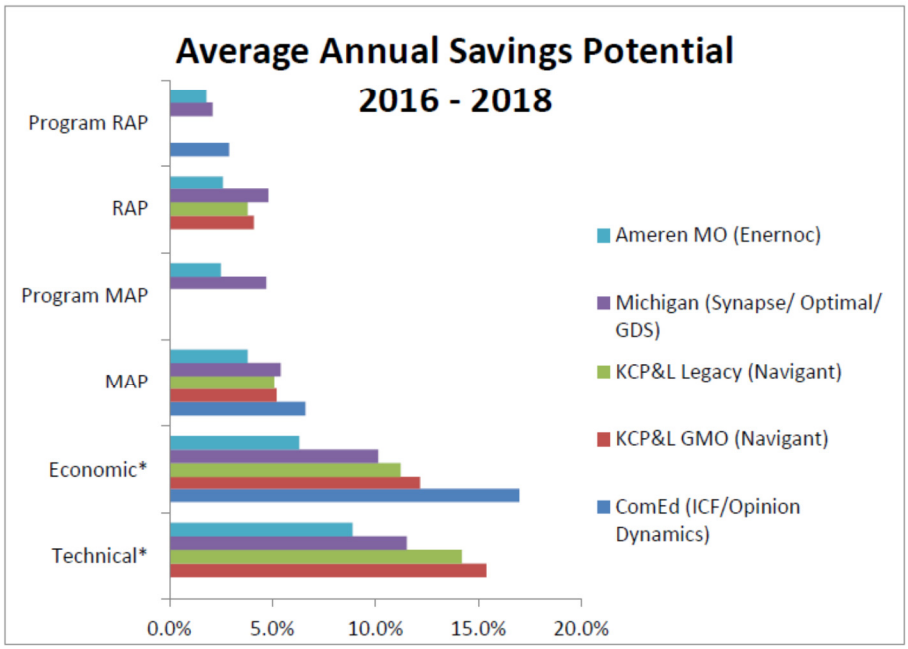
Lastly, Ameren does not explain which "program delivery factors" caused a further reduction in potential. However, the definition of "achievable potential" is that there exists some set of programs that can achieve that potential. The EnerNOC measure-level MAP and RAP scenarios already contain estimated "take rates" for well designed programs. EnerNOC should not further reduce the potential due to the vague and undefined concept of "program delivery factors." Rather, Ameren should consider other program strategies to capture these measures at their full achievable potential level, if necessary.

Q. Are EnerNOC's estimates of measure-level potential are reasonable?

A: The estimates of measure-level RAP and MAP, even before the unnecessary downward adjustments for program potential, still understate the true achievable cost effective efficiency potential. For the purposes of comparison, the charts below show the results of recent similar potential studies in the Midwest. These charts provide a comparison of recent potential study estimates in nearby jurisdictions. As these charts suggests, Ameren Missouri's estimates of annual savings are lower than other recent potential studies. In comparing these studies, high-end assessments found cumulative

savings potentials of between 166% and 371% of EnerNOC's estimated potential. On average, the EnerNOC study found a potential of only 65% when compared to other state studies. Comparing only Ameren Missouri's next MEEIA plan cycle with other state studies, the EnerNOC study estimates potential of 37% to 62% of the levels found by the other states' high-end estimates and 55% to 79% of the average levels.





There is clear evidence that the majority of states are already capturing savings well in excess of Ameren's purported "realistically achievable potential." In fact, Ameren's own 2014 savings are 40% higher than EnerNOC's estimate for maximum achievable program potential in 2016. These two facts together confirm that the EnerNOC study is a significant underestimate of the true potential. It is not plausible that Ameren managed to dramatically exceed the entire maximum achievable potential in only its first two years of running MEEIA programs, especially given the limited nature and budgets associated with its current MEEIA portfolio.

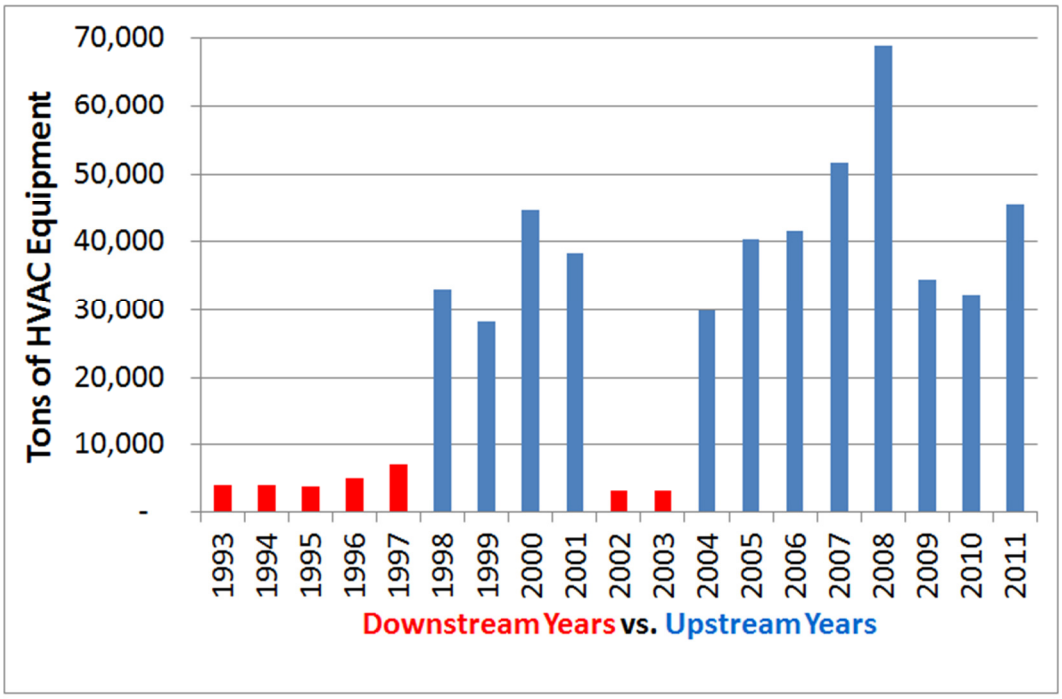
Q. What specific factors do you think caused EnerNOC to underestimate the available potential?

A. One significant contributor to EnerNOC's low potential estimate is its approach for estimating take rates. Take rates are the maximum rates at which cost-effective efficiency measures will be adopted by the public. In the potential study, EnerNOC

estimated that take rates for the RAP scenario are between 29% and 39% for the residential sector and 38% and 49% for the commercial sector.[11] These numbers are well below documented program participation rates in a recent ACEEE study that examined take rates throughout the country.[12] The study found that efficiency programs have increased the market share of Energy Star products to nearly 90%, participation rates in the absence of budget caps for small business direct install programs to between 60-80%, and participation rates for commercial custom programs targeting larger customers to nearly 90% over 3-4 years. These numbers are significantly higher than the rates used for the potential study and are one of the primary reasons the EnerNOC potential is lower than the savings estimated in other studies and that are already being achieved by Ameren.

Further, it does not appear that the potential study looked at alternate ways to increase take rates. Experience in other jurisdictions indicates that upstream programs can significantly increase program participation. The graph below plots a Southern California HVAC program as it moved from downstream to upstream, back to downstream, and then back to upstream .[13]

[11] Ameren 2014 IRP. Chapter 8, Appendix B, Volume 1, page 8.
[12] York, Dan, Neubauer, Max, et al. Expanding The Energy Efficiency Pie: Serving More Customers, Saving More Energy Through High Program Participation. January 2015.
[13] Daniel Cornejo, Energy Solutions



As seen, participation is an order of magnitude higher during upstream years. By not taking into account various program design ideas, such as upstream programs, to increase take rates, EnerNOC and Ameren are significantly underestimating the true achievable potential. It appears that EnerNOC simply assumed that Ameren would continue with their current strategies, even when more aggressive strategies consistent with national best practices could provide more cost-effective savings.

Q. What factors does Ameren cite to justify putting forth goals that are significantly lower than both their potential estimate and what they are currently achieving?

A. Ameren cites three main reasons for significantly lowering the goals from the potential study. These are:

1. Evaluation, Measurement, & Verification results from the 2014 programs have caused a net decrease in the amount of gross savings able to be claimed per measure.
2. Avoided costs have decreased, causing some marginally cost effective measures to no longer be cost-effective.
3. New codes and standards are taking effect that will decrease the savings available from efficiency. Most notably Ameren claims that codes and standards have meant that CFLs are no longer cost-effective, causing a large increase in the cost of residential savings.

As discussed below, none of these arguments are convincing.

Q. Describe the impact of evaluation, measurement and verification activities on 2014 program savings.

A: The EM&V results contained a mixture of upward and downward revisions, the sum total being a relatively small downward revision in 2014 savings. In the 2014 IRP, Ameren provided the following table showing the impact of applying the 2014 EM&V results to the 2016-2018 potential.

Cumulative Savings (% of Baseline)	2016	2017	2018
Measure-Level RAP, Pre EM&V[14]	1.10%	1.80%	2.60%
Measure-Level RAP, Post EM&V[15]	1.04%	1.73%	2.47%

[14] Ameren 2014 IRP. Chapter 8, page 9.
[15] Ameren 2014 IRP. Chapter 8, page 11.

As seen, EM&V has a fairly minor impact, creating a 5% reduction in cumulative 2018 savings. Further, the total potential found remains well above the savings targets in the proposed MEEIA plan and, by definition, is only a subset of the maximum achievable potential that Ameren, consistent with MEEIA's goal of pursuing all cost-effective efficiency, should be pursuing. Finally and as mentioned, Ameren's 2014 savings alone were more than 2.5 times the proposed 2016 savings and these figures reflect post-EM&V estimates of fully evaluated net savings. It is not possible to cite EM&V impacts as a major factor for a reduction from numbers that already include that same impact.

Q. Describe the impact of lower avoided costs on Ameren's efficiency portfolio

A. Ameren states that the lower avoided costs in the 2016-2018 time period result in significantly lower savings, as it is no longer able to promote marginally cost-effective measures. However, in their January 16, 2015 stakeholder presentation, Ameren states that only 12 out of 194 measures that passed in 2012-2015 now fail with the updated avoided costs. By definition these 12 measures were the least cost-effective measures being promoted and, thus, were unlikely to have any significant penetration or contribution to Ameren's overall portfolio. Removing the 6% of measures that were the least cost-effective in 2012-2015 would not noticeably contribute to a 66% drop in savings in the efficiency potential. Further, these adjustments are asymmetric. Ameren eliminated measures that no longer pass the TRC due to lower avoided costs, but does not appear to have evaluated any new measures that may now be cost-effective, for which costs have declined, or for which performance has improved.

Q. How will codes and standards impact Ameren's ability to deliver efficiency savings?

A. Energy efficiency program administrators must constantly be aware of changing codes and standards in their jurisdictions. As the code cycle progresses, the baseline case can become more efficient, potentially eroding some of the savings a program administrator can claim. If the program administrators are not able to raise the qualifying efficiency level for rebates, some measure savings will likely drop. However, in the past, equipment efficiency has increased at roughly the same level as codes, keeping available savings similar. In general, code setters follow the market and set codes at a level that is consistent with other existing items on the market exceeding code. As an example, as EISA has begun phasing out traditional incandescent lightbulbs, LEDs have become significantly cheaper and more efficient. Thus, code tends to follow the market towards higher efficiency, and savings from efficiency have not historically dropped due to more stringent codes and standards.

More importantly, all known codes and standards were already included in the EnerNOC potential study. Ameren's MEEIA application shows the following table, as an explanation for the decline in potential.[16]

[16] Ameren 2016-2018 MEEIA Plan. Page 24

Today's Efficiency or Standard Assumption | 1st Standard (relative to today's standard) | 2nd Standard (relative to today's standard)

End Use	Technology	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Cooling	Central AC	SEER 13													
	Room AC	EER 9.8		EER 11.0											
	Evaporative Central AC	Conventional													
	Evaporative Room AC	Conventional													
Cooling/Heating	Heat Pump	SEER 13.0/HSPF 7.7			SEER 14.0/HSPF 8.0										
Space Heating	Electric Resistance	Electric Resistance													
Water Heating	Water Heater (<=55 gallons)	EF 0.90			EF 0.95										
	Water Heater (>55 gallons)	EF 0.90			Heat Pump Water Heater										
Lighting	Screw-in/Pin Lamps	Incandescent		Advanced Incandescent - tier 1 (20 lumens/watt)						Advanced Incandescent - tier 2 (45 lumens/watt)					
	Linear Fluorescent	T12	T8												
Appliances	Refrigerator/2nd Refrigerator	NAECA Standard		25% more efficient											
	Freezer	NAECA Standard		25% more efficient											
	Dishwasher	Conventional (355kWh/yr)	14% more efficient (307 kWh/yr)												
	Clothes Washer	Conventional (MEF 1.26 for top loader)			MEF 1.72 for top loader			MEF 2.0 for top loader							
	Clothes Dryer	Conventional (EF 3.01)			5% more efficient (EF 3.17)										

However, this same table is also in the original EnerNOC potential study, and the study states "we implemented assumptions for known future equipment standards as of June 13."[17] Therefore, the RAP and MAP estimates in the potential study already accounted for all known future standards. By further reducing EnerNOC's RAP and MAP estimates based on these standards, Ameren is double counting their impact on the achievable cost effective efficiency available in its service territory.

In addition, Ameren seems to imply that much of the savings reduction from the potential study to the IRP is due specifically to EISA's effect on the residential lighting poitential. However, the potential study already takes this into account, noting that "savings from general purpose lamps decrease over time due to the EISA standards, which increase the efficiency of the baseline technology …"[18]

Finally, the new EISA standards are having less of an impact than was originally anticipated. The largest residential lighting impact from the EISA standards is the phase out of A-type incandescent bulbs. However, there has been significant uncertainty as to

[17] Ameren 2014 IRP. Chapter 8, Appendix B, Volume 3, page 2-15
[18] Ameren 2014 IRP. Chapter 8, Appendix B, Volume 3, page 6-2

how fast this phase out would occur in the real world and whether the new baseline would be the more efficient CFL bulbs or the relatively less efficient halogen incandescents. The most recent research indicates that the actual phase-out is occurring more slowly than expected and that the less efficient halogen incandescent bulbs are gaining significant traction as the baseline. A recent study by Northeast Energy Efficiency Partnerships (NEEP) on lighting in the northeast finds that "the A-line lighting market has not been transformed and many inefficient options still exist for customers."[19] The study finds further that old incandescent bulbs still have a 34.7% market share, with halogens claiming an additional 26%. The market share would likely be even higher in the Midwest, which lacks long a history of energy efficiency programs. The study's results imply that the residential baseline in the 2016-2018 period will most likely consist of a mixture of halogens and incandescents, rather than only halogens or CFLs, as Ameren is assuming. The lower baseline, then, will increase the cost-effectiveness of CFLs and LEDs as well as the efficiency potential from lighting programs.

Further, the study projects significant continued price declines for LEDS. The price of an A19 60W equivalent LED lamp, for example, fell from $13.16 at the start of 2014 to $9.12 by the end of August. The price is expected to fall further to $6.81 by the end of 2015. As a result of the price decline, NEEP projects that LEDs will become more cost-effective than CFLs in 2016. Neither the EnerNOC potential study nor Ameren's MEEIA plan goals took into account this precipitous decline in LED cost. The LED cost decline combined with a higher baseline means that there will be significantly more lighting savings available for significantly less money than either EnerNOC or Ameren has predicted.

[19] Northeast Residential Lighting Strategy: 2014-2015 Update. December 2014. Page 4.

Q. What does Ameren's 2014 lighting evaluation say about the lighting market?

A. Ameren's lighting evaluation backs up the findings in the NEEP lighting study. For example, it finds a high persistence of old standard incandescent bulbs, with 52% of the sampled retailers continuing to sell 100W and/or 75W incandescent bulbs at the end of 2014, even though EISA phased them out in 2012 and 2013, respectively. The Ameren evaluation study also estimates the 2014 CFL saturation rate at 31%. Stated differently, 31% of residential screw-in sockets contain CFL bulbs. While this is significantly higher than the 2011 saturation rate of 21%, there is still large room for improvement. Since LED saturations remain small (a recent Massachusetts study found saturation rates of 2%[20] in 2013), this implies that the majority of residential sockets still have incandescent or halogen bulbs, offering significant extra potential from CFLs.

Q. How has Ameren screened CFLs to determine that they are not cost-effective?

A. Ameren's screening of CFLs and other lighting measures are full of questionable inputs and fail to account for operational and maintenance savings or, as discussed, the fact that the EISA phase-in is taking longer than expected. These are key points, since Ameren has stated that the most significant reason for the decline in the MEEIA plan's savings is that most CFLs fail the TRC cost-effectiveness test. In fact, Ameren is not planning any standard A-base CFLs in 2016-20 and will instead only promote LED technology.

[20]NMR Group. Results of the Massachusetts Onsite Lighting Inventory. 6/07/2013. Page iv. http://ma-eeac.org/wordpress/wp-content/uploads/Onsite-Lighting-Inventory-Results-Final-Report-6.7.13.pdf

Although switching from CFLs to LEDs may raise the cost of the program slightly, it should not lower the available savings. In fact, since LEDs achieve higher savings than CFLs, the potential should actually increase after the switch, thereby eliminating this as a plausible reason for the savings declines.

It also appears from Ameren's DSMore files that they are not performing the cost-effectiveness screening properly. For example, the DSMore cost-effectiveness ratio for 30-watt CFLs is 0.34. However, this ratio appears to be due in large part to an assumed cost of $9.27 per bulb. A quick web search tells you that this amount is more than double the actual price of a 30-watt CFL and more in line with current LED costs, as shown by the NEEP study. In fact, given the MEEIA plan is analyzing 2016-2018, this CFL cost is likely even too high if it were applied to LED expected pricing in that timeframe. Further, CFLs have much longer expected lives than the EISA compliant halogens and are often cheaper. In order to properly screen the measure, the cost from the future stream of avoided incandescent replacement bulbs needs to be included in the base case. This is the same concept as using the incremental cost for market driven measures. In general, CFLs have a negative incremental cost compared to halogen incandescents and should never fail cost-effectiveness screenings (effectively they are a "better than free" efficiency measure). Further, the CFL is given a measure life of 2 years, presumably under the assumption that savings will drop to zero after two years because of EISA. However, the evidence cited above that EISA is taking longer than expected to phase in and that halogen bulbs will form a significant portion of the post-EISA market contradicts this assumption. In 2020, even though the halogen bulbs may be phased out by EISA, this

phase-out can be expected to happen gradually over the course of a few years and should not be applied to the 2016-2018 installations.

Screened properly, the cost-effectiveness of CFLs and all other lighting measures will increase significantly. The table below shows the screening inputs for a 30-watt commercial CFL replacing a halogen incandescent used by Ameren Missouri compared to the suggested inputs in the Illinois TRM which Ameren Illinois uses.

	Cost	Annualized O&M Savings	kWh saved
Missouri	$9.27	0	31
Illinois	$1.6	$3.02	163

As seen, Ameren Missouri uses highly unfavorable screening assumptions compared to Illinois. Under Illinois's more reasonable cost and O&M savings, CFLs have a payback of half a year even without any energy savings, just based on the O&M savings. Further, Illinois' assumptions show more than five times the savings as the Ameren DSMore screening. It is unclear what assumptions are reflected in Ameren's 31 kWh saved assumptions, but Illinois uses reasonable assumptions for commercial applications of 3,198 hours per year, 72-watt halogen baseline, and a waste heat factor of 1.24 to account for the reduced cooling need from the more efficient bulbs. These inputs are on the same order of magnitude as those used in other jurisdictions. Unfortunately, I was not provided the DSMore screening files for the residential programs, but since residential CFLs have the same costs and wattages as those installed by commercial customers (though lower O&M savings and operating hours) it is safe to assume that the residential CFLs had similarly questionable screening inputs.

Q. Are there other inconsistencies in Ameren's screening inputs?

A. Yes. While the screening inputs that Ameren provided do not provide all the detail needed, the information available calls into question the accuracy of Ameren's measure screening. For example, while the 31 kWh savings used in screening a 30-watt CFL replacing an incandescent in a commercial building are, ostensibly, far too low, Ameren's savings estimates of 135 kWh for an LED replacing a CFL seem too high. Although the type and wattage of the CFLs being replaced are unclear, in general the lumens per watts of LEDs are only slightly lower than CFLs. In other words, there are significantly more savings going from an incandescent or halogen incandescent to a CFL than going from a CFL to an LED. Despite not knowing the specifics of the measure, it seems likely that many screening inputs used in developing the MEEIA plan are not accurate, especially for the lighting measures that often do not include significant operation and maintenance benefits.

Q: Please summarize the reasons why you find Ameren's proposed savings targets to be too low?

A. Ameren's primary source for the savings targets is the EnerNOC potential study. However, this study uses very low take rates to underestimate the potential, finding less potential than other studies performed in the Midwest, less potential than many states are already achieving, and less potential than Ameren is currently achieving. This study further reduces potential by looking at a "program potential" scenario that, among other things, inappropriately eliminates all potential from the public sectors that have not legally opted out. The realistically achievable potential program scenario is lower than

the savings achieved by 23 states even in 2011 and about half the net savings that Ameren achieved in 2014 even after its EM&V adjustments. Given that Ameren has only recently begun these programs, one would expect it could ramp up to higher savings levels as it gains more experience. Further, even the maximum achievable potential program scenario EnerNOC estimated is lower than the savings achieved by 17 states in 2011 and only about 70% of the net evaluated savings that Ameren achieved in 2014. By definition, Ameren's cannot have saved more than the true full maximum achievable potential. Further, given MEEIA's express legislative intent to pursue all cost-effective efficiency resources, Ameren's rejection of even this low MAP estimate is inappropriate.

Ameren, however, compounds these underestimates by using inappropriately reduced targets, supposedly based on 2014 EM&V results, which were also included in Ameren's very high 2014 performance numbers; on codes and standards, which were already included in the EnerNOC study; and on lower avoided costs, which only impacted the 12 most marginally cost-effective measures of the 194 evaluated. Further, as shown above, the most significant measure that Ameren claims is no longer cost-effective was incorrectly modeled and, in fact, is highly cost-effective. In summary, Ameren fails to justify the downward adjustments to the EnerNOC values and its past performance shows that it can achieve much higher levels.

Q. Given that you think Ameren's savings targets in the 2016-2018 MEEIA plan are too low, what would be reasonable targets?

A. The minimum savings targets in the MEEIA rules provide a reasonable ramp rate for Ameren's DSM programs. These rules require 0.5% annual savings as a percent of

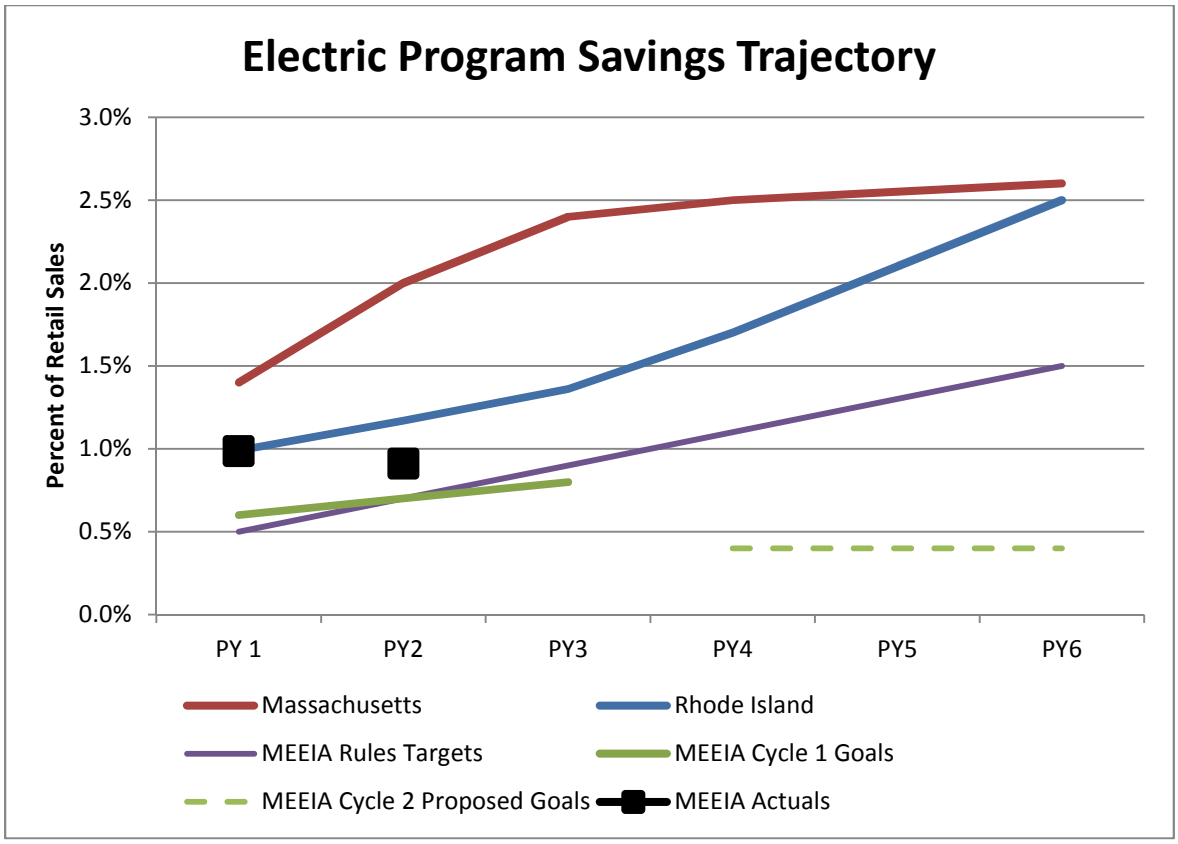
load in 2013, with a ramp up of an additional 0.2% per year until reaching 1.9% savings in 2020. MEEIA rules state that "[t]he commission shall use the greater of the annual realistic achievable energy savings and demand savings as determined through the utility's market potential study or the following incremental annual demand-side savings goals." Since the savings goals in the MEEIA rules are greater than the potential determined through Ameren's market potential study, which I have shown to be unreasonably low, these rules clearly provide that the savings targets should be viewed as a floor and reflect the ramp up rate of 0.2% savings as a percent of load per year.

These savings levels are eminently reasonable and achievable. The graph below shows the ramp-up rates of various programs. The red and blue lines show the planned ramp-up rates of Massachusetts and Rhode Island, respectively, during recent program expansions. These lines begin at the first program year of significant program expansion in each state requiring additional savings beyond an already significant baseline – 2009 for Rhode Island, and 2010 for Massachusetts. Although the line shows the savings targets, and not actual results, both states have generally been able to meet or exceed these goals. In 2014, both states exceeded their target, and Rhode Island, as mentioned earlier, significantly overachieved their goal and captured 3.4% of load.

The purple line in the graph shows the minimum ramp-up rate from 0.5% in 2013 to 1.5% in 2018, as required by the MEEIA rules. As seen, the ramp-up rate embedded in the MEEIA rules is similar to the ramp-up rate already achieved by these two States. Given that Massachusetts and Rhode Island were beginning from much higher baselines, in theory this ramp-up should be much easier for Ameren to accomplish.

As further evidence that the ramp-up prescribed in the MEEIA rules is achievable, the black dots show the actual performance of Ameren Missouri in 2013 and 2014. As seen, the Company achieved significantly more savings than the MEEIA rules in these two years, and there is no reason that Ameren cannot continue ramping up its programs in accordance with the rules.

By contrast, the green line shows the actual MEEIA goals the commission adopted for Ameren's first MEEIA plan (solid green) and Ameren's proposed goals in this plan (dotted line). As is illustrated by the solid green line, in program years 2013-2015, Ameren's cumulative MEEIA goals roughly complied with the minimum targets set forth by the rules. However, in program year 4, or 2016, instead of continuing to increase program activity, Ameren proposes to significantly decrease the savings. The dotted green line starting in PY 04 shows this downward adjustment. The decrease in savings is a major departure from the first MEEIA plan as well as the intent of the MEEIA rules, and as argued earlier, the reasons that Ameren gives for this departure are highly unconvincing. Ameren should be required to continue to hit the readily achievable and reasonable targets set forth in the MEEIA rules.



Specific Program Improvements

Q. Now that you've established that Ameren's 2016-2018 savings targets are significantly lower than the available potential, do you have any specific recommendations on how Ameren can modify its efficiency portfolio to achieve the potential?

A: Yes, there are many ways Ameren can modify its efficiency portfolio to capture deeper energy savings. It is Ameren's responsibility to fully explore best practices and design and propose leading programs, and I do not attempt to exhaustively critique all aspects of their programs nor list all things that could be improved upon. That said, I briefly discuss some examples of program opportunities which include, but are not

limited to: a Small Business Direct Install Program, a New Homes Program, an Energy Analysis Program, cooperation with St. Louis' 25 by 20 initiative, an expanded low-income program, combined heat and power, LED streetlighting, upstream initiatives, key account managers for large C&I customers and residential behavioral programs.

Q. How would a small business direct install program generate additional savings?

The MEEIA plan states that a direct install program is under preliminary consideration, but Ameren declined to include one in its MEEIA Plan.[21] Small businesses have unique and strong market barriers to efficiency, and well-designed SBDI programs are necessary to achieve significant participation in this important customer segment. This particular customer segment has proven very difficult to reach by traditional efficiency programs, but experience in many jurisdictions has proven that small business direct install programs are highly successful at achieving significant savings and program penetration. In fact, the evidence indicates that existing small business direct install programs regularly achieve participation rates of up to 80% - significantly higher than the take rates assumed in the EnerNOC potential study.[22] Therefore, without a small business direct install program, Ameren is leaving significant efficiency potential on the table. We note that KCP&L has included this type of program in its draft 2015 IRP.

Ameren gives more detail in its 2014 IRP,[23] where it states that it is investigating a Small Business Direct Install (SBDI) Program, but that it is not currently planned for implementation due, in part, to cost effectiveness concerns. However, many SBDI

[21] Ameren MEEIA page 12
[22] See, for example: Mosenthal, P. & Wickenden, M., The Link Between Program Participation and Financial Incentives in the Small Commercial Retrofit Market, Proceedings of the International Energy Program Evaluation Conference, 1999.
[23] Ameren 2015 IRP. Page 98.

programs focus largely on lighting, which typically have high cost-effectiveness, despite recent regulations that lower savings for certain linear fluorescent measures. Cost-effective SBDI programs are being run all over the country, including by Ameren in Illinois, where the program was oversubscribed in program year 7 with 29 GWh of savings.[24] Furthermore, SBDI programs can be contracted out to turnkey implementation vendors who already have experience implementing SBDI programs and are thus easy to launch and manage. It is likely that the program fails the cost-effectiveness test largely due to errors discussed earlier in the way lighting measures have been screened.

Q. How would a New Homes and an Energy Analysis Program generate additional savings?

A: The 2013 evaluations found that the residential new construction and home energy analysis programs fail the cost effectiveness test. However, these are important programs making long-lasting upgrades, and will create important lost opportunities if not in place. Further, evaluations appear to have counted costs associated with natural gas measures, but only included electric benefits. The home energy analysis program, for example, provides direct-install energy efficiency measures at no cost to participants and offers rebates for other measures. The PY14 portfolio summary report states that the intent of the home energy analysis is to make "improvements to the following: weatherization, lighting, HVAC, and water heating appliances fueled by natural gas." It also states that all single-family homes receiving both electricity and natural gas from Ameren are eligible to participate. This measure list clearly indicates that the program is

[24] Ameren Illinois Program webpage. http://www.actonenergy.com/for-my-business/explore-incentives/small-business-program

aimed at saving natural gas in addition to electricity. However, when the evaluation report examines the benefits in detail, it only includes avoided electric production, avoided electric capacity, and avoided electric T&D. As such, there may be a mismatch in the program's costs and benefits - the costs may include those for natural gas savings whereas the benefits only include electric benefits. If this is the case, the TRC should be expanded to include the total resource benefits of all the measures and not just the electric benefits or, alternatively, that portion of the program and participant costs should be removed. This approach might allow the program to continue to expand and generate significant savings for Ameren customers. We encourage Ameren to use this as an opportunity to partner with Missouri's gas utilities to run integrated programs or find other ways to make the program cost effective as opposed to simply eliminating it. For example, if gas benefits are not allowed to continue, the program's eligibility requirements could be altered to only include customers with heat pumps or electric resistance heat. Also, the program evaluation found that only 1.1% of audits led to an air-sealing job. This is typically a common and cost-effective measure in this type of program, and increasing air-sealing participation will serve to increase program wide participation. Increasing air-sealing participation by, for example, including a blower door test in every audit would boost program savings and cost-effectiveness. Likewise, the evaluation found large savings for ceiling insulation, but only a 14% participation rate. In general, instead of dismissing the programs out of hand after the evaluation results, Ameren should look for improvements that will allow the programs to continue in a cost-effective manner.

Q. How would an expanded low-income program generate additional savings?

Ameren can significantly expand its low-income program. In the first MEEIA cycle Ameren decided to put greater emphasis on multifamily low income efficiency because there was a large amount of Federal stimulus funds (ARRA) available addressing the single family market. However, by 2016, the ARRA money will be extinguished, giving Ameren an opportunity to expand the low-income program's focus on single-family buildings. While I support Ameren's plan to ramp up focus on single-family low income opportunities, this does not relieve Ameren of the goal of pursuing all cost-effective efficiency in the multifamily low income market as well. Clearly, this is simply another reason that Ameren can indeed continue to ramp up savings even more. More evidence for the potential for additional low-income assessments comes from Ameren's preliminary market assessment, which determined that there are 29,000 potential low-income multifamily units in buildings with 3 or more units. However, this appears to be a significant underestimate. An estimate using census data put together by NRDC and the National Housing Trust determined that the Ameren Missouri service territory has more than 90,000 affordable units in buildings with 5 or more units.[25]

The NRDC report further estimates the total low-income maximum achievable potential for the next 20-years for Ameren Missouri to be 147 GWh.[26] By contrast, the Ameren MEEIA plan calls for an average annual savings of 3.5 GWh. If this level is maintained for 20 years, even if all measures installed lasted more than 20 years, Ameren will still save only 70 GWh, or less than 50% of the achievable potential found by NRDC.

[25] NRDC. Potential for Energy Savings in Affordable Multifamily Housing. March 19, 2015. Table C1. Page 67.
[26] NRDC. Potential for Energy Savings in Affordable Multifamily Housing. March 19, 2015. Table 14. Page 21.

Q. Could combined heat and power generate additional savings for Ameren?

A: Yes. The Company does not include any combined heat and power (CHP) in its MEEIA plan for 2016-2018, nor is it included in the MAP or RAP scenarios in the potential study. Other jurisdictions have seen significant success promoting CHP as part of their efficiency programs. The US currently generates over 12% of its electricity from CHP installations, and several European countries get over 20% of their electric needs from CHP. CHP projects are often very large, and just a couple of large installations in the 2016-2018 time period could increase the MEEIA planned savings dramatically. Further, due to the large average size, CHP programs can often capture savings at a very low program cost. For example, NStar in Massachusetts achieved 10% of its total portfolio savings, or 0.24% of total load at a cost of $0.13 per first-year annual kWh saved. Note that if Ameren had a proportionately similarly sized CHP project as NStar that single project would provide more than 50% of Ameren's proposed MEEIA annual goals. Further, PECO in Pennsylvania achieved 22% of its portfolio savings, or 0.16% of load from CHP projects at $0.09 per kWh.[27] This is significantly lower than the $0.32 per kWh average cost from the 2016-2018 MEEIA plan, and so CHP can add significant savings to MEEIA with a reduction in the average cost.

Q: How could Ameren's efficiency programs impact St. Louis' 25 by 20 initiative?

As of the end of January, more than three dozen large commercial buildings in St. Louis have signed on to a "25 by 20" pledge, which promises to cut electricity

[27] http://www.puc.state.pa.us/General/publications_reports/pdf/EPO_2013.pdf

consumption by 25% by the year 2020.[28] This campaign offers Ameren a significant opportunity to piggy-back off the momentum and publicity associated with the initiative to both help building owners who have joined the pledge actually achieve the ambitious targets and significantly increase the number of building owners taking the pledge. As part of the pledge, some engineering firms have already offered significant discounts for energy audits and benchmarking studies. Ameren could work with these firms to further decrease the cost of audits. Ameren could also work with the building owners taking the pledge to develop an energy plan for how to reach the targets through traditional incentives and other program services for specific capital projects. Public initiatives such as these give efficiency program administrators opportunity to achieve additional penetration while enthusiasm is high and capture deeper than normal savings. Lastly, since this is a new initiative, savings in the commercial and industrial sector in 2016-2018 should be larger than the savings available in 2014 when the initiative had not yet started nor been considered by EnerNOC in its potential study.

Q: How could an LED streetlighting generate additional savings for Ameren?

In section 8.13.4 of its IRP, Ameren states that there is savings potential available from LED streetlighting. However, this potential is not included in the RAP or MAP scenarios, since the streetlights are primarily utility-owned and Ameren is concerned about a potential lag in cost recovery. However, the fact remains that this represents additional cost-effective potential that should have been included in the potential study. More important, the MEEIA plan is the place for Ameren to develop and propose

[28] http://www.stltoday.com/business/local/efficiency-campaign-aims-to-cut-building-energy-use-by-percent/article_13f7eb86-03da-5700-b089-62f8a062d2c8.html

creative mechanisms to overcome any regulatory lag or other perceived disincentives. There are successful models elsewhere, such as Vermont, where efficiency programs have successfully addressed utility-owned streetlights in ways that solved any stranded asset concerns of the utilities and ensured it was in the utilities best interests to move forward and pursue the most cost-effective streetlighting solutions.

Q: How could upstream initiatives generate additional savings for Ameren?

A: As part of its obligations under MEEIA, Ameren should be creatively considering all best practices for efficiency programs and developing a Plan that maximizes the capture of all cost-effective efficiency. Unfortunately, it appears Ameren has primarily focused on simply continuing its current programs, at a lower level of savings than they have previously achieved, and without the programs they claim are no longer cost-effective. However, there is little evidence that Ameren fully considered all the best practices around the country or analyzed how to improve programs and adopt new strategies that could improve cost-effectiveness and increase savings. Just one example of the kinds of best practices Ameren failed to evaluate or propose is the pursuit of upstream efforts that might include more direct "participation" by upstream actors as well as incentives to these actors. While Ameren does have an upstream program for CFLs and certain LEDs, it could be expanded significantly to include more lighting as well as other types of measures such as HVAC and consumer electronics.

Upstream programs involve working directly with manufacturers and distributors to promote high efficiency equipment, including giving incentives to the manufacturers and distributors rather than the end users. In this way, customers do not need to do any

proactive activity to participate in the program – they just see the discounted products on the store shelves and may not even realize that they have just participated in an efficiency program. Further, since retail markups are usually based on a percentage of wholesale prices, by lowering the wholesale price of the product upstream incentives can use less program costs to make the same difference in retail prices. In addition, these upstream market actors are best situated to promote high efficiency products to their customers and are necessarily involved at the appropriate time for time-dependent installations such as replacement-on-failure. Recent efforts in Massachusetts, California and New Brunswick moving standard rebates for lighting and HVAC measures completely upstream where distributors are provided an incentive based on wholesale incremental costs for each unit they sell have been very successful. For example, my testimony earlier shows how a southern California HVAC program's participation increased by an order of magnitude during years when the incentives were moved upstream. Further, in Massachusetts after only a few months of an upstream lighting program, administrators captured far more savings for the upstream products (high performance T8 and LED lamps) than they were capturing with downstream rebates at a lower utility cost. In addition, experience has shown that once manufacturers and distributors agree to participate, these programs have a dramatic effect in terms of transforming markets quickly. This is because they can sell the high efficiency products at the same customer cost as lower efficiency products, thereby only stocking and promoting high efficiency equipment. By not taking into account various program design ideas, such as upstream programs, to increase take rates, EnerNOC is significantly underestimating the true potential.

Q: How could improvements in the C&I custom program generate additional savings for Ameren?

In my experience working in many jurisdictions, successful commercial custom programs with high customer participation include important enhancements and complementary services focused on providing greater customer service and "handholding" as well as detailed technical assistance. These strategies seem to be missing from Ameren's program descriptions. For example, the program plan in Appendix A of the MEEIA application indicates a primarily reactive approach where Ameren will simply make available a rebate application and wait for customers to submit them for review. Without more aggressive, proactive efforts to engage with customers initially and help them identify and develop these projects, experience indicates participation will likely reflect a high level of free ridership and lower than possible participation levels. These additional services include:

- Active account management for medium and large customers (e.g., customers with demand of 200kW and/or 500 MWh annually or more). This includes proactive, customer specific energy efficiency planning and continuous energy improvement strategies designed to reduce the customer's energy use intensity and provide a single point of engagement with the utility to facilitate customer identification, assess opportunities, and coordinate the process of moving forward with implementation. Account managers would also play a major role in engaging with customers as a marketing strategy. Experience indicates that personal, one-to-one marketing in the medium/large commercial and industrial sector is the most effective way to drive participation.

- At the customer's request, the provisions of tiered energy services starting with on-premise walk-thru energy audits (tier I) at no/low cost to the customer.
- Provision of detailed technical assistance and feasibility studies (tier II). Many utilities offer these services initially with a customer contribution of 50% of the cost. If the customer follows through with implementation the 50% is waived and the program covers 100% of the study. This strategy has been quite effective. By requiring an initial commitment of half the cost if the customer does not follow through, it weeds out those customers that are not really serious about making efficiency investments, while at the same time creates a strong incentive for customers to pursue the measures once they are analyzed.
- Turnkey project management services that include energy efficiency project identification, scoping and documentation services such as assisting in filling out program materials, engaging with design professionals and contractors, and generally helping to coordinate the participation and implementation process.
- Maintaining a group of expert process engineers in various industrial processes. These can be referred to industrial clients to examine their industrial process energy usage for efficiency improvements. There are often many low/no cost process measures that can significantly reduce process related energy expenditures.

The St. Louis 25 by 20 initiative mentioned earlier offers another significant opportunity to initiate many of these strategies, since there are a number of large building owners signing up. Ameren could sign a Memoranda of Understanding with the participants in the initiative, in which Ameren agrees to help with commissioning, audits, the development of a strategic energy management plan, and incentives for capital projects in exchange for the significant commitment of the building owners to reduce

energy usage by 25%. These MOUs will secure significant savings for the utility and help build relationships with important customers.

Q: How could improvements in the business new construction program generate additional savings for Ameren?

A: The business new construction program could make changes similar to those suggested for the custom program. As described in Appendix B, the program will provide "materials" via direct mail and training to "trade ally sales staff."[29] But, the main activity of the program is to review applications and provide assistance completing applications "as they are received."[30] This program does not seek to proactively address this important lost opportunity market. The described activities fall well short of best practices. To effectively address the commercial new construction market, it is critical for the program to engage with design professionals and customers at the beginning of the design process to steer them toward comprehensive efficiency solutions. A mostly reactive approach will likely miss these opportunities and be relegated to being able to only influence a few incremental pieces of equipment because the building design will already be fairly fixed. These types of measures are likely to come through the Standard Program and miss the large opportunities in new construction. I recommend the following refinements:

- Employ strategies for aggressive outreach, training and engagement with architects, engineers, design-build firms and lighting designers.

[29] MEEIA Plan Appendix A, page 2
[30] MEEIA Plan Appendix A, page 1

- Intervene at the very beginning of the design phase with customers and design professionals rather than simply reacting to requests for incentives after design decisions have been made.
- Provide comprehensive technical assistance focused on whole building design and operation. As with the Custom Program, a good model would be to initially cover 50% of this cost, with the other 50% covered if the customer follows through with implementation.
- Support and advance energy codes in the State, and train officials and trade allies in energy code compliance.
- Consider offering design incentives to the design professionals to undertake efficiency technical assistance work. Often, these professionals can be a barrier to projects because analyzing additional high efficiency options, comparing them with baseline code practices, running models, etc. creates additional costs for the architects and engineers.
- Aggressive monitoring of all future construction activity through things such as Dodge reports, new service requests, and other available information to identify customers and design professionals at the earliest stage, combined with personal contact marketing to the key players to encourage early and comprehensive engagement.

Q: How could a residential behavioral program generate additional savings for Ameren?

Ameren could achieve significant additional savings through a behavioral program for the residential sector. There are many different iterations of behavioral programs, but they typically take the form of a home energy report that examines the home's energy usage pattern, compares it to typical usage, and provides suggestions on ways to further save energy. The home energy report is often combined with a web portal that the customer can access from anywhere. There is an increasing body of research

indicating that behavioral programs can achieve large amounts of savings. For example, a 2012 evaluation of Massachusetts's behavioral programs found that opt-out programs saved between 1.32% and 2.02% of total electricity per household per year, depending on the specifics of the program. An opt-in program saved 5.7% of usage per household, but significantly lower participation meant that total savings actually dropped. I encourage Ameren to explore adding a residential behavioral program to its efficiency portfolio.

Demand-Side Incentive Mechanism (DSIM)

Q. Do you have any concerns with the proposed changes to the DSIM?

A. Yes. In the 2016-2018 MEEIA plan, Ameren proposes that the savings goals used to calculate the performance incentive self-adjust based on:

- Changes in the savings due to TRM updates and EM&V results
- Programs that are added or removed in the middle of the cycle
- Modifications in program design
- Unforeseen changes in DSM program cost-effectiveness modeling inputs

This proposal is highly problematic and inoculates Ameren from a great deal of performance and evaluation risk inappropriately. For example, if a program is underperforming, Ameren can simply propose to eliminate the program, have the goals adjusted downwards, and still receive the full performance incentive without replacing those lost savings. Further, if EM&V results indicate reduced savings from some measures the appropriate response should not be to simply adjust the performance goals. Rather, Ameren should explore changing the program design to adjust for this, potentially

including adding new measures, modifying eligibility criteria, or other strategies. If EM&V results indicate that a program is not cost-effective, Ameren should closely examine the program design and look at nationwide best practices in order to improve the program. Effectively, the EM&V is evaluating *Ameren's performance*, and a low result does not mean the savings goals are impossible. Rather, a low result means that Ameren has not met expectations and needs to make some mid-course corrections to improve programs. Ameren is asking to eliminate virtually all evaluation and performance risk, which is inappropriate under a relatively generous performance shareholder incentive approach.

Q. Do you have any issues with the current structure of the DSIM?

A. The most concerning aspect of the proposed DSIM structure is that it does not true-up the throughput incentive net shared benefit award based on evaluated data. The purpose of the throughput incentive is to compensate the utility for lost marginal revenue due to the efficiency activities. Without any true-up based on EM&V, then Ameren may over collect. As a result, ratepayers would pay Ameren more in the throughput incentive than it actually lost in revenue. We have seen this occurr in 2013 and 2014, where EM&V results indicated downward adjustments to initial savings estimates.

Q. Are there any revenue models that could be used to avoid these issues with the throughput disincentive?

A. Yes, I believe that a decoupling approach would be preferable to the currently proposed DSIM approach. A decoupling approach would eliminate the throughput

disincentive while avoiding issues regarding how to best calculate and true-up lost revenues from energy efficiency. Under a decoupling scenario, Ameren would be ensured fair revenue after taking into account all factors that effect loads, not just for efficiency. This would ensure that Ameren does not over collect on its throughput disincentive. NRDC witness Ashok Gupta further addresses this issue in his direct testimony.

Q. Do you have any other concerns about the proposed DSIM approach?

A. Yes. Ameren is proposing a relatively generous cost recovery scheme, whereby it would be made whole on all spending, the assumed lost marginal revenue, plus a performance incentive that can provide additional earnings to shareholders. I support the concept of removing disincentives and providing positive incentives to investor owned utilities to encourage them to strive for exemplary performance and to balance risk. However, under Ameren's proposal, I believe these levels of reward are unjustified because Ameren is effectively removing most of the risk and is proposing savings levels that are not challenging or anywhere close to those one could perceive as exemplary performance. I could support such as scheme, but only if the goals were set at much higher levels.

Q. What do you recommend the Commission do?

A. The Commission should find that Ameren's proposed MEEIA goals are a dramatic underestimate of cost-effective savings potential. Consistent with the MEEIA rules, Ameren should be held to, at least, the "minimum targets." These are 1.1%, 1.3%, and 1.5% of load in 2016-2018, respectively. As illustrated in the graph above, these

targets are simply an extension of what Ameren agreed to in the current MEEIA Cycle 1 Plan. Further, the MEEIA rules are clear that these should be considered minimums.

Second, I recommend the Commission reject Ameren's proposal to adjust goals going forward based on new EM&V or other changes. Finally, I encourage the Commission to adopt a decoupling scheme and eliminate the need for the throughput disincentive net shared benefit scheme.

Q. Does this conclude your testimony?

A. Yes, thank you.