Exhibit No.:	
Issues:	MEEIA 2016-2018
Witness:	Alex Schroeder
Sponsoring Party:	Missouri Department of Economic Development - Division of Energy
Type of Exhibit:	Rebuttal Testimony
Case No.:	EO-2015-0055

MISSOURI PUBLIC SERVICE COMMISSION

UNION ELECTRIC COMPANY

d/b/a

AMEREN MISSOURI

CASE NO. EO-2015-0055

REBUTTAL TESTIMONY

OF

ALEX SCHROEDER

ON

BEHALF OF

MISSOURI DEPARTMENT OF ECONOMIC DEVELOPMENT

DIVISION OF ENERGY

Jefferson City, Missouri
March 20th, 2015

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

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

AFFIDAVIT OF ALEX SCHROEDER

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Alex Schroeder, of lawful age, being duly sworn on his oath, deposes and states:

1. My name is Alex Schroeder. I work in the City of Jefferson, Missouri, and I am employed by the Missouri Department of Economic Development as a Planner III, Division of Energy.
2. Attached hereto and made a part hereof for all purposes is my Rebuttal Testimony on behalf of the Missouri Department of Economic Development – Division of Energy.
3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge.

Alex Schroeder

Subscribed and sworn to before me this 20th day of March, 2015

KAY A. JOHANNPETER NOTARY PUBLIC SEAL STATE OF MISSOURI

Notary Public

My commission expires:

KAY A. JOHANNPETER
Notary Public - Notary Seal
STATE OF MISSOURI
Cole County
My Commission Expires: Aug. 4, 2015
Commission # 11551967

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Alex Schroeder. My business address is 301 West High Street, Suite 720, PO Box 1766, Jefferson City, Missouri 65102.

Q. By whom and in what capacity are you employed?

A. I am employed by the Missouri Department of Economic Development - Division of Energy ("DE") as a Planner III - Senior Energy Policy Analyst.

Q. Please describe your educational background and employment experience.

A. In 2008 I graduated from the University of Evansville in Evansville, Indiana with a B.S. in business economics. In 2009 I obtained an M.A. in economics from Fordham University in New York City. And in 2014, I graduated from the University of Missouri - Columbia with a Ph.D. in agricultural economics.

I have been employed by DE since January, 2014. Prior to that, I was employed by the Manhattan Institute in Washington, D.C. as a research associate. During my doctoral studies, I was employed on a part-time basis by the Department of Personal Financial Planning and the Department of Agricultural and Applied Economics as a graduate assistant and a research assistant, respectively.

II. DE'S RESPONSE TO AMEREN MISSOURI'S MEEIA 2016-2018 FILING

Q. According to page 6 of Ameren Missouri's 2016-2018 Energy Efficiency Plan ("Plan"), its proposed 2016-2018 MEEIA portfolio is "based on RAP [Realistic Achievable Potential] levels of energy efficiency savings." What is DE's assessment of the RAP as outlined in Ameren's 2014 Integrated Resource Plan ("IRP")?

A. DE echoes Staff's concerns[1] about Ameren's potential underestimate of RAP. The relatively low RAP established in Ameren's IRP is brought into sharp relief when compared to the analogous figures from Kansas City Power & Light Company ("KCPL") and Kansas City Power & Light Company – Greater Missouri Operations ("GMO"). Slide 24 from Ameren's 7th technical conference on March 3rd contains a graph illustrating that Ameren's RAP is merely a fraction of KCPL's and GMO's RAP for much of the time period between 2016 and 2033.[2]

Q. On page 20 of its Plan, Ameren Missouri includes cost-effectiveness scores at both the program and portfolio levels. Do these figures raise any concerns for DE?

A. Yes. DE would like to emphasize that the MEEIA rules do not require the entire portfolio to meet a cost-effectiveness test, as low-income and educational programs are to be evaluated based on a "public interest" standard. Importantly, requiring the entire portfolio to meet a cost-effectiveness standard could function as a barrier to low-income and educational programs.

The MEEIA statute has to be given effect when it says, "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*".[3] Low-income and educational program approval is explicitly singled out as a "public interest" standard, not a cost-effectiveness standard. If these programs were factored in to the cost-effectiveness determination of the residential

[1] As outlined on page 15 of its report on Ameren's 2014 IRP
[2] In the MEEIA 2016-2018 technical conference on March 19th, Ameren Missouri did explicate some of the reasons their RAP differs so substantially from those of KCPL and GMO.
[3] RSMo., §393.1075.4. (http://www.moga.mo.gov/mostatutes/stathtml/39300010751.html). Italics added.

portfolio, that would severely undermine a key point of the cost-effectiveness exemption by requiring a *de facto* test of the cost-effectiveness of such programs.

Most importantly, lowering the TRC of a portfolio by including low-income and educational programs in an overall portfolio TRC calculation would pressure the Company to reduce or modify these programs' offerings to boost portfolio TRC; this would give undue decision-making weight to the cost-effectiveness of said programs. The clear standard for low-income and educational programs is thus rightfully the legislatively-dictated "public interest." Any requirement for cost-effectiveness at the portfolio level is inconsistent with the MEEIA statute and could lead to the marginalization of these programs.

Q. Ameren's proposed lighting program for its MEEIA Cycle 2 portfolio is projected to yield only 22% of the net incremental energy savings (61,507 MWh) achieved by its Cycle 1 lighting program (280,466 MWh). What is DE's perspective on this?

A. This reduction in Ameren's lighting program is the primary contributing factor to the considerable scaling down of its Residential portfolio as a whole (505,469 MWh of net incremental energy savings in Cycle 1 vs. 165,667 MWh in Cycle 2). The Company attributes this steep decline in projected energy savings to Energy Independence and Security Act (EISA) standards. The shift in the baseline in accordance with these standards will largely limit the lighting program to LED-related measures. According to page 67 of the Plan, "the residential lighting technologies to be offered for standard A base bulbs in 2016-18 are solely LED technologies. There are no standard A base CFLs, with the exception of high wattage bulbs, included in the MEEIA 2016-18 plan due to most CFLs no longer being cost effective."

DE agrees that shifting the baseline in accordance with evolving EISA standards limits the 2016-18 energy savings associated with the lighting program and can limit cost effective lighting measures to LEDs. However, treating the EISA standard as the baseline against which savings are to be measured is problematic. The EISA standard governs the import and manufacture of inefficient bulbs, but does not ban the sale or use of remaining bulbs that do not meet said standard.[4] Therefore, it says nothing about the kinds of bulbs that Ameren's customers are actually using, particularly in the aftermath immediately following the point at which it goes into effect. In other words, the EISA standard says nothing about the actual bulbs Ameren's customers would be replacing with rebated bulbs. It is more appropriately viewed as the standard against which energy savings should be measured in the *long-run*[5], rather than the short-run.

Q. Is the Company's position regarding the EISA standards internally consistent?

A. No. The Company actually acknowledges the point made above on page 83, chapter 8 of its 2014 IRP: "Current 2014 residential lighting program assumptions are that the halogen bulb which represents the [EISA] baseline energy consumption represents the MEEIA program baseline. The reality, however, is that *the baseline lighting technology should be represented by whatever lighting technology that has the highest market share.*"[6] Further down, on page 89, Ameren cites the EISA language in large, capitalized print, reminding readers that EISA's prohibitions pertain to *sales*, not *use*. The EISA standards and a

[4] LED Lighting Facts: A Program of the U.S. Department of Energy. "Frequently Asked Questions: Energy Independence and Security Act of 2007." (http://www.lightingfacts.com/library/content/faqs/eisa). Accessed March 12th, 2015.
[5] In the long-run, household socket saturation can "catch up" with the EISA standard. An exception to this would arise in contexts in which the EISA standard prohibited bulbs that had already naturally fallen out of favor with consumers.
[6] Ameren Missouri, "2014 Integrated Resource Plan: Chapter 8 - Demand-Side Resources", October 1st, 2015. Italics added.

realistic baseline are not necessarily one and the same, as there is not necessarily a direct relation between the EISA standard at any given moment and the actual bulbs people use in the short run.

The National Renewable Energy Laboratory (NREL) recommends that "in cases where actual pre-program measure wattage is not available, [evaluators should] continue to adopt the EISA standards as the new baseline." However, NREL offers the following qualification:

> [P]rogram administrators who have adequate resources should conduct ongoing monitoring and research to determine whether the delta watts assumptions reflect *actual market conditions* during the phase-in of the EISA requirements and use a lagged approach to phasing in the requirements. For example, after conducting shelf stocking studies for several Massachusetts program administrators, evaluators implemented a time-dependent, shifting baseline.[7]

A baseline standard that is not representative of reality[8] can lead to a) an underestimate of projected energy savings, and b) the exclusion of cost-effective measures that are in reality cost effective (i.e., CFLs in the present context). We know that in even the most progressive states, CFL socket saturation tops out at around 40%.[9] This certainly raises questions about the prudence of ceasing rebates for CFLs.

[7] National Renewable Energy Laboratory, "Chapter 6: Residential Lighting Evaluation Protocol. The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures", February 2014. Subcontract Report authored by Scott Dimetrosky, Katie Parkinson, and Noah Lieb. (http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=3&cad=rja&uact=8&ved=0CCwQFjAC&url=http%3A%2F%2Fwww.nrel.gov%2Fextranet%2Fump%2Fpdfs%2F20140514_ump_res_lighting_draft.pdf&ei=BPoCVeqBCYOkyQTvlYHICw&usg=AFQjCNGPSbZWF1OZcGvoS6UjohTtpbRvTg&sig2=vp6PWKuI_igfUaDkgTtnnA). Accessed March 13th, 2015. (Quotations from pages 6-14 – 6-15). Italics added.

[8] I.e., a standard that assumes a given technology has significantly penetrated the market, when in reality a less sophisticated technology prevails in said market.

[9] American Council for an Energy-Efficient Economy, "Expanding the Energy Efficiency Pie: Serving More Customers, Saving More Energy Through High Program Participation", January 2015. Report authored by Dan York, Max Neubauer, Seth Nowak, and Maggie Molina. (http://aceee.org/research-report/u1501). Accessed March 13th, 2015. For example, in Massachusetts this figure is 40%. In New York this figure is 25%.

Q. Would you agree that providing rebates for CFLs is inappropriate given that less efficient light bulbs may no longer be manufactured?

A. No. This line of thinking sees little point in providing rebates for bulbs that represent the so-called "efficiency floor," despite two flaws in the logic of the argument. The first is that, as mentioned above, EISA does not prohibit the continued sales of remaining inventories of bulbs that do not meet current standards. This means that there remain alternative options for customers in the short-run, and rebates can help incent customers to purchase a CFL over a less efficient bulb. But we can go one step further. Even if we assume that CFLs are the least efficient option available (i.e., inventories of less efficient bulbs have been sold off), rebates can still play an important role in accelerating the diffusion of CFLs in Ameren's service territory. Rebates lower the price a consumer faces in the market, which may very well incent her to purchase more CFLs than she otherwise would. If those CFLs subsequently replace less efficient bulbs (e.g., incandescents), significant energy savings would occur, savings that would not be accounted for if CFLs were the baseline. When determining when and to what extent to end rebates for CFLs (or any other bulb), therefore, household usage patterns are a more relevant metric than EISA standards.

DE would welcome further inquiry into the appropriate baseline against which to measure savings from the lighting program. Given the importance of the lighting program - both in absolute terms and relative to the other programs in the residential portfolio - the savings associated with Ameren's MEEIA Cycle 2 portfolio will to a significant extent be a function of this baseline.

Q. In the fourth technical conference that Ameren held with stakeholders on February 4th, the Company suggested that CHP is a potential MEEIA program, but that its inclusion may require a statutory or regulatory change. What is DE's response?

A. While DE was pleased to see CHP included in MEEIA discussions, we do not believe that integrating it into a MEEIA portfolio would require a statutory or regulatory change. Sections 393.1075.2(4) RSMo, 4 CSR 240-3.163(1)(N), 4 CSR 240-3.164(1)(K), 4 CSR 240-20.093(1)(U), and 4 CSR 240-20.094(1)(Q) all define energy efficiency as "… measures that reduce the amount of electricity required to achieve a given end-use." CHP systems offer energy efficiency savings; they can achieve efficiencies of 60 to 80 percent, compared to just 45 percent efficiency from separate heat and power.[10] In its original comments on the ongoing MEEIA rule revision workshop, DE explained that the MEEIA statute and rules enable CHP to count towards MEEIA on a kWh or kWh-equivalent basis.[11] As indicated by questioning from Renew Missouri and DE, CHP was widely accepted by stakeholders as acceptable under MEEIA; even KCPL indicated that there was no need for rule revision.

In addition to these energy efficiency gains, CHP also fits into MEEIA under the broader definitions of "demand-side program" in § 393.1075.2(3) RSMo, 4 CSR 240-3.163(1)(E), 4 CSR 240-3.164(1)(F), 4 CSR 240-20.093(1)(L), and 4 CSR 240-20.094(1)(I). In

[10] Missouri Public Service Commission Case No. ER-2014-0258, *In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its Revenues for Electric Service*, Direct Testimony of Alex Schroeder on Behalf of Missouri Department of Economic Development, Division of Energy. December 19, 2014. (https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935896250). Accessed March 13th, 2015.

[11] Missouri Public Service Commission Case No. EW-2015-0105, *In the Matter of a Working Case to Review The Commission's Missouri Energy Efficiency Investment Act (MEEIA) Rules 4 CSR 240-3.161, 4 CSR 240-3.164, 4 CSR 240-20.093, and 4 CSR 240-20.094*, Missouri Division of Energy's Comments Regarding the MEEIA Rule. November 14th, 2014. (https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935887229). Accessed March 20th, 2015.

general, these definitions provide that a demand-side program is, " … *any program* conducted by the utility to *modify the net consumption of electricity on the retail customer's side of the meter* including, but *not limited to*, energy efficiency measures, load management, demand response, and interruptible or curtailable load."[12] The broadly enabling words "any program" and "including, but not limited to" provide sufficient flexibility to include CHP. Any applicable program must only "modify the net consumption of electricity on the retail customer's side of the meter," but the applicable language does not mandate a decrease in electricity consumption over a specified period of time. CHP, like load management and interruptible or curtailable load programs, allows for peak shaving and load shifting to off-peak periods, reducing the need for additional generation and transmission infrastructure to meet peaking requirements. While DE does not believe that any additional rulemaking is necessary in this instance, the Commission should clarify that CHP is an eligible demand-side measure.

Q. On the 25th slide from the presentation given in Ameren's 5th MEEIA Cycle 2 technical conference, the Company asserts that CHP, among other supply-side resources, "currently do[es] not meet the TRC>1.0 requirement." What is DE's response?

A. Ameren's 2014 Demand-Side Management Market Potential Study included "in-depth case studies of DG-CHP applications for two Ameren customers: a major corn milling facility and a major manufacturing facility." *In both cases, the analysis found CHP to be cost-effective,* albeit marginally. The TRC values of the applications were 1.17 and 1.04, respectively.

[12] Italics added

More importantly, Ameren's conclusion that CHP is limited in its cost-effectiveness is a function in part of the Company's Rider E: "An additional factor to consider is the customer's Ameren Missouri [sic] rate structure, which contains a standby charge (Rider E) for Ameren to maintain the necessary capacity if the customer would choose to revert to grid power in the event of an emergency shutdown of their DG-CHP system."[13] But treating Rider E as an exogenous given is problematic; in fact, on March 19th, 2015 the Commission approved a *de jure* unanimous stipulation and agreement that will lead to a revised Rider E.[14] Thus, before drawing any substantive conclusions about the cost effectiveness of CHP in its service territory, the Company should consider how a revised supplementary service rider would impact CHP potential. Including variations of the terms of standby service would have made for a more meaningful potential study, thereby improving the Company's MEEIA Cycle 2 filing.

Q. The joint delivery of programs with Laclede or Ameren Gas was an issue brought up in the previous MEEIA case (EO-2012-0142). Is joint delivery still something that should be explored?

A. Absolutely. There would be a number of benefits associated with joint delivery. Joint delivery allows for the sharing of fixed costs and the harnessing of economies of scale,

[13] The two quotes in this answer are taken from: Enernoc Utility Solutions, "Demand-Side Management Market Potential Study, Volume 5: Distributed Generation Analysis." Study prepared for Ameren Missouri and presented on December 20th, 2013. (https://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=3&ved=0CCYQFjAC&url=https%3A%2F%2Fwww.ameren.com%2F-%2Fmedia%2FMissouri-Site%2FFiles%2Fenvironment%2Frenewables%2Firp%2Firp-chapter8-appendixb-vol5.pdf%3Fla%3Den&ei=PQIHVYW_CreJsQTj74CQCg&usg=AFQjCNFtYADobUAkljc5cHOlkjzpWJbG7Q&sig2=BUJz3lwfYfYx4qEsdOAFbQ&bvm=bv.88198703,d.cGU). Accessed March 16th, 2015. Pages 3-1 - 3-2.

[14] Missouri Public Service Commission Case No. ER-2014-0258, In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its Revenues for Electric Service, Order Approving Stipulation and Agreement Regarding Supplemental Service Issues. March 19th, 2015. (https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935917009). Accessed March 20th, 2015.

which in turn could effect greater efficiency in program delivery. In his rebuttal testimony in the previous MEEIA case, Laclede witness James Travis[15] highlighted a few examples of particular programs that would lend themselves to joint delivery. This is an idea that should be explored by parties to the present MEEIA case in greater detail. Gas and electric efficiency measures often share common ground in terms of costs and benefits. Despite Ameren's assertion in its 8th technical conference on March 19th that gas savings should not count towards cost effectiveness savings, this practice is accepted by KCPL in its potential study. It simply does not make sense to abstain from exploiting this common ground, which would help maximize the efficiency and cost-effectiveness of program delivery.

Q. Does DE have any concerns pertaining to Ameren's low-income program(s)?

A. To pivot off the comments provided by the National Housing trust, DE would like to emphasize the tremendous savings potential that exists in Missouri for multifamily housing. A recent White Paper sums up the situation in Ameren's Missouri and Illinois service territories:

> In total, there are 224,569 households in affordable multifamily[16] buildings in the Ameren Illinois and Ameren Missouri service territories. Of these homes, 70,175, or 31 percent, are participating in an energy efficiency program, but of those participating, 68,775, or 98 percent, are benefitting largely from direct install measures, see Appendix. Comprehensive or whole-building efficiency programs for multifamily buildings are very limited across these service territories in both states, and multifamily buildings do not currently have access to any targeted

[15] Missouri Public Service Commission Case No. E0-2012-0142, 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, Rebuttal Testimony of James Travis on Behalf of Laclede Gas Company. April 13th, 2012. (https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935684340). Accessed March 17th, 2015.

[16] "Multifamily" is defined in the referenced White Paper as buildings of five or more units.

> one-stop programs. Energy savings of up to 30 percent are achievable in multifamily buildings.[17]

In Ameren Missouri territory specifically, there are 94,381 households in affordable multifamily buildings, of which 29,500 are participating in an energy efficiency program (note that 100% of these 29,500 are benefitting from direct install measures).[18] In light of this untapped potential, it is prudent to explore solutions beyond direct install measures in multifamily units. It is essential that the design and delivery of any program targeted to multifamily housing units should be grounded in an understanding of how said units differ from their single family analogs. Further, Ameren should ensure that it is targeting unsubsidized low-income housing, in addition to the subsidized units that are more typically associated with notions of low-income housing. The White Paper referenced above contains a number of recommendations for how to effectively harness the potential inherent in multifamily housing to effect energy and demand savings, as well as a number of non-energy benefits.

Q. Does this conclude your rebuttal testimony?

A. Yes.

[17] "Scaling Up Energy Efficiency in Missouri and Illinois Multifamily Affordable Housing." Collaborative White Paper produced by the 2014 St. Louis Metropolitan Area "Dialogue on Improving Energy Efficiency for Affordable Multifamily Housing." March, 2015. Hosted by the National Housing Trust and the Natural Resources Defense Council. (Paper is attached as Appendix A). (Quotation from pages 2-3).
[18] Ibid.