RESPONSE TO CHANGE REQUESTS

OF

GEOFF MARKE

UNION ELECTRIC COMPANY

d/b/a Ameren Missouri

CASE NO. EO-2012-0142

APPENDIX A

** **

Denotes Proprietary Information that has been Redacted

October 6, 2014

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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 Filing to Implement Regulatory Changes in Furtherance of Energy Efficiency as Allowed by MEEIA.	))))	**Case No. EO-2012-0142**

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Geoff Marke, of lawful age and being first duly sworn, deposes and states:

1. My name is Geoff Marke. I am a Regulatory Economist for the Office of the Public Counsel.

2. Attached hereto and made a part hereof for all purposes is my testimony in response to change request.

3. I hereby swear and affirm that my statements contained in the attached affidavit are true and correct to the best of my knowledge and belief.

Geoff Marke

Geoff Marke

Subscribed and sworn to me this 6th day of October 2014.

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

JERENE A. BUCKMAN
My Commission Expires
August 23, 2017
Cole County
Commission #13754037

Jerene A. Buckman

Jerene A. Buckman
Notary Public

My commission expires August 23, 2017.

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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title and business address.

A. Dr. Geoffrey Marke, Economist, Office of the Public Counsel (OPC or Public Counsel), P.O. Box 2230, Jefferson City, Missouri 65102.

Q. Please describe your education and employment background.

A. I received a Bachelor of Arts Degree in English from The Citadel, a Masters of Arts Degree in English from The University of Missouri, St. Louis, and a Doctorate of Philosophy in Public Policy Analysis from Saint Louis University (SLU). At SLU, I served as a graduate assistant where I taught undergraduate and graduate course work in urban policy and public finance. I also conducted mixed-method research in transportation policy, economic development and emergency management.

I have been in my present position with OPC since April of 2014 where I have been responsible for economic analysis and policy research in electric and gas utility operations. Prior to joining OPC, I was employed by the Missouri Public Service Commission as a Utility Policy Analyst II in the Energy Resource Analysis Section, Energy Unit, Utility Operations Department, Regulatory Review Division. My primary duties in that role involved reviewing, analyzing and writing recommendations concerning electric integrated resource planning, renewable energy standards, and demand-side management programs for all of the investor-owned electric utilities in Missouri. I have also been employed by the

Missouri Department of Natural Resources (later transferred to the Department of Economic Development), Energy Division where I served as a Planner III and functioned as the lead policy analyst on electric cases. I have worked in the private sector, most notably serving as the Lead Researcher for Funston Advisory based out of Detroit, Michigan. My experience with Funston involved a variety of specialized consulting engagements with both private and public entities; additionally, I have provided analysis on independent compliance audits.

Q. Have you testified previously before the Missouri Public Service Commission?

A. Yes, prior to this case I submitted written testimony in EO-2014-0189, GR-2014-0086 and GR-2014-0152.

Q. Have you been a member of, or participate in, any work groups, committees, or other groups that have addressed electric utility regulation and policy issues?

A. Yes. I am currently a member of the National Association of State Consumer Advocates (NASUCA) Distributed Energy Resources Committee which shares information and establishes policies regarding energy efficiency, renewable generation, and distributed generation, and considers best practices for the development of cost-effective programs that promote fairness and value for all consumers. I am also a member of NASUCA's Electricity Committee that discusses current issues affecting residential electric consumers. Additionally, I have been an active participant in all of the approved Missouri investor-owned electric utility (IOU) energy efficiency programs.

II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please outline the recent events leading up to this filing.

A. In 2012, Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri") and the parties to this case submitted to the Commission for approval a Unanimous Stipulation and

Agreement ("Stipulation") related to the Company's implementation of MEEIA.[1] The Commission issued an order approving the Stipulation on August 1, 2012 and as amended on December 19, 2012. The Stipulation contained provisions related to the evaluation, measurement and verification ("EM&V") of energy efficiency measures undertaken by Ameren Missouri, including procedures whereby a party may request changes to the Final EM&V Report for each year. Further, the Stipulation requires Ameren Missouri to complete Evaluation, Measurement and Verification Reports ("EM&V Report") on its MEEIA Programs and file final EM&V Reports after the end of each MEEIA Program year.[2] In pertinent part, the report provides as follows:

> Any stakeholder group participant who wants a change to the impact evaluation portion of a Final EM&V Report will have 21 days from the issuance of the Final EM&V Report to file a request with the Commission to make such a change ("Change Request"). Any stakeholder group participant filing a Change Request will set forth all reasons and provide support for the requested change in its initial Change Request filing. Responses to a Change Request may be filed by any stakeholder group participant and are due 21 days after the Change Request is filed. The response should set forth all reasons and provide support for opposing or agreeing with the Change Request. Within two business days after the deadline for filing a Change Request (if a Change Request is filed), the Signatories agree that the stakeholder group participants will hold a conference call/meeting to agree upon a proposed procedural schedule that results in any evidentiary hearing that is necessary to resolve the Change Request to be completed within 60 days of the filing of the Change Request, and which will recommend to the Commission that the Commission issue its Report and Order resolving the

[1] MEEIA is the Missouri Energy Efficiency Investment Act of 2009, § 393.1075, RSMo. The Commission MEEIA Rules include 4 CSR 240-3.163, 4 CSR 240-3.164, 4 CSR 240-20.093 and 4 CSR 240-20.094.

[2] File No. EO-2012-0142, Unanimous Stipulation And Agreement Resolving Ameren Missouri's MEEIA Filing , pp. 15-19.

> Change Request within 30 days after the conclusion of such a hearing. The Signatories anticipate a hearing with live testimony may be required to resolve a Change Request, but if a hearing is not required, they agree to cooperate in good faith to obtain Commission resolution of a Change Request as soon as possible. The Signatories will be parties to a Change Request resolution proceeding without the necessity of applying to intervene. The procedural schedule for such a Change Request proceeding will provide that data request objections must be lodged within 7 days and responses will be due within 10 days (notifications that additional time is required to respond will also be due within 7 days) (Stipulation, p. 16-17).

Ameren Missouri hired The Cadmus Group, Inc. ("Cadmus") to prepare an EM&V Report for each of its residential MEEIA Programs, and ADM Associates, Inc., ("ADM") to prepare an EM&V Report for its commercial and industrial MEEIA Programs. Ameren Missouri has now completed the first year of energy efficiency measures, and the third party evaluators, Cadmus and ADM, have completed EM&V activities culminating in the filing of the Reports as revised on June 12, 2014 (Collectively referred to as "EM&V Reports" or "Reports").

In accordance with Commission Rule 4 CSR 240-20.093(7), the Commission issued a Request For Proposals and subsequently hired Johnson Consulting Group, LLC, ("Johnson Consulting" or "Auditor"), as its "…independent contractor to audit and report on the work of each utility's independent EM&V contractor." On July 2, 2014, the Commission's Auditor filed its EM&V Auditor Final Report and Appendix A: Auditor Market Effects Sales Analysis. Johnson Consulting Group later filed its updated third Final EM&V Auditor Report and Supporting Documentation on August 27, 2014.

Accurate EM&V results are important because all Signatories to the Stipulation are bound by the impact evaluation portion of the final EM&V Reports, as they may be modified by the Commission's resolution of any Change Request. The accuracy of the impact evaluation in each final EM&V Report is significant because it determines the level of performance incentive Ameren Missouri will receive for its implementation of each MEEIA Program. Ameren Missouri will begin to bill its customers for the awarded incentive amounts following the three year cycle of MEEIA Programs.

The Stipulation also requires any stakeholder group that wants a change to the impact evaluation portion of a final EM&V Report to file a request before the Commission within 21 days of the filing of a final EM&V Report in this matter.

On July 3, 2014, the Staff filed *Staff's Change Request For Adjustment To Ameren Missouri's Report of 2013 Annual Energy Savings And Net Benefits From MEEIA Programs*. Also on July 3, 2014, Ameren Missouri filed an *Application For Approval of Change Request* seeking to make certain changes to the EM&V reports that were filed by the Company's third party evaluators, Cadmus and ADM.

On July 7, 2014, the Staff of the Missouri Public Service Commission ("Staff"), Public Counsel, and the Missouri Department of Economic Development-Division of Energy ("Division of Energy") filed the *Joint Proposed Procedural Schedule For Change Request.*

On July 17, 2014, the Commission issued its *Order Establishing Procedural Schedule to Consider Change Requests* to set the matter of the program year 2013 change requests for Commission determination.

Then, on July 30, 2014, Ameren Missouri joined Staff, Public Counsel, and the Division of Energy in the *Motion to Modify Procedural Schedule.* On the motion of Ameren Missouri and Staff, the Commission issued its *Order Staying Procedural Schedule* on August 20, 2014, to allow the parties additional time to conduct settlement discussions.

On September 19, 2014, Ameren Missouri and Staff filed a *Non-Unanimous Stipulation and Agreement Settling the Program Year 2013 Change Requests*. Public Counsel objected and requested an evidentiary hearing.

In compliance with the Commission's *Order Directing The Parties To File A Proposed Procedural Schedule*, Public Counsel proposed the same procedural schedule that had been agreed to by the parties and ordered by the Commission on two occasions. Ameren Missouri and Staff would not agree to adopt the same procedural schedule and filed a competing procedural schedule on October 1, 2014.

On October 3, 2014, the Commission issued its *Order Establishing Partial Procedural Schedule to Consider Change Requests*. That procedural schedule established a date for stakeholder response to any change request filed.

It is pursuant to that Order and the 2012 Stipulation that the Office of Public Counsel now offers these comments in response to the change requests for the purpose of determining the 2013 incremental annual energy and demand savings and net benefits calculation for Ameren Missouri's MEEIA programs.

Q. Please provide a brief glossary of commonly used terms with a working example.

There are several terms that are utilized throughout this testimony that are related to the EM&V of energy efficiency programs. For purposes of this testimony I will use the following terms and concepts including:

<u>The Net-to-Gross (NTG) ratio:</u>

This is a ratio used to determine the actual energy savings attributable to a particular program, as distinct from energy savings that would occur naturally (in the absence of the program).

- The gross estimate amount is represented as 1.0. The net amount can be higher or lower
- A net-to-gross above 1.0 suggests that the program produced additional benefits beyond the savings from the actual rebated measure.

- A net-to-gross below 1.0 suggests that the program overstated the benefits associated with the savings from the actual rebated measure.

<u>Free Rider (or free ridership):</u>

This term describes a customer who would have taken the recommended action on their own, even if a program did not exist.

- Free ridership estimates lower the net-to-gross ratio (1.0 – free ridership).
- Cadmus/ADM and the Auditor agree on the free ridership estimates.
- Ameren believes these estimates are overstated.

<u>Spillover:</u>

This term describes that some customers will be influenced by a program and will take a recommended action, but will never claim an incentive.

- Spillover estimates raise the net-to-gross ratio (1.0 + spillover).
- The Cadmus (residential program) evaluation broke spillover into subsets, non-participant spillover and participant spillover.
- The ADM (business program) evaluation only utilized participant spillover.
- Cadmus/ADM and the Auditor disagree on the spillover estimates, but the differences between the two are not pronounced.

<u>Participant spillover example</u>: An Ameren Missouri ratepayer buys an Ameren Missouri rebated CFL, becomes more energy efficiency conscious as a result of the purchase and then decides to buy an energy efficient TV (that is not rebated by Ameren).

<u>Non-participant spillover example</u>: An Ameren Missouri ratepayer sees an Ameren Missouri energy efficiency commercial on TV and as a result of that commercial decides to buy an energy efficient TV (that is not rebated by Ameren Missouri).

Market Effects:

This describes a change in the structure of a market that is casually related to the utility's programs.

- Market effects estimates raise the net-to-gross ratio (1.0 + market effects).
- The Cadmus (residential program) evaluation factored in market effects for one program—LightSavers.
- The ADM (business program) did not utilize market effects.
- The Auditor included two final estimates in their evaluation:
  - One with a different calculation for market effects in the LightSavers program.
  - One without any factor for market effects in the LightSavers program.
- OPC and Staff (in their initial change request) reject the use of market effects in both Cadmus and the Auditor's version.

Upstream Lighting Program

A program designed to provide instant rebates on lighting at the point of purchase. Utilities work with retailers and distributors to "buy down" the original cost of an efficient light bulb. Light bulbs are then placed on store shelves at a reduced price to entice energy efficient sales.

- A customer goes into a Lowe's and buys a $3.00 CFL for $1.00. The price has been subsidized prior to this purchase by Ameren Missouri ratepayers.

<u>The Net-to-Gross Ratios Being Used:</u>

Basic formula:	NTG = 1.0 - free ridership + spillover
Cadmus:	NTG = 1.0 - free ridership + participant + nonparticipant
Cadmus (LightSavers):	NTG = 1.0 - free ridership + participant + nonparticipant + market effects
ADM:	NTG = 1.0 - free ridership + participant

- The calculation of net-to-gross is different in many States. States vary considerably over the appropriate factors of net-to-gross with some states only including free ridership and other States not even attempting to calculate net savings.
- Net savings are generally used when a performance incentive is at stake and/or if stakeholders want to know what actually occurred for program design purposes moving forward.
- In Missouri we calculate both gross and net savings. Gross savings for purposes of the lost revenue mechanism and net savings for purposes of the performance incentive.

Q. Please provide an overview of the specific topics you will be discussing including what is agreed on and what is potentially at stake.

A. The OPC and other stakeholders are in general agreement on a number of issues. All parties believe that Ameren Missouri performed well in PY2013. Every estimate of the annual net shared benefits and MWh savings for the program year before the commission in this filing reflects Ameren Missouri outperforming their 2013 target goal, and shows Ameren Missouri is well on its way to achieving the maximum performance incentive available to them.

Ameren Missouri's energy efficiency savings are largely a result of one program—LightSavers, which is mostly a result of one measure—a rebate for the standard compact fluorescent light bulb (CFL).

The number of CFLs that were sold in PY2013 is not being contested. Due to the unanimous stipulation and agreement entered into by parties in 2012, Ameren Missouri will receive the estimated gross savings attributed to each bulb (over 4 million CFLs) through their lost recovery mechanism.

What is contested is the impact and evaluation attributed to not just the CFL but to the LightSavers program (i.e., marketing, trade ally/vendor/customer awareness). This is also known as the estimated net savings by which the utility performance incentive amount is determined.

Ameren Missouri, and their EM&V evaluator Cadmus, argue that through Ameren Missouri's efforts, the LightSavers program transformed the lighting market in their service territory. They argue that the rebated CFL had an overall effect of inducing additional energy efficient actions, and that these actions collectively changed the market for how retail stores and vendors operate their business and how customers approach energy efficiency.

Public Counsel agrees many CFLs were sold. However, a lot of those CFLs would have been purchased regardless of the program. Ameren Missouri and Cadmus are overstating the benefits that they are claiming are a result of these discounted CFLs. My testimony will provide evidence that the market effects Ameren Missouri and Cadmus are claiming are really a result of creative and aggressive evaluations and more accurately attributable to outside forces (federal legislation) and separate actors (naturally occurring market forces).

At the end of the testimony I also address an additional issue—the net shared benefit calculation. This estimate is miscalculated and overstates the net shared benefits because it does not accurately reflect the cost of incentives as addressed in 4 CSR 240-20.093(1)(C).

OPC believes that there are a number of issues at stake as a result of this filing including:

- As much as $1,944,127.00 in excess performance incentives being awarded to Ameren for PY2013.

- A likely similar excess award for PY2014 and PY2015.
- A non-binding, but nonetheless precedent setting case facilitating similar outcomes for ratepayers from other Missouri electric IOUs under Commission approved MEEIA plans.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to address:

- The original change request filed by Ameren Missouri that reduces free ridership estimates.
- The direct testimony of Ameren Missouri employee Rick Voytas filed in support of that change.
- The original change request filed by the Public Service Commission Staff (Staff) that proposes to eliminate market effects.
- The non-unanimous stipulation and agreement entered into by Staff and Ameren Missouri which proposes a "black box" calculation of the energy savings and net shared benefits amount.
- The appropriate method to calculate the net shared benefits under Commission rules 4 CSR 240-20.093(1)(C).

Q. Please summarize your primary recommendations.

A. The OPC recommends that the Commission reject Ameren Missouri's proposed downward adjustment of free ridership scores because they are unreasonable and result in an overestimation of net shared benefits. The Commission should adopt Staff's initial change request that calls for the elimination of market effects in the formula used to calculate the LightSavers net-to-gross ratio. Additionally, the net shared benefits amount has been inaccurately calculated per 4 CSR 240-20.093(1)(C). An accurate and reasonable amount reflecting the utility's performance incentive should be deducted from the calculation of the net shared benefits, as it is ultimately a cost that ratepayers will have to pay.

II. RESPONSE TO AMEREN MISSOURI'S CHANGE REQUEST FOR ADJUSTMENTS IN FREE RIDERSHIP

Q. What is Ameren Missouri's change request asking for?

A. Ameren Missouri argues that the free ridership scores are overstated in the evaluators' (Cadmus for residential and ADM for business) EM&V reports and that the overall portfolio savings should be increased by 5,512,606 kWh. This would result in a total of 395,996,803 kWh (or 395,996 MWh) of energy savings for PY2013.

Q. On what basis does Ameren Missouri support their change request?

A. Ameren Missouri witness, Rick Voytas, argues that estimates of free ridership by both Cadmus and ADM are overstated due to the reliance on standardized self-reporting surveys to estimate net-to-gross ratios. Mr. Voytas contends that self-reporting surveys are subject to bias which has the direct effect of overstating free ridership and, thus, understating the overall impact of Ameren Missouri's MEEIA portfolio. Mr. Voytas proposes a readjustment based on a proprietary market research paper by the market research firm YouGov.

Q. How do you respond?

A. I agree with Mr. Voytas that self-reporting bias is an issue inherent in survey design. However, there is insufficient supporting evidence of self-reporting bias in the evaluators' work to warrant a collective downward adjustment in free ridership scores. Moreover, as I discuss in this testimony, the evaluators' estimates of free ridership are conservative in their final net-to-gross calculation. No additional adjustment to free ridership is necessary.

Q. Please explain.

A. There are a number of reasons why it would be inappropriate to make any downward adjustment to free ridership estimates including:

The Program evaluators' anticipated and addressed self-reporting bias.

As the Company is well aware and has acknowledged in the testimony of Mr. Voytas, the evaluators are recognized industry leaders and fully aware of the threat of self-reporting bias inherent in self-reporting surveys and have taken steps to mitigate this problem. Cadmus, in particular, has written publicly about the need to account for this type of bias in their article, *The Trouble with Freeriders*.[3] In fact, Mr. Voytas praises Cadmus for their knowledge on the subject in his direct testimony, stating:

> Cadmus wrote the most comprehensive, thoughtful, and analytic explanation of the two issues that I have read on the subject. **There should be no question that Cadmus understands beyond a shadow of a doubt the issues underlying the high free ridership bias resulting from the use of customer self-reporting surveys** (p. 11, 9-12) (emphasis added).

This is high praise for an evaluation team (that includes one of the authors of the referenced article) he subsequently criticizes. Cadmus and ADM collectively represent many years of EM&V analysis, were personally selected by Ameren based on their credentials, and are well aware of proper survey designs to mitigate various bias results. It also should be noted that the evaluators relied on additional data points in calculating a program's net-to-gross ratios (e.g., time-of-use studies, on-site inspections, surveys with program administrators and trade allies, etc…).

[3] Haeri, H. & Khawaja S.M. (2012) The Trouble with Freeriders. Public Utilities Fortnightly http://www.cadmusgroup.com/wp-content/uploads/2012/11/Haeri-Khawaja-PUF-TroublewithFreeriders.pdf

Self-reporting by contractors and trade allies also suffers from the potential of self-reporting bias.

Mr. Voytas suggests that instead of focusing on the customers who purchased the rebated product, greater emphasis should be placed on trade allies and contractor feedback. According to Mr. Voytas,

> Contractors or trade allies, who know when sales volumes change meaningfully from year-to-year, saw a definite correlation between increased efficient air conditioner sales and the Ameren MO CoolSavers program and associated customer financial incentives in 2013. This is proof positive that the CoolSavers customer self-reporting surveys yield estimates of free ridership that were biased in the high direction (p. 13, 26 – 30).

The problem with this approach is that trade allies and contractors more so than any group outside the utility itself, risk offering a biased response regarding the impact of rebates on a customers purchasing decision. Why? Because they stand to gain financially from it. Whereas the customer’s answer might vary if the questionnaire is not properly designed, the contractor may be more inclined to positively affirm a program that generates more business. This is not to suggest that trade allies and vendors should not be utilized in the EM&V process. But instead that their collective responses are better utilized in program design, not program impact.

What is perplexing about Mr. Voytas’ assertion is that Cadmus did adjust free ridership scores based on trade ally and vendor responses. In fact, he cites an excerpt from the Cadmus ApplianceSavers Evaluation in his testimony:

> When asked what percentage of their customers decided to replace this year, the contractor typically responded that about one-third to two-thirds replaced their system this year due to the incentive when they otherwise would have

> deferred replacement. As these responses do not agree with the participants' self-reported responses (about 60% claimed they planned to replace this year, even without the incentive), **we adjusted free ridership scores. If a participant claimed an intention to install this year, but also said their contractor had an important influence on the decision to install the new system, we applied a decrement to the free ridership score; so the results would more closely align** (qtd in Voytas p. 13, 9 – 20) (emphasis added).

It is unclear what more Mr. Voytas is asking for in this case. If he believes that the customer surveys should be eliminated entirely in favor of feedback from trade allies and vendors, I disagree. If he is in favor of weighting customer responses downward and trade ally's surveys upward, I disagree to this as well, because it would be inappropriate given the potential for a financial motivation to infect the calculation of the net-to-gross ratio.

The free ridership estimates are already conservative.

There will always be light bulbs that will need to be replaced and energy efficient HVAC's will continue to be sold regardless of whether or not the local utility company gives out a rebate. Some consumers will be more likely to partake in energy efficient upgrades regardless of the cost. Ratepayers should not subsidize actions that would have occurred naturally, let alone reward utilities for these naturally-occurring actions.

Unlike spillover, which has been broken down into three subsets in these evaluations (participant, nonparticipant, and market effects), free ridership classification has not been further refined by the evaluators. A review of the most recent edition of the National Renewable Energy Laboratory (NREL) Uniformed Method Projects[4] does provide descriptions of subsets of free ridership including:

[4] Under the Department of Energy, the Uniformed Methods Project is an attempt to develop a framework and a set of protocols for determining the energy savings from specific energy efficiency measures and programs.

Total free riders: Participants who would have completely replicated the program measure(s) or practices on their own and at the same time in the absence of the program.

Partial free riders: Participants who would have partially replicated the program measure(s) or practice(s) by implementing a lesser quantity or lower efficiency level.

Deferred free riders: Participants who would have completely or partially replicated the program measure(s) or practice(s) at the time after the program timeframe.[5]

What we count and how we classify items matters. The evaluators elected to use the most conservative classification of free ridership. Had *partial* or *deferred* free ridership been counted, the final results would be greater. Of course this did not happen, nor should it in Missouri because this is the sort of differentiating that only leads to a point of diminishing returns for ratepayers. However, it is important to note and account for the fact that the upstream lighting program in particular is subject to a special form of free ridership known as "leakage."

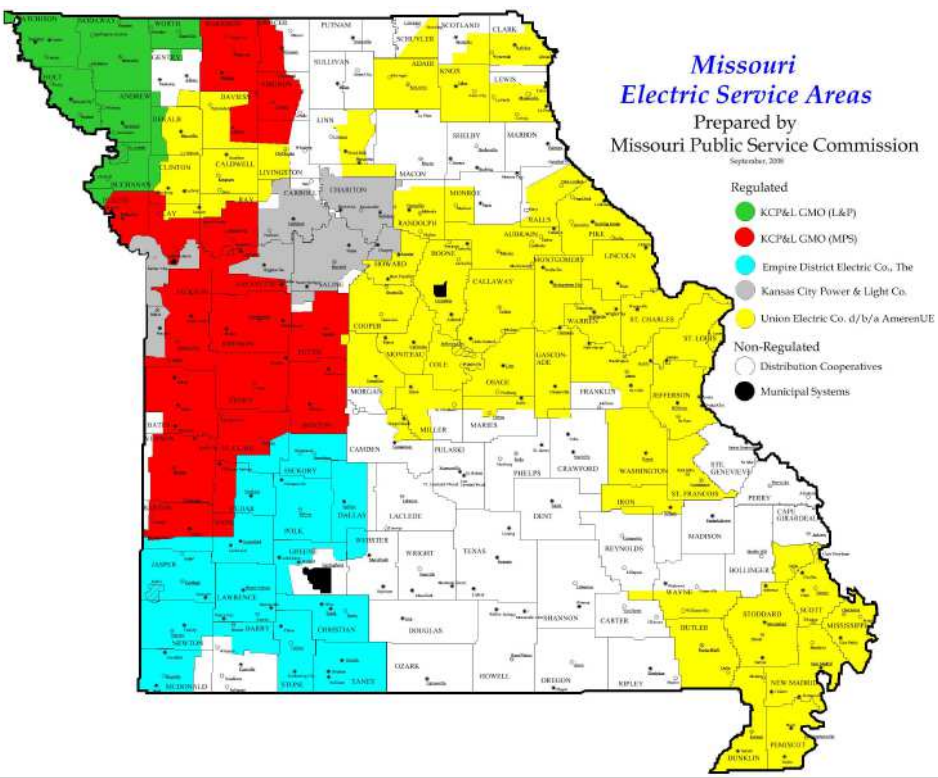
According to the Arkansas Technical Resource Manual:

> Cross-territory sales, or "leakage," occur when program-incented efficient products are installed outside of the funding utility's service territory. When this occurs, the energy and demand savings from the incentivized product are not being realized within the territory that paid for, and is claiming savings for, the unit. Upstream programs are particularly vulnerable to leakage as the rebate recipient is unknown and sales not restricted based on utility.[6]

Leakage Example: A Co-Op utility ratepayer goes into a Wal-Mart and buys an Ameren Missouri rebated CFL. Ameren ratepayers have subsidized the purchase but have not received the direct benefits.

[5] Violette, D. & Rathburn, P. (2014) Chapter 17: Estimating Net Savings: Common Practices. National Renewable Energy Laboratory. http://www.nrel.gov/docs/fy14osti/62678.pdf
[6] APSC Docket 10-100-R-Doc. 110 filed 8/30/2013 http://www.apscservices.info/EEInfo/TRM.pdf

This can be a huge problem. For example, recently Arkansas experienced a contested case where the Southwestern Electric Power Company's (SWEPCO, an Arkansas electric IOU) EM&V leakage results were estimated to account for 55.75% of their overall sales.[7] Leakage can be a significant problem in states where rebates are not uniform across utilities. In Ameren Missouri's case, leakage can present a problem because their service territory borders with multiple co-ops, municipal utilities and other investor-owned utilities that do not participate in a similar program. A look at the Missouri electric utility service area map provided on the Missouri Public Service Commission's website illustrates the vast potential for leakage inherent in Ameren's LightSavers program. Ameren Missouri's service territory represents the yellow sections on the state (or light grey if testimony is not in color).[8]



[7] APSC Docket 07-082-TF: In the matter of the application of Southwestern Electric Power Company's initial energy efficiency program plan and energy efficiency cost rate rider. http://www.apscservices.info/pdf/07/07-082-tf_303_1.pdf

[8] Missouri Public Service Commission (2014) Map of Missouri Electric Service Areas. http://psc.mo.gov/CMSInternetData/Electric/Missouri%20Electric%20Service%20Area%20Map-9-18-08.pdf

The Cadmus evaluation does in fact attempt to account for leakage at the ex-post level by estimating that 3.3% of all upstream markdown bulbs were purchased by non-Ameren customers in 2013. According to Cadmus, leakage rates decreased from 8.7% to 3.3% since the 2010 study. Cadmus attributed this drop in leakage to a change in Ameren's retail partner vendor APT, who only allowed national chain retailers (Wal-Mart, Home Depot, Lowe's) to participate with stores in locations in a zip code with 70% or more of the meters belonging to Ameren. As a result Cadmus came up with the following estimates as seen in Table 1:

<u>Table 1: Cadmus Estimates of "leakage" in Ameren Missouri PY2013</u>

Ameren light bulbs sold to Ameren ratepayers	4,028,717 (96.7%)
Ameren light bulbs sold to non-Ameren ratepayers	137,484 (3.3%)
	4,166,201 total bulbs

Based upon the aforementioned, <u>3.3% is a very conservative leakage estimate.</u> To be sure, other utilities operating with similar patchwork service territories have seen leakage rates at much higher levels, as described above for SWEPCO operating in Arkansas.

Q. Your testimony has primarily centered on Ameren Missouri's response to residential free ridership estimates. Does Ameren provide any response to estimates of free ridership on the business side?

A. Yes. The business evaluation was conducted by a different evaluation team, ADM. Mr. Voytas is critical of ADM's approach in his testimony and suggests that they incorporated a minimalist approach in estimating free ridership. His main concern stems from the fact that they did not attempt to survey the business program trade allies. He also suggests that ADM could have reviewed customer maintenance records to see if there were any patterns of upgrading equipment to more efficient standards.

Q. Would reviewing business records help inform EM&V estimates?

A. More data points are always a good thing, but even reviewing customer maintenance records is not going to give a clear picture of the motivation behind a customer's decision. Additionally, it is unclear how the evaluators would gain access to such information—which would likely be proprietary.

Q. Are you troubled that ADM didn't interview business trade allies?

A. No. I understand why Mr. Voytas would want trade ally feedback to be included in the calculation of free ridership, but as expressed above, all of the potential disadvantages of self-reporting surveys are only exaggerated when the questions are posed to an entity that has a financial stake in the outcome.

Q. Did ADM differ in any other meaningful way from the residential evaluator, Cadmus?

A. They did not include market effects or nonparticipant spillover in their calculation. In that sense, the ADM calculation is similar to the basic NTG calculation I described earlier:

$$NTG = 1.0 – \text{free ridership} + \text{spillover}.$$

Q. How is Ameren Missouri proposing to adjust the free ridership scores?

A. Mr. Voytas cites work utilized in the 2013 Ameren Missouri potential study from Dr. David Lineweber as well as the proprietary research conducted by Dr. Lineweber's team in 2010 from YouGov, a market research firm. From Mr. Voytas' testimony:

> Q. Please provide the adjustment factors and the rationale for using them from Dr. Lineweber's work.
>
> A. Essentially, the primary adjustment for those residential respondents who rate a given program as a "10" (extremely likely to participate") and who also

> are rated as "high" on EE information/familiarity, then realistically, about 56% of those will ultimately sign up for the program (p. 24, 7-12).

This means that if a surveyed respondent said they would have without question bought the energy efficient item regardless of the Ameren Missouri rebate, admitted free riders, we should still only treat their answer as a partial free rider (56% in the most extreme case for residential respondents) and produce a downward adjustment on free rider numbers accordingly.

Q. Did Ameren apply downward adjustment across the board based on the YouGov data?

A. No. Commenting on how it would apply to the ADM surveys, Mr. Voytas states:

> We placed a higher priority on simplicity of approach rather than accuracy of the adjustment. We choose to use the highest possible free ridership adjustment factor from the table developed by David Lineweber. A more accurate but formulaically challenging approach would have been to apply the full gamut of adjustment factors ranging from 0% to 83% depending on the specific responses of individual customers to each free ridership survey question.

But what Mr. Voytas says is inconsistent with the numbers that he produces to quantify free ridership. For example here is a breakdown of his suggested changes:

Table 2: Ameren's Free Ridership Adjustments (Adapted from Voytas p. 27-28)

Program Name	**Original Free Ridership by Cadmus/ADM**	**Adjusted Free Ridership by Ameren**	**Difference**
ApplianceSavers	39%	22%	17% decrease
CommunitySavers	4%	2%	2% decrease
ConstructionSavers	72%	72%	No change
CoolSavers	25%	14%	11% decrease
LightSavers	20%	20%	No change
PerformanceSavers	17%	7%	10% decrease
RebateSavers	13%	8%	5% decrease
Business Custom	7.88%	6.54	1.34% decrease
Business Standard	4.79%	3.98%	.81% decrease
Business New Construction	6.00%	4.98%	1.02% decrease
Business Retro	33.00%	27.39%	5.61% decrease

As you can see above, some program free ridership scores did not change at all. Others changed considerably. There are no examples of free ridership scores being raised.

Q. Is this the first time Ameren Missouri has utilized this method?

A. **

**

Q. Please comment on what you received in response to your data requests.

A. I received a copy of a white paper authored by three individuals, none of whom were named David Lineweber. I also received a copy of the 2013 Ameren Missouri Market Potential Study and a copy of an email request made by Mr. Voytas in response to a data request made by stakeholders in December regarding its application to the market potential study.

[9] OPC data request 2001 sent July 11, 2014
[10] OPC data request 2002 sent July 11, 2014

Q. Please comment on the white paper study.

** **

Q. Do you have any comments regarding the omission of Dr. Lineweber from the white paper that was referenced?

A. Although I found it peculiar that he hadn't actually authored the study he was being credited for, I understand that he was likely functioning in the role of a consultant and speaking to the proprietary market data obtained by his company. Interested in what work he has authored, I searched Google for "David Lineweber," "YouGov," and "pdf," which produced the following white papers:

- Few residential customers want dynamic pricing[11]
- Residential customers say "we've done enough."[12]
- Not much trust in utility oversight[13]
- Why simply "educating" customers about energy efficiency is not likely to change behavior[14]
- Do rebates move customer purchases?[15]

The common theme in all of the articles is that consumers are not interested in energy efficiency. The last article "Do rebates move customer purchases?" in particular caught my attention because of subject matter of this filing. I found the following statement in the summary and implication sections of that article:

> Our research shows that among the quarter of US utility bill-paying households that say they have received a rebate for purchasing/installing an EE appliance or measure, the largest proportion (42%) say that the rebate had no effect on their choice. . . . Most rebates appear to be going to customers who would have purchased the more efficient option without the rebate. (p. 3).

[11] http://cdn.yougov.com/cumulus_uploads/document/mklaz9yt3u/Few-Residential-Customers-Want-Dynamic-Prices-Yet.pdf
[12] http://cdn.yougov.com/cumulus_uploads/document/p5fs55efvs/Residential-Customers-Say-Weve-Done-Enough.pdf
[13] http://cdn.yougov.com/cumulus_uploads/document/4tdhc727fy/Not-Much-Trust-in-Utility-Oversight.pdf
[14] http://cdn.yougov.com/cumulus_uploads/document/zc6hlgett5/Why-Simply-Educating-Customers-is-Not-Likely.pdf
[15] http://cdn.yougov.com/cumulus_uploads/document/b9uycc2apo/Do-Rebates-Move-Customer-Purchases.pdf

Though subject to the same bias concerns raised previously, it is curious that Ameren Missouri's authoritative source reaches this conclusion. Based upon this proprietary data from Dr. David Lineweber, one could conclude that 42% of Ameren Missouri's energy efficiency program participants are free riders and that we should adjust our net-to-gross ratio to reflect that.

White papers, grey papers, and documents created to generate and attract business from perspective clients should be held with a degree of skepticism, and should rarely (if ever) be used as a substitute for primary data. That said, it appears as though Ameren Missouri is trying to have it both ways.

Q. What do you mean by both ways?

A. Ameren Missouri is utilizing an opaque proprietary market research study and generalizing the information therein creating both smaller target goals for their potential study and higher gains for their EM&V reports. Again, I can think of no situation where it would be appropriate to utilize unsubstantiated secondary data to alter primary data collected from not one but now three sources[16] at the cost of millions of dollars in program costs (related to the potential study and now the EM&V reports) and potential millions of dollars in performance incentive award amounts.

Q. Earlier in testimony you stated that Ameren Missouri adjustments would yield 395,996 MWh in overall claimed savings. What would that number be in relation to their original PY2013 target goal?

A. It would be 165% of their original target (240,397 MWh for PY2013).

[16] That would be data collected by EnerNoc for the market potential study, and data collected by Cadmus and ADM for the EM&V reports.

Q. What would that number be in relation to their three-year MEEIA target goal?

A. It would include 49.9% of their combined three-year goal that was filed (793,100 MWh).[17]

Q. Will Ameren start collecting a performance incentive if they meet the 793,100 MWh goal by the end of 2015?

A. Yes. Ameren Missouri can receive a performance incentive at 70% of its target. Specifically, that incentive (at the 70% mark) would be 4.60% of the net shared benefits. The percentage increases incrementally 10% from that threshold up to 130% of its target at which point Ameren Missouri would then receive 6.19% of the net shared benefits. This can be seen in Table 3 below.

[17] It should be noted that the final target goal will be subject to change depending on adjustments for opt-out customers from the business side. At the moment, Ameren has assumed that there would be more opt-out customers than what has actually occurred to date. However, there are still two additional years where those assumed opt-out projections could be realized or be potentially greater. If more customers opt-out than what was anticipated than the overall target goal would be smaller.

Table 3: Performance Incentive[18]

Percent of % MWh Target	3-Year Total ($MM)	Percent of Net Benefits[19]
<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	$30.00	6.19%

Q. Is the performance incentive capped at 130%?

A. The percent of the net shared benefits is capped at 6.19% after 130% of its target is reached. But there is no cap for the overall amount of net shared benefits the utility can receive towards performance incentives. For example, Ameren Missouri could reach 165% of its targeted three-year goal and then it would recover 6.19% of every dollar of net shared benefits as its performance incentive.

[18] From appendix B to attachment A in unanimous stipulation and agreement resolving Ameren Missouri's MEEIA filing and approving stipulation and agreement between Ameren Missouri and Laclede Gas 8/1/2012 EO-2012-0142

[19] Includes income taxes (i.e., results in revenue requirements without adding income taxes). Dollar figures shown in the above table are for initial design purposes only. The performance incentive awarded will be based on net benefits. The percentages are interpolated linearly between the performance levels.

Q. You've explained that there is no cap for Ameren Missouri's performance incentive, but is there any penalty if they don't meet certain targets?

A. No. There is no penalty imposed on the utility. The performance incentive is one of three streams from which money is collected through the MEEIA process to ensure the utility is made whole. The other two are program costs and the lost revenue mechanism.

Q. Please summarize your main points regarding this section.

A.

<u>Ameren Missouri's request:</u>

- Free ridership is overstated and should be adjusted downward

<u>Ameren Missouri's rationale:</u>

- Filed evaluations suffer from self-reporting bias
- Should rely on trade allies and vendors as opposed to customers for purchase intent
- Readjust the calculation based on YouGov proprietary market research data

<u>Public Counsel's comment:</u>

- Free ridership estimates should remain what both the evaluator and auditor agreed to

<u>Public Counsel's rationale:</u>

- Evaluators are trained professionals aware of how to design, administer, and evaluate surveys
- Trade allies and vendors are more likely to produce bias due to potential conflict of interest
- Free ridership estimates are already conservative
  - Not broken into subsets like spillover
  - Very small leakage rates reported
- YouGov adjustment has no foundation
  - Opaque, 5-page, non-peer reviewed paper from 2010 without context should not be used as a substitute or used to modify primary data collected on Ameren ratepayer behavior
  - Adjustments made to free ridership estimates are not clear

Q. What is your conclusion regarding Ameren Missouri's free ridership change request?

A. There is overwhelming evidence to suggest that adjusting free ridership scores downward is unwarranted. I recommend that commission rely on the independent evaluators' and auditor's conclusion regarding this estimate.

III. RESPONSE TO AMEREN MISSOURI'S STATEMENT REGARDING MARKET EFFECTS

Q. What is Ameren Missouri's change request statement regarding market effects?

A. Ameren Missouri requests that the Commission recognize and approve market effects for the LightSavers program.

Q. Does Ameren Missouri provide any support of what constitutes market effects?

A. Yes. Ameren Missouri provides overly broad definitions and a list of examples to define market effects or market transformation including:

- Ameren Missouri's efforts leading to new appliance efficiency standards and/or building codes
- Increased levels of awareness of energy efficient technologies among customers and suppliers
- Increased availability of efficient technologies through retail channels
- Reduced prices of efficient models
- Build-out of efficient model lines
- Ultimately, the increased market share for efficient goods, services, and design practices (Voytas 30, 4 – 16).

Q. Please respond.

A. Using Ameren Missouri's standard, there is no way to meaningfully isolate Ameren's influence on market effects. All of these examples listed, with the exception of building codes, describe what every energy efficiency program does by default. To illustrate this, look at Ameren's CoolSavers program which gives a rebate for HVACs. Under the examples above, one could make an argument that the HVAC program should be rewarded market effects because

- Energy efficient HVAC systems prices were reduced through a ratepayer rebates
- There was associated advertising for the program which presumably led to some level of education for ratepayers
- The program was promoted to retailers that formerly did not have the rebate option
- Any acceptance of the energy efficient HVAC would be building out less efficient HVACs saturated in the market
- New HVAC standards will come on line in the future, but by simply offering the program it would be encouraging acceptance towards that standard.

Ameren Missouri's standard for assessing the presence of market effects is simply not meaningful; it offers no way to draw distinctions. Under this standard, if you have a program then there are market effects. To give Ameren Missouri an additional boost in energy savings for simply having the program is equivalent of giving a student a diploma for simply showing up to school.

Q. Can market effects decrease the net-to-gross ratio?

A. I have never seen an example of market effects utilized for that purpose. Conceptually, I have a difficult time understanding how that could work. In a response to Staff's question regarding market effect calculations in DR-0057, Mr. Voytas states that "Market effects can result in either an increase or decrease in the estimation of net-to-gross." The basis for this statement seems to stem from an excerpt he quoted in his testimony from the SEE "Energy Efficiency Program Impact Evaluation Guide" which states:

> Market Evaluations: a very broad category of activities that document aspects of the marketplace with respect to energy efficiency. One particular type is a market effects evaluation, which characterizes changes in the structure or functioning of a market or the behavior of market participants that resulted from one or more program efforts. Market effects evaluations can include projections of impacts that a market could have on future energy efficiency efforts. If the evaluator's goal is to assess the cost-effectiveness for stakeholders or regulators, excluding the measurement of market effects could result in underestimating **(or possibly overestimating)** a program's overall benefits or cost-effectiveness (emphasis added).

The "or possibly overestimating" excerpt above that is in parenthesis seems to be the basis for Mr. Voytas claiming that market effects could be adjusted to negatively impact the net-to-gross. In practice, this would be difficult to prove. Under such a scenario, consumers would make energy inefficient choices as a direct result of Ameren's energy efficiency efforts.

Q. Were there any programs that failed to live up to their expectations?

A. Of course. Many of the programs had difficultly gaining significant traction during the first year. This is not unusual.

Q. Did any of those programs utilize a downward projection of market effects in their calculation?

A. No. There was only one program that utilized market effects, the LightSavers program, and it was used in an upward projection.

Q. Does Mr. Voytas address how market effects differ from spillover?

A. No. He is less clear on their differences. In his original testimony filed for the Ameren MEEIA application in 2012, Mr. Voytas focused on defining free ridership and spillover with a passing reference to market effects. In the latest direct testimony filed in response to the change request, he focuses his testimony on defining free ridership and market effects with a passing reference to spillover.

Q. How does the Uniformed Methods Project define spillover?

The Uniformed Methods Project breaks down spillover into participant (with four subtypes) and nonparticipant spillover. I will provide the definition and restate my own example to illustrate it.

Participant spillover: This represents the additional energy savings that are achieved when a program participant—as a result of the program's influence—installs EE measures or practices outside the efficiency program after having participated.[20]

Example: An Ameren Missouri ratepayer buys an Ameren Missouri rebated CFL, becomes more energy efficiency conscious as a result of the purchase and then decides to buy an energy efficient TV (that is not rebated by Ameren).

Nonparticipant spillover: This represents the additional energy savings that are achieved when a nonparticipant implements EE measures or practices as a result of the program's influence (for example, through exposure to the program) but is not accounted for in program savings.[21]

[20] Violette, D. & Rathburn, P. (2014) Chapter 17: Estimating Net Savings: Common Practices. National Renewable Energy Laboratory. http://www.nrel.gov/docs/fy14osti/62678.pdf
[21] Ibid.

Example: An Ameren Missouri ratepayer sees an Ameren Missouri energy efficiency commercial on TV and as a result of that commercial decides to buy an energy efficient TV (that is not rebated by Ameren Missouri).

Q. What does the Uniformed Methods Project say about market effects?

A. The Uniformed Methods Project gives two paragraphs on the subject as follows:

> Market effects refer to "a change in the structure of a market or the behavior of participants in a market that is reflective of an increase in the adoption of energy efficiency products, services, or practices and is causally related to market intervention(s)" (Eto et al. 1996). For example, programs can influence design professionals, vendors, and the market (through product availability, practices, and prices), as well as influence product or practice acceptance and customer expectations. All these influences may induce consumers to adopt EE measures or actions (Sebold et al. 2001).
>
> Some experts suggest that market effects can be "best viewed as spillover savings that reflect significant program-induced changes in the structure or functioning of energy efficiency markets." Prahl et al. (2013) also suggest that market transformation is a subset of market effects (as the substantive and long-lasting effects). This view implies that market effects are a subset of spillover. **Although spillover and market effects are related, the methods used to quantify these two factors generally differ.** Therefore, this chapter addresses them separately (emphasis added).[22]

What we have here are two terms, spillover and market effects, that are similar but calculated differently. Within those two paragraphs there is also a footnote that sheds some additional insight on this issue:

[22] Ibid.

> When assessing EE polices in a broad context, it should be acknowledged that some participants identified as free riders in a current program might not have the opportunity to adopt the EE measure or service were it not for the effects on the market from previous EE program efforts. These efforts may have contributed to that measure or service being available to customers in the current year. **<u>The importance of this issue to evaluation depends on the parameters of the evaluation</u>**. Most evaluations focus on set time periods spanning 1-3 years. Factors that are included are based on the incremental actions taken as a result of the EE program year being evaluated and the current state of the EE market. **<u>Actions taken that resulted from EE efforts in preceding years represent sunk costs and are not incremental to the current program being evaluated.</u>** However, this may be an important consideration in a broader policy assessment examining the overall trend in the adoption of EE measures and services across a longer time period. Market effects of previous years' programs may not have been fully accounted for, and this can be a consideration in the broader policy context. **<u>However, for assessing the impacts of a given EE program for a given year, these effects from past programs are not generally considered.</u>** This is discussed in more detail in Section 3.3. (emphasis added).[23]

An Ameren MEEIA program implemented in 2013 should be evaluated as an incremental investment. That is, a program implemented in 2013 should be evaluated against what is attributable to that investment only—all impacts from prior years' programs are essentially sunk costs and should not be considered. This is what parties agreed to in 2012 in the Unanimous Stipulation and Agreement filed as a result of Ameren's MEEIA application and stated on page 4 and 5 of the document (5.b.ii).

[23] Ibid.

> NSB Relating to the Performance Incentive. After the conclusion of the three-year Plan period, using final Evaluation, Measurement and Verification ("EM&V") results (with EM&V to be performed after each of the program years 1,2, and 3), Ameren Missouri will be allowed to recover the performance incentive, which is the percentage of NSB as described on Appendix B attached hereto and incorporated herein by this reference (the "Performance Incentive Award"). The cumulative net megawatt-hours ("MWh") determined through EM&V to have been saved as a result of the MEEIA Programs will be used to determine the amount of Ameren Missouri's Performance Incentive Award, with the cumulative net MWh performance achievement level (expressed as a percentage) being equal to 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 Plan period). The targeted net energy savings caused by actual opt-out. **Actual net energy savings for each program year will be 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, with the sum of the three years' actual net energy savings to be used to determine the amount of the Performance Incentive Award.** Recovery of the Performance Incentive Award is addressed in paragraph 6.c. (emphasis added).[24]

The parameters of the evaluation are clearly set to be the three-year period of 2013-2015 in the Unanimous Stipulation and Agreement entered into by parties in 2012. Any actions taken that resulted from energy efficiency efforts in preceding years represent sunk costs and are not incremental to the current program being evaluated. Because of these parameters,

[24] Unanimous stipulation and agreement resolving Ameren Missouri's MEEIA filing and approving stipulation and agreement between Ameren Missouri and Laclede Gas, filed on 8/1/2012, File No. EO-2012-0142.

market effects qualify as double counting of spillover in this evaluation, and thus, overstating the actual energy savings obtained.

Q. Have any other states recognized the use of market effects, nonparticipant spillover and participant spillover simultaneously in their determination of the net-to-gross ratio?

A. Not to my knowledge, and not under similar regulatory and incentive structures as Missouri.

Q. What do you mean by similar regulatory and incentive structures?

A. Table 4 is copied from a March 2014 Issue brief from the Edison Foundation: Institute for Electric Innovation titled, "*Summary of Electric Utility Customer-Funded Energy Efficiency Savings, Expenditures, and Budgets.*" It outlines 52 regulatory frameworks for electric efficiency programs sorted by annual state electric efficiency budgets.

Table 4: Regulatory Framework and 2013 Electric Efficiency Budgets (Sorted by Budget)

Table 7: Regulatory Framework and 2013 Electric Efficiency Budgets (Sorted by Budget)

Rank	State/Region	2013 Electric Efficiency Budgets	Fixed Cost Recovery		Performance Incentive	Energy Efficiency Resource Standard
			Decoupling	Lost Revenue Mechanism		
1	CA	$1,503,323,248	Yes		Yes	Yes
2	NY	$610,887,944	Yes		Yes	Yes
3	FL	$509,045,607				Yes
4	MA	$475,642,766	Yes		Yes	Yes
5	NJ	$407,323,844				
6	PA	$247,530,848				Yes
7	OH	$223,662,799	Yes	Yes	Yes	Yes
8	IL	$221,260,111				Yes
9	TX	$221,228,986				Yes
10	WA	$199,043,798	Yes			Yes
11	*NW	$169,381,147	Yes	Yes	Pending	Yes
12	AZ	$164,334,468		Yes	Yes	Yes
13	MI	$154,801,089			Yes	Yes
14	IN	$147,919,951		Yes	Yes	Yes
15	IA	$133,175,420				Yes
16	OR	$121,323,558	Yes			Yes
17	NC	$117,378,033		Yes	Yes	Yes
18	MN	$116,161,625			Yes	Yes
19	MD	$104,249,593	Yes			Yes
20	CT	$87,605,782	Yes		Yes	
21	CO	$85,452,078		Yes	Yes	Yes
22	WI	$79,939,703	Yes		Yes	Yes
23	AR	$72,724,333		Yes	Yes	Yes
24	OK	$72,642,696		Yes	Yes	
25	GA	$71,542,543		Yes	Yes	
26	RI	$67,599,587	Yes		Yes	Yes
27	TN	$59,312,520				
28	KY	$54,615,523		Yes	Yes	
29	NV	$51,910,000		Yes		Yes
30	MO	$50,699,065		Yes	Yes	
31	UT	$44,331,931				Voluntary
32	VT	$42,764,449	Yes		Yes	Yes
33	AL	$34,798,146		Yes	Yes	
34	SC	$33,668,980		Yes	Yes	
35	HI	$33,483,031	Yes		Yes	Yes
36	NM	$32,881,071		Yes	Yes	Yes
37	ID	$30,772,991	Yes			
38	ME	$20,541,187				Yes
39	NH	$17,355,360			Yes	
40	NE	$15,075,866				
41	KS	$14,751,941		Yes		
42	DC	$13,956,057	Yes		Yes	
43	MT	$10,585,871		Yes	Pending	
44	MS	$10,052,594		Pending	Pending	
45	WV	$9,867,727			Pending	
46	WY	$4,855,345		Yes		
47	LA	$3,650,000		Yes	Yes	
48	SD	$1,824,209		Yes	Yes	
49	ND	$940,432				
50	VA	$868,786		Pending		Voluntary
51	AK	--				
52	DE	--	Pending			Pending

This table shows us a number of different things in terms of the level of energy efficiency being conducted in the United States. It also illustrates why comparison between states are extremely difficult. The budgets, history and regulatory structures are contextually sensitive.

The last four columns on the table break down differences in regulatory structures for a given state/region's energy efficiency program. THe first two represent the fixed cost recovery—how the utility is made whole—for promoting a practice that would otherwise be detrimental to their traditional business model. Options for fixed cost recovery include either decoupling or a lost revenue mechanism. In Missouri, we have a lost revenue mechanism.

Additionally, some states have a performance incentive and some states have energy efficiency resource standards (EERS) that they have to meet. In Missouri, MEEIA allows utilities the opportunity to earn a performance incentive, but no utility is mandated to produce an energy efficiency program. There are no EERS to meet in Missouri.

Q. What states would be appropriate to compare Missouri with?

A. Table 5 highlights the states that have similar energy efficiency regulatory structures as Missouri. I view these states that share similar regulatory and incentive structures as the most relevant for an accurate and fair comparison.

Table 5: States with similar regulatory and incentive structures to Missouri

Rank	State	2013 Electric Efficiency Budget	Decoupling	Lost Revenue Mechanism	Performance Incentive	Energy Efficiency Resource Standards (EERS)
Oklahoma	24	$72,642,696	No	Yes	Yes	No
Georgia	25	$71,542,543	No	Yes	Yes	No
Kentucky	28	$54,615,523	No	Yes	Yes	No
Missouri	30	$50,699,065	No	Yes	Yes	No
Alabama	33	$34,798,146	No	Yes	Yes	No
South Carolina	34	$33,668,980	No	Yes	Yes	No
Louisiana	47	$3,650,000	No	Yes	Yes	No
South Dakota	48	$1,824,209	No	Yes	Yes	No

Regarding the last two tables, it may help to keep this school grading analogy in mind. Most secondary education schools in the U.S. operate under a 4.0 grading scale where:

A	4.0
B+	3.5
B	3.0
C+	2.5
C	2.0
D+	1.5
D	1.0
F	0.0

All things being equal, a 4.0 student is judged to be better than a 3.0 student. However, things are ever rarely equal. This is especially true when comparing students across different schools. An honor student at one school might only be an average student at another school. Context and the evaluation criteria under which the grades are administered matters. This is why universities rely so heavily on standardized tests for admittance. In the world of energy efficiency EM&V, there is no SAT or ACT to standardize the comparison. At best, you need to look at states that share similar regulatory structures for an accurate, relevant comparison.

Q. Have any of these similar states utilized market effects in their EM&V calculation?

A. I could find no examples of any EM&V reports in the aforementioned states that had market effects as part of their net-to-gross calculation. All of the EM&V reports evaluated savings against what was attributable to the investment made in the period under its evaluation.

Q. What key differences exist between states that have utilized market effects in their EM&V calculations and states like Missouri that have not used market effects?

A. The one common characteristic exhibited by states that have attempted to utilize market effects in their net-to-gross calculations is that they have mandated energy efficiency resource standards (EERS) to meet. It is understood that states with EERS's in place have agreed to creative and aggressive reporting requirements which allow them credit for much larger savings as a result of their programs efforts.

Q. Can you cite any source that shares your opinion that states with EERS's have agreed to creative and aggressive reporting requirements?

A. Yes. Ameren Missouri shares my sentiment. As filed in EW-2012-0065 and stated as a Response to the National Resource Defense Council's comments regarding the opportunities for Missouri to build on clean energy successes to meet new federal carbon standards, the following statement and reply is made:

> NRDC Perspective No. 4: MEEIA set soft targets which, if met, would result in a cumulative reduction in load of 18% for the major investor owned utilities by 2030.
>
> [Ameren Missouri] Reply: NRDC states that leading states already today are meeting the aggressive EERS annual load reduction targets. The fact of the matter is that leading states with EERS in place have agreed to creative and aggressive approaches to report that they have met aggressive annual load reduction goals. . . . Creative and aggressive reporting includes the following:
>
> **a.** **<u>Report gross rather than net savings for energy efficiency programs</u>**
>
> **b.** **<u>Take credit for achieving</u>** legislated building codes and appliance **<u>efficiency standards</u>**
>
> c. Take credit for customer self-directed energy savings
>
> d. Apply a multiplier to energy efficiency savings if demand response programs are also enacted
>
> e. Take credit for utility infrastructure energy efficiency improvements
>
> f. Take credit for combined heat and power energy savings as energy efficiency
>
> g. Allow a portion of renewable energy to count towards meeting energy efficiency mandates

> h. Use alternative cost effectiveness test and avoided cost constructs to allow more energy efficiency measures to be cost effective
>
> i. **<u>Take credit for prior years (prior to EERS standards effective dates) energy efficiency savings</u>**.
>
> If Missouri is willing to allow, and the EPA is willing to accept, creative and aggressive reporting approaches similar to those states where EERS is the energy efficiency operating model, Missouri may have a more realistic possibility of achieving the 2030 cumulative load reduction targets set by the EPA. **<u>That being said, the use of creative reporting of annual customer load reductions attributable to utility energy efficiency programs will overstate the actual benefits received by customers directly attributable to utility sponsored energy efficiency program costs</u>** (emphasis added).[25]

Ameren is critical of NRDC's assertion of obtainable energy efficiency targets based on what they feel is not an "apples-to-apples" comparison. Ameren Missouri claims that reaching such high targets is impractical and distorts the actual savings that are attainable. Ameren Missouri makes a point of this by including its three-year MEEIA targets in an earlier response:

<u>Table 6: Ameren MEEIA Target Goals</u>

	2013	2014	2015	Total
Energy Efficiency Savings (MWh)	**240,397**	255,445	297,260	793,102

[25] File No. EW-2012-0065, *Ameren Missouri's Reply to Certain Stakeholder Responses,* filed on 9/16/2014, pp. 13-15.

Q. Is Ameren taking credit for these items in this case?

A. Yes. The savings Ameren Missouri is claiming they achieved based on their first-year evaluation would suggest that either the NRDC is correct in their assertion, or that Ameren Missouri is attempting to utilize aggressive and creative reporting.

Table 7: What Ameren is claiming happened here

	2013	2014	2015	Total
Energy Efficiency Savings (MWh)	**397,499**			397,499

For example, Ameren Missouri is taking credit for prior year's energy efficiency savings by including the quantification of creative and aggressive reporting in the form of market effects which overstate the actual benefits received by ratepayers and is directly attributable to Ameren's MEEIA PY2013 program costs (see bullet point i. above from Ameren response).

Additionally, Ameren Missouri seeks to benefit from the timing of federally-mandated efficiency standards resulting from the Energy Independence and Security Act of 2007, which collectively raised the energy efficiency standard for light bulbs (see bullet point b. above from Ameren response). This point will be discussed later in my testimony.

The Commission also should take note that the first example listed under creative and aggressive reporting includes the reporting of gross estimates rather than net estimates for energy savings. This is because under almost all EM&V scenarios the net estimates will be smaller than the gross estimates. However, in this case, the net estimates Ameren is claiming are larger.

The use of creative and aggressive evaluations to quantify savings forces ratepayers to bear the additional financial penalty of rewarding Ameren an incentive in excess of a million dollars, millions more for future program year evaluations, and likely a precedent that will be cited by other Missouri electric IOUs in their future MEEIA recovery.

Q. Please summarize your main points regarding this section.

A.

Ameren Missouri's request:

- The Commission should recognize market effects from the Cadmus study

Ameren Missouri's rationale:

- Calculating market effects is a recognized practice
- They are real and Ameren Missouri's program produced them

Public Counsel's comment:

- Market Effects did not occur in PY2013 for the LightSavers program and should not be included in the final calculations

Public Counsel's rationale:

- Market effects are loosely defined and can be applied arbitrarily
- Market effects have not been applied to evaluations with states with Missouri's regulatory and incentive structure
  - There are no energy efficiency resource standards in Missouri
- Market effect studies represent previous years program efforts and are not incremental to the current program year under evaluation
  - Market effects and spillover represent double-counting in PY2013
  - 2012 Unanimous Stipulation and Agreement clearly intends for evaluation to consist of a three-year program range (2013 – 2015)
- Market Effects represent creative and aggressive reporting that overstate the benefits received by customers directly attributable to program costs

IV. RESPONSE TO STAFF'S CHANGE REQUEST FOR THE EXCLUSION OF MARKET EFFECTS

Q. What is Staff's Change Request asking for?

A. Staff's Change Request recommends that the Commission reject the adjustment for market effects in the calculation of net-to-gross. Staff specifically presents three recommendations:

- Accept the Auditor Report with no market effects, but if not, then

- Accept the Cadmus & ADM Reports with no market effects, and
- Direct future evaluations to exclude market effects for PY2014 and PY2015

Q. On what basis does Staff base their Change request?

A. Staff's change request centers primarily on two factors.

- That there are no accepted best practices for the calculation of market effects
- That Cadmus is utilizing data prior to PY2013 to quantify market effects when the 2012 Stipulation and Agreement clearly states the evaluation should be confined to the single program year.

Staff also states how they formally notified Ameren Missouri about their concerns when it came to their attention that Cadmus was attempting to calculate market effects in their evaluation over a year before the final results were presented.

Q. Please respond to Staff's Change Request.

A. The OPC agrees with Staff that market effects should not be included for the LightSavers program and should not be applied to the final estimate of the net-to-gross ratio for PY2013. There are no accepted best practices for the quantification of market effects. Moreover, the quantification of market effects is attempting to take credit for benefits that occurred prior to the program year evaluation and are not directly attributable to the program itself. Public Counsel does not have a strong opinion on whether or not the Commission should accept the Auditor Report or the Cadmus/ADM Report. Final results from both are very close after market effects are eliminated from the formula. However, the Cadmus/ADM calculation of spillover balances out the report's conservative estimates of free ridership, and so, may be the superior document.

To be sure, market effects can happen. They just did not happen here in one year nor can they be reasonably attributed to Ameren Missouri's actions independent of the factors explained in this testimony. The quantification of market effects is contextually sensitive and requires a collective effort in design, coordination and execution from stakeholders prior to implementation.

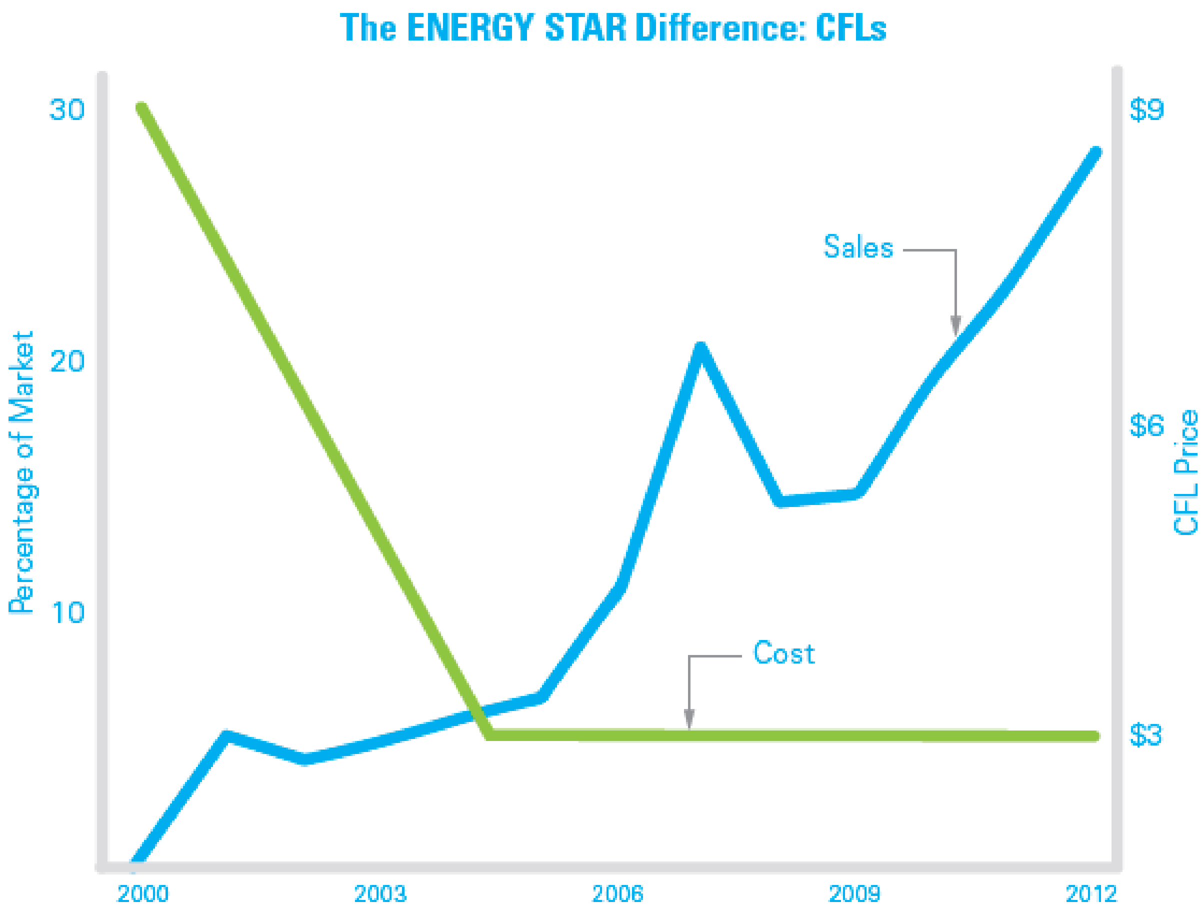
Q. Is there additional evidence to support Staff's assertion that the inclusion of market effects in the net-to-gross calculation is unwarranted?

A. Yes. I will provide additional examples to illustrate that market and regulatory forces influenced efficient lighting uptake in Ameren Missouri's territory, and which make it unreasonable for Ameren Missouri to claim or receive additional credit for market transformation in PY2013. I also will provide sales information released by Home Depot which illustrates realistically what would have occurred absent Ameren Missouri's upstream lighting program in PY2013.

Q. Please provide your additional examples that contradict Ameren's market effect assertion.

A. **Wal-Mart's influence on the retail market**

Naturally-occurring adoption of CFLs has been on the rise since 2006. This can be seen in the growth of CFL market penetration despite the consistent $3.00 cost per bulb in the line graph provided by ENERGYSTAR below.



In the years after CFLs were added to the ENERGY STAR program, an increase in sales led to economies of scale that lowered product costs and brought the purchase price down dramatically. Lower prices and improved performance led to the first peak in sales in 2007, when media attention around the danger of global warming was high. That same year, Walmart sold 100 million CFLs. Today, ENERGY STAR qualified CFLs represent about a quarter of all U.S. light bulb shipments. [26]

There are several important things to notice about this line graph. First, is the upward trajectory of CFL sales occurring into 2012 despite the flat price of $3.00 for CFL bulbs over the previous six-years. The second is the initial large spike in sales that occurred between 2006-2007.

[26] ENERGYSTAR (2012) Product Retrospective: Residential Lighting
http://www.energystar.gov/ia/products/downloads/Residential_Lighting_Highlights.pdf

That spike (and the continued increase) in nationwide sales of CFLs is largely the result of actions taken by retail giant Wal-Mart. In 2006, Wal-Mart publicly pledged to move 100 million CFLs in a year.

This pledge literally changed the lighting market. An increase in sales of a 100 million CFLs represented an increase of approximately 50 percent of CFL sales from the previous year.[27] It also had enormous implication for the lighting manufacturers. Because CFLs last up to eight years, giant light bulb manufacturers would sell far fewer bulbs moving forward. The announcement was met with resistance, but ultimately was accepted because of Wal-Mart's retail position.

> "When Wal-Mart sets its mind to something with a narrow objective like that, they are going to make it happen," said Jim Jubb, vice president for consumer product sales at Sylvania.[28]

On Oct 2, 2007, Wal-Mart announced it had surpassed its goal three months early and in a press released it outlined its efforts towards that goal including:

- Introduce a private CFL at Wal-Mart under the Great Value brand that retails at four bulbs for the cost of three regularly priced brand name CFLs;
- Offer online orders at both www.walmart.com and www.samsclub.com, and put an online savings calculator on the Sam's Club Web site;
- Increase shelf space, offer more selection and move bulbs to eye level for easiest access;

[27] Barbaro, M. (2007) Wal-Mart puts some muscle behind power-sipping bulbs. *New York Times*. http://www.nytimes.com/2007/01/02/business/02bulb.html?pagewanted=all&_r=0
[28] Ibid.

- Increase interactive displays in select Wal-Mart stores to allow customers to compare qualities and styles, and demonstrate the potential savings associated with each type of CFL;

- Work with manufacturers to lower the mercury content of the CFLs sold at Wal-Mart stores and Sam's Clubs, making them safer and more efficient; and

- Partner with Yahoo!, Lawrence Bender, the Department of Energy's ENERGY STAR program, Environmental Defense and hundreds of others on the 18Seconds movement to promote energy efficiency.[29]

Wal-Mart's CFL pledge and continued commitment to energy efficient lighting was instrumental in changing the lighting market across America. Within two years (Sept. 8, 2010), the last major General Electric factory making ordinary incandescent light bulbs in the United States closed in Winchester, Virginia.[30]

Wal-Mart's market-changing strategies, illustrated in the bullet points above, would be copied and implemented by utility upstream lighting programs across the country over the next eight years. Seven years after Wal-Mart laid the blueprint, Ameren Missouri would follow suit and then proceed to cite many of the same actions as justification for the inclusion of market effects in Ameren Missouri's net-to-gross calculation.

If a goal of an upstream lighting program is to transform a market, it would appear as though that job had at least in part already been done by other actors, namely Wal-Mart, in the eight years preceding PY2013. Accordingly, adoption of energy efficient lighting has been naturally occurring for years due to actions taken by other actors years ago.

[29] Wal-Mart (2007) Wal-Mart surpasses goal to sell 100 million compact fluorescent light bulbs three months early http://news.walmart.com/news-archive/2007/10/02/wal-mart-surpasses-goal-to-sell-100-million-compact-fluorescent-light-bulbs-three-months-early
[30] Whoriskey, P. (2010). Light bulb factory closes, End of era for U.S. means more jobs overseas. Washington Post. http://www.washingtonpost.com/wp-dyn/content/article/2010/09/07/AR2010090706933.html

Coincidently, in 2013, Wal-Mart began promoting the next stage of efficient, safe lighting—LEDs. In October, Wal-Mart introduced 26 Great Value LED light bulbs that would sell for less than $10.00 (60 watt retailed at $8.88) in all U.S. stores.[31] LEDs provide a little more energy savings than CFLs annually, but they last much longer (twice as long lifespan), and do not contain any hazardous materials if broken (CFLs contain very small amounts of mercury).

Although the delta in energy savings between LEDs and CFLs is much smaller than between standard incandescent lighting and CFLs, the continued promotion of CFLs in Ameren's service territory may have the unintended consequence of slowing the adoption rate of the more efficient LEDs.

California and Previous Utility-Sponsored Energy Efficiency Programs

Between 2006 and 2008 the three largest utilities in the state of California[32] implemented an upstream lighting program that ultimately included moving 112,692,637 total energy efficient light bulbs. Of that total number, approximately 96 million light bulbs represented standard CFLs.[33] Following an attempt to measure the impact of one of the largest single energy efficiency programs ever implemented, the Energy Division of the California Public Utilities Commission (CPUC) released its evaluation of the three-year program period in 2010. The goal of the evaluation was to estimate how much electricity was saved and how much peak demand was reduced through the programs. The study was also an attempt by CPUC to estimate how much of the savings would have happened in the absence of the program, in other words, a measurement of the net-to-gross ratio. The conclusion resulting from the study states:

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[31] WalMart (2013) Walmart launches Great Value LED lightbulbs for less than $10 in all U.S. stores. http://news.walmart.com/walmart-launches-great-value-led-lightbulbs-for-less-than-10-in-all-us-stores
[32] Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric respectively.
[33] KEMA, Cadmus (2010) Final Evaluation Report: Upstream Lighting Program Volume 1. http://www.calmac.org/publications/FinalUpstreamLightingEvaluationReport_Vol1_CALMAC_3.pdf

> The conjoint study showed price is important to consumers, particularly as they choose between different types of CFLs. **However, it is not clear price is as important to consumers when choosing between a CFL and an incandescent bulb, as long as consumers fully understand the overall costs and benefits of choosing a CFL over an incandescent bulb and have the desired CFL readily available.** The concurrent focus groups concluded certain consumers reject CFLs or all fixtures due to non-price considerations, such as light color, fit, and mercury concerns. For these consumers, decreasing prices are not likely to cause increased purchases of CFLs.
>
> As noted above, the limitations of the study led The Team to not use the findings in the final NTG estimation for Upstream CFLs. These results may be helpful for future program design and evaluation, as they do indicate that with proper information regarding cost vs. payback consumers are likely to choose a CFL, even at higher price points (emphasis added).[34]

The study recommended a net-to-gross ratio for the three-year period of 0.54.

The results of this study were highly contentious and and directly led to a renewed interest within the EM&V community to investigate quantifying concepts like market effects. In fact, the Cadmus article referenced in Mr. Voytas' testimony (and referred to earlier in this testimony) *The Trouble with Free Riders* is largely a response to the CPUC conclusions.

As an outcome of the program, as well as ensuing state legislation on efficient lighting, [35] California modified their upstream lighting program to place an increased emphasis on

[34] KEMA, Cadmus (2010) Final Evaluation Report: Upstream Lighting Program Volume 2. http://www.calmac.org/publications/finalupstreamlightingevaluationreport_vol2_calmac.pdf

[35] Huffman Bill (AB 1109): Signed on Oct. 12, 2007. The bill required reductions in energy usage for lighting, encouraged more efficient lighting technologies, reduced hazardous waste in lighting and increased recycling opportunities. http://www.cawrecycles.org/issues/current_legislation/ab1109_07

specialty CFLs and LEDs through their Advanced Consumer Lighting programs in 2009.[36] That is, in 2009, California already was cognizant of the fact that efficient lighting needed to move beyond standard CFLs.

The Energy Independence and Security Act of 2007 (EISA)

Another factor offsetting the impact that Ameren Missouri had on the lighting market in PY2013 is the effect of the EISA. At its heart, EISA was intended to change the market. Among the stated goals:

> To move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes.[37]

One of EISA's most prominent initiatives included setting minimum efficiency standards for general service light bulbs (incandescent, halogens, CFLs, LEDs) which included the following phase-in ranges and dates as seen in Table 8:

[36] California Public Utilities Commission (2009) Market Transformation Opportunities. http://webcache.googleusercontent.com/search?q=cache:PFiElRGIqu0J:www.cpuc.ca.gov/NR/rdonlyres/E30E2C04-2465-4841-8051-078FB4DF8640/0/MarketTransformationOpportunities_PerspectivesonStatewideLightingMarketTransformationProgra.ppt+&cd=1&hl=en&ct=clnk&gl=us

[37] Energy Independence and Security Act of 2007. US Government Printing Office. http://www.gpo.gov/fdsys/search/pagedetails.action?granuleId=&packageId=BILLS-110hr6enr

Table 8: EISA Phase-In Standards[38]

Today's Bulb (2007)	After the Standard	Standard Effective Date
100 watt	72 watts	January 1, 2012
75 watt	53 watts	January 1, 2013
60 watt	43 watts	January 1, 2014
40 watt	29 watts	January 1, 2014

The long phase-in periods gave vendors and manufacturers four-to-seven years to sell off their remaining inventory of standard incandescence light bulbs.

The EISA's standards ultimately were not enforced due to a last-minute rider passed in the U.S. House in 2011. But according to lighting industry leaders, the long phase-in effectively made this a non-issue:

> "The industry has moved on," said Larry Lauck a spokesman for the American Lighting Association. Lacuk said U.S. light bulb manufacturers have already "retooled" their production lines to build more efficient bulbs, he said.
>
> Joseph Higbee, a spokesman for the National Electrical Manufacturers Association, which represents 95 percent of U.S. light bulb manufacturers, said even if the Department of Energy does not have the funding to enforce the

[38] Adapted from ENERGYSTAR (2007) Energy Independence and Security Act of 2007 (EISA) Frequently Asked Questions. http://www.energystar.gov/ia/products/lighting/cfls/downloads/EISA_Backgrounder_FINAL_4-11_EPA.pdf

> energy efficiency standards, manufacturers are not going to retro-fit their assembly lines to produce the traditional, less-efficient bulbs. [39]

Today you can still buy an incandescent light bulb at your local Lowe's, but it is likely going to be replaced on the shelf with a CFL or LED thereafter as purchased inventory of inefficient incandescent inventory decreases.[40]

As the EISA standards began to be phased in, state regulatory commissions began adjusting net-to-gross ratios for standard CFLs to more accurately reflect the change in the baseline. For example, in Missouri the CFL net-to-gross ratios were adjusted for KCPL's most recent approved MEEIA portfolio which allowed the company to claim gross savings of 0.90 in 2014 and then 0.75 in 2015 for each CFL sold. Prior to this, all CFLs would have received a 1.0 gross savings amount.

However, unlike KCPL, Ameren Missouri will continue to receive the gross savings amount of 1.0 for CFLs in PY2014 and PY2015, as those numbers were agreed to by parties in 2012.

The rationale behind the decrease in gross savings reflects the concern that ratepayers should not subsidize a light bulb that is increasingly the only option on the market.

Federal standards that pushed manufacturers, vendors and customers to adopt the more efficient standards contributed greatly to the promotion of the CFL market in PY2013 and in the ensuing years leading up to the Cadmus evaluation. The impact of EISA standards on the light bulb market cannot be understated, as it clearly represents a government-driven market effects program.

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[39] Bingham, A. (2011) Congress defunds ban on incandescent light bulbs but doesn't quite save them. ABC News. http://abcnews.go.com/blogs/politics/2011/12/congress-defunds-ban-on-incandescent-light-bulbs-but-doesnt-quite-save-them/

[40] Johnson, A.M. (2013) Hey! Who turned out the lights? Incandescent bulb ban just one of new year's new laws. NBC News: U.S. News. http://usnews.nbcnews.com/_news/2013/12/30/22114574-hey-who-turned-out-the-lights-incandescent-bulb-ban-just-one-of-new-years-new-laws?lite

Ameren Illinois' upstream lighting rebate program

Cadmus's LightSavers report gives four "other metrics" to justify the increase for market effects:

- Customer familiarity with CFLs is increasing
- Customer purchase rates are increasing
- Retail store program participation has increased
- Retail stocking of non-discounted CFLs and LEDs has increased[41]

As explained earlier, Cadmus is claiming that their LightSavers metrics showed an increase in 2013 from its study in 2010. However, Staff's Report goes to great lengths to describe what happened between the two studies prior to the MEEIA PY2013 that would have contributed to these factors. There is, though, an additional reason to explain the increase in CFL usage and familiarity from 2010 to 2013 beyond any of those mentioned to date—Ameren Illinois' upstream lighting program.

In PY2012, the fourth year of their lighting program, Ameren Illinois moved 4,379,576 energy efficient light bulbs, with approximately 94% representing standard CFLs sold through the upstream program.[42] One year later (2013) Ameren Illinois' program moved 2,821,350 light bulbs in their fifth program year.[43] Ameren Missouri, by comparison, began the first year of their approved MEEIA portfolio and their LightSavers program in 2013 and moved 4,166,201 energy efficient light bulbs. A quick review of the two year's programs and respective program net-to-gross ratios can be seen below in Table 9.

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[41] Cadmus (2013) Ameren Missouri LightSavers Impact and Process Evaluation: Program Year 2013 page 54

[42] Opinion Dynamics Corporation (2012) Impact and Process Evaluation of Ameren Illinois Company's Residential Lighting Program (PY4). http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU%20Evaluation%20Reports%20EPY4/AIC_PY4_Residential_Lighting_Program_Final_Report.pdf

[43] Opinion Dynamics Corporation (2014) Impact and Process Evaluation of Ameren Illinois Company's Residential Lighting Program (PY5). http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU%20Evaluation%20Reports%20EPY5/AIC_PY5_Residential_Lighting_Report_FINAL_2013-01-22.pdf

Table 9: Ameren Illinois and Ameren Missouri Comparison

	PY 2012	PY 2013
Ameren Illinois	4,379,576 bulbs	2,821,350 bulbs
- Net-to-gross ratio	0.83 NTG	0.47 NTG
Ameren Missouri	No program	4,166,201 bulbs
- Net-to-gross ratio		1.25 NTG

Given the geographic proximity between Ameren Illinois and Missouri, it is reasonable to conclude that many of the market effects that are being claimed by Cadmus as a result of comparing data from 2010 to 2013 are actually market effects that should be attributed to Ameren Illinois.

Over 4 million CFLs were moved in southern Illinois in 2012 when there was no program in Missouri. It seems plausible to conclude that customer awareness on the Missouri side was at least in part raised by Ameren Illinois' previous four-year effort. This is especially true given the large population overlap in the greater St. Louis area which consists of 8 Illinois counties and 9 Missouri counties sharing mass media outlets.[44]

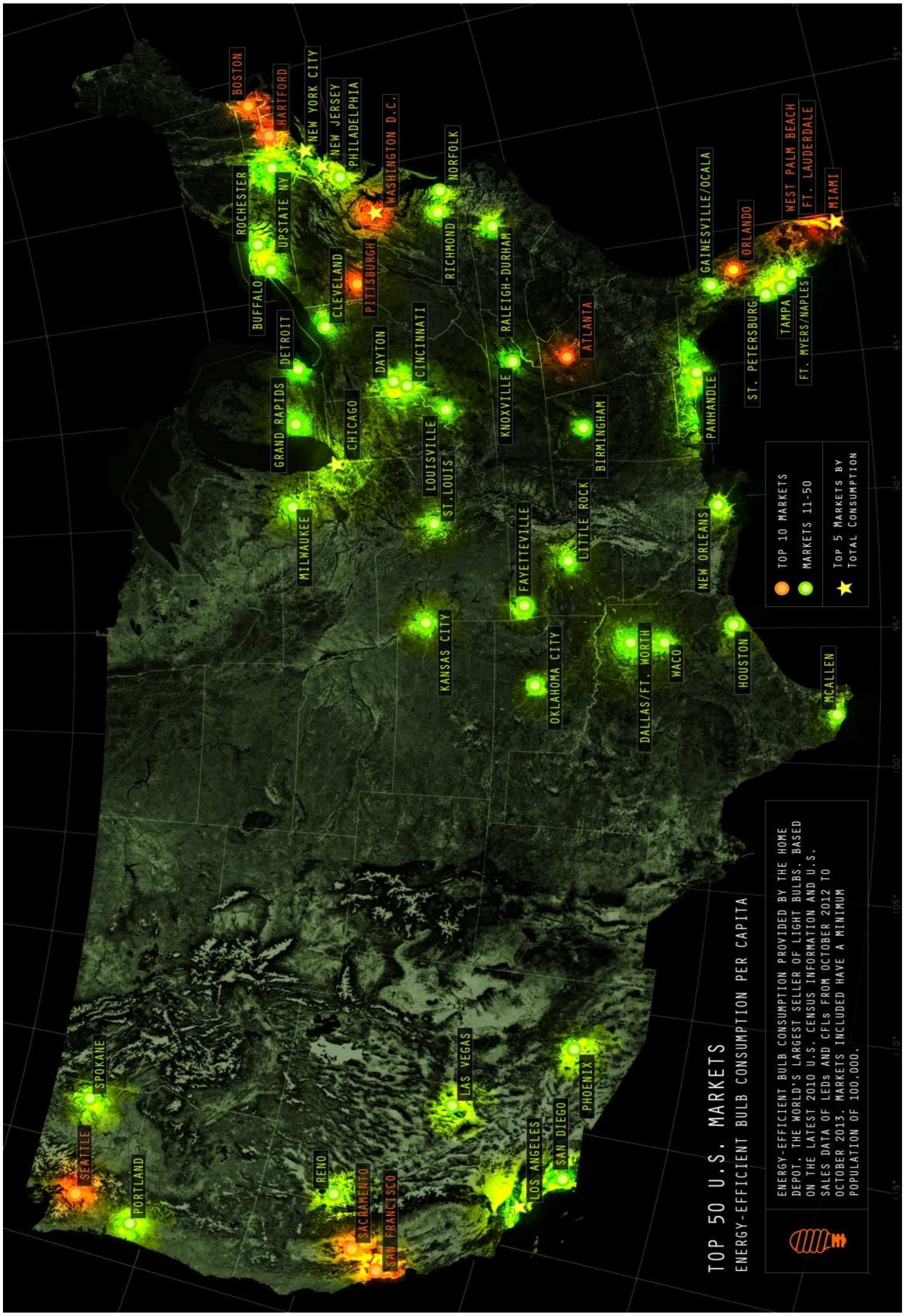
Home Depot and Kansas City

It is interesting to note that Home Depot issued a press release in the winter of 2013 to show the top 50 U.S. markets for energy efficient light bulbs based on consumption per capita from October 2012 to October 2013.[45] According to their data during this time, 27 of the top 50 markets offered lighting rebates. Two of those cities happen to be in Missouri. St. Louis, which benefits from both Ameren Missouri and Illinois having upstream lighting programs, is highlighted on the map. On the surface this would seem to indicate the program's success. However, when compared to Kansas City, Ameren Missouri's success is called into question.

[44] Greater St. Louis. http://en.wikipedia.org/wiki/Greater_St._Louis
[45] Fehrenbacher, K. (2013) Check out this map for which cities are buying LEDs & CFLs https://gigaom.com/2013/12/10/check-out-this-map-for-which-cities-are-buying-the-most-leds-cfls/

There was no upstream lighting program during that period in the Kansas City area on either the Missouri or Kansas side, and yet Kansas City adopted CFLs and LEDs with apparent vigor. The map below provides yet another piece of evidence to suggest that Ameren Missouri overstates the actual benefits the LightSavers program has produced.

Top 50 U.S. Markets for Energy Efficient Lighting:
Home Depot Sales Data Oct 2012 –Oct 2013



Q. Please summarize your main points regarding this section.

A.

Staff's request:

- Accept Auditor report without market effects, but if not, then
- Accept the Cadmus/ADM reports without market effects and
- Direct future evaluations to exclude market effects for PY2014 & PY2015

Staff's rationale:

- There are no accepted best practices for calculating market effects
- Evaluation should focus on benefits realized for activity in PY2013 not previous sunk costs for past EE programs or naturally occurring uptake

Public Counsel's comment:

- Support Staff's assertion to exclude market effects
- Accept Cadmus/ADM reports without market effects
- Future evaluations can contain market effects but parameters need to be addressed prior to evaluation

Public Counsel's rationale:

- Wal-Mart's influence on the retail market
  - Moved market in 2007 and impacted manufacturers
  - 2013 released market transformation LEDs (CFL market moved)
- California and previous utility-sponsored energy efficiency programs
  - 3-year program results in NTG of 0.53 between 2006 – 2008
- Energy Independence and Security Act of 2007
  - Moved manufactures to no longer make incandescent in U.S.
  - EE programs adjust gross estimates downward for CFLs to account for standards—seen in KCPL-MOs most recent MEEIA application
- Ameren Illinois's upstream lighting program
  - Close proximity and shared media suggest Illinois warrants credit for market effects on Missouri in 2012 when there was no program in place
- Home Depot and Kansas City
  - KC reaches top 50 status without an upstream rebate program in their territory in 2013
- Home energy audit marketed to potential home buyers
  - Provides a working example of a program design and market where over a period of time additional quantification of benefits for market effects would be justified

V. RESPONSE TO THE AMEREN MISSOURI AND STAFF NON-UNANIMOUS STIPULATION AND AGREEMENT

Q. What are the terms of Ameren Missouri and Staff's non-unanimous stipulation and agreement?

A. The parties settled on a "black box" calculation where the annual energy savings would be 369,500 MWh and the net benefits amount at $129,925,000.

Q. Please provide some context for those numbers. How do they differ from what was filed in each parties change request?

A. Table 10 provides a breakdown of the five net-to-gross ratios that have been submitted to date in this case for Ameren's PY2013.

Table 10: The five filed estimates to date

Source **(EO-2012-0142)**	**NTG**	MWh Saving	Difference	% 3yr-goal 793,100 MWh	Net benefits
Ameren[46]	116.1%	397,499	-	50%	$141,010,520
Cadmus [47]	114.5%	390,039	7,460	49%	$138,486,221
Black box[48]	107.4%	369,500	27,999	46.5%	$129,925,000
Auditor 2[49]	93.3%	322,296	75,203	40.6%	$113,272,046
Auditor 1[50]	89.7%	310,041	87,458	39%	$109,602,961

For reference purposes, I have also provided the original targets as submitted in Ameren Missouri's approved MEEIA application and seen in Table 11.

Table 11: Ameren Missouri's MEEIA Targets

[46] Application for Approval of Change Request (Ameren Missouri-Investor), 7/3/14.
[47] Revised Evaluation, Measurement and Verification (EM&V) Reports, 6/12/14.
[48] Non-Unanimous Stipulation and Agreement Settling the Program Year 2013 Change Request, 9/19/14.
[49] Final EM&V Auditor Report and Supporting Documentation, 8/27/14 with market effects.
[50] Final EM&V Auditor Report and Supporting Documentation, 8/27/14 without market effects.

	2013	2014	2015	Total
Energy Efficiency Savings (MWh)	**240,397**	255,445	297,260	793,102

As you can see from table 10:

- Ameren Missouri decreased their net-to-gross ratio by 8.7% and decreased their net shared benefits amount $11,085,520.
- Staff increased their net-to-gross ratio by 17.7% (no market effects and represented as Auditor 1) and increased their net shared benefits amount $20,322,039.

Additionally, the black box stipulation and agreement recognizes the use of market effects for future program years, which would suggest that PY2014 will receive similar treatments for the upstream lighting program.

Public Counsel believes the performance amount attributable to the black box non-unanimous stipulation and agreement for PY2013 would be calculated as follows:

6.19% of $20,322,039 = $1,257,934

That would be the performance incentive amount under the black box agreement and would assume that Ameren Missouri would reach their 130% target. This assumption is reasonable based on the fact that Ameren Missouri would already be at 46.5% their three-year target in their first year if the black box stipulation was agreed on. The numbers in the "black box" stipulation can be supported only if market effects are included in the agreement.

For numerous reasons stated above, Public Counsel believes that market effects within this context overstate the benefits accrued to ratepayers. Coming to a black box determination at some level slightly less than what Ameren has proposed does absolutely nothing to address the exaggeration of these benefits for this evaluation and for future program years. Additionally, the black box agreement does not address EM&V considerations moving forward and undermines the process currently in place by minimizing the evaluation and results of the Commission's independent auditor.

Ameren Missouri actually performed well during PY2013. Its results need no exaggeration, inflation or embellishment. This is illustrated by the results of both the evaluator and auditor reports minus the inclusion of market effects. Under our scenario, and as initially proposed by Staff, Ameren would have achieved 39% of their target goal in the first year leaving them only 31% away from being eligible for a performance incentive with two additional years to reach that.

VI. STATEMENT REGARDING THE CALCULATION OF NET SHARED BENEFITS

Q. What is your concern about the calculation of the net shared benefits.

A. The net shared benefits should not be calculated without an offsetting adjustment to reflect the performance incentive amount. Presently, that amount is not being calculated and is overstating the benefits attributable to the programs.

Q. Please explain.

A. The Total Resource Cost test is the preferred test in Missouri for the evaluation of the net shared benefits produced by energy efficiency programs. The Missouri Energy Efficiency Investment Act §393.1075.4 RSMo., states:

> The commission shall permit electric corporations to implement commission-approved demand-side programs pursuant to this section with a goal of achieving all cost-effective demand-side savings. Recovery for such programs shall not be permitted unless the programs are approved by the commission, result in energy or demand savings and are beneficial to all customers in the customer class in which the programs are proposed,

> regardless of whether the programs are utilized by all customers. **<u>The commission shall consider the total resource cost test a preferred cost-effectiveness test.</u>** Programs targeted to low-income customers or general education campaigns do not need to meet a cost-effectiveness test, so long as the commission determines that the program or campaign is in the public interest. Nothing herein shall preclude the approval of demand-side programs that do not meet the test if the costs of the program above the level determined to be cost-effective are funded by customers participating in the program or through a tax or other governmental credits or incentives specifically designed for that purpose (emphasis added).

The definition for net shared benefits in 4 CSR 240-20.093(1)(C) states:

> Annual net shared benefits means the utility's avoided costs measured and documented through evaluation, measurement, and verification (EM&V) reports for approved demand-side programs less the sum of the programs' costs including design, administration, delivery, end-use measures, **<u>incentives</u>**, EM&V, utility market potential studies, and technical resource manual on an annual basis (emphasis added).

The OPC recommendation to utilize the TRC is consistent with the MEEIA statute to deduct incentives from the net shared benefits calculation and is consistent with Chapter 20 rules. It also properly accounts for the very real costs that ratepayers will have to bear as a result of the utilities performance incentive. To exclude it would overstate the net shared benefits attributable to the energy efficiency program.

Public Counsel's Statement:

- Net shared benefits have not been properly calculated

Public Counsel's rationale:

- TRC test is preferred test and should be utilized for determining the annual net shared benefits
- "Incentives" should be deducted from the net shared benefits
    - This amount represents real costs borne by ratepayers

VII. CONCLUSION

Q. Could you please summarize Public Counsel's comments regarding the Change Requests?

A. The OPC recommends that the Commission reject Ameren Missouri's proposed downward adjustment of free ridership scores because they are unreasonable and result in an overestimation of net shared benefits.

The Commission should adopt Staff's Change Request that calls for the elimination of market effects in the formula used to calculate the LightSavers net-to-gross ratio. Additionally, the Cadmus/ADM spillover estimates should be utilized to calculate the overall net-to-gross ratio for the portfolio.

Public Counsel also recommends that the Commission order a recalculation of the the net shared benefits amount to reflect MEEIA statute §393.1075.4 RSMo. and the net shared benefits definition stated in 4 CSR 240-20.093(1)(C). An accurate and reasonable amount reflecting the utility's performance incentive should be deducted from the calculation of the net shared benefits, as it is ultimately a cost that ratepayers will have to pay.

Public Counsel does not believe that the black box settlement offer entered into by Ameren Missouri and Staff addresses the outstanding issues raised in this testimony, overstates realized energy savings and distorts the net shared benefit amount. Furthermore, the black box agreement does not address EM&V considerations moving forward and in this case undermines the process currently in place by minimizing the evaluation and results of the Commission's independent auditor.

Q. Does this conclude your testimony?

A. Yes, it does.

Attachment A

has been deemed

“Proprietary”

in its entirety.