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Witness:	Hojong Kang
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MISSOURI PUBLIC SERVICE COMMISSION

REGULATORY REVIEW DIVISION

REBUTTAL TESTIMONY

OF

HOJONG KANG

UNION ELECTRIC COMPANY d/b/a AMEREN MISSOURI

FILE NO. EO-2012-0142

Jefferson City, Missouri
April 2012

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 Furtherance of Energy Efficiency as allowed by MEEIA	)))))	File No. EO-2012-0142

AFFIDAVIT OF HOJONG KANG

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

Hojong Kang, of lawful age, on his oath states: that he has participated in the preparation of the following Rebuttal Testimony in question and answer form, consisting of 21 pages of Rebuttal Testimony to be presented in the above case, that the answers in the following Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Hojong Kang

Subscribed and sworn to before me this 13th day of April, 2012.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 03, 2014
Commission Number: 10942086

Notary Public

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REBUTTAL TESTIMONY

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UNION ELECTRIC COMPANY d/b/a AMEREN MISSOURI

FILE NO. EO-2012-0142

Q. Please state your name and business address.

A. My name is Hojong Kang, and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

Q. What is your present position at the Missouri Public Service Commission?

A. I am a Regulatory Economist in the Resource Analysis Section of the Energy Unit, in the Regulatory Review Division.

Q. Please state your educational background and experience.

A. I received a PhD degree in Economics from the University of Missouri, Columbia in 2005, a Master of Business Administration degree from California State University at East Bay in 1996 and a Bachelor of Science degree in Business Administration from Hong-Ik University, Korea in 1991. I have worked as a Regulatory Economist in the Resource Analysis Section of the Missouri Public Service Commission ("Commission") since I began my employment with the Commission in 2010. In my position as a Regulatory Economist for the Commission Staff ("Staff"), I review the resource plan filings and the general rate increase filings of investor-owned electric utilities. I have contributed to the Staff reports in Chapter 22 compliance filing cases regarding demand-side analysis[1]. I have

[1] EO-2011-0066 for the Empire District Electric Company ("Empire") and EO-2011-0271 for Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri").

contributed to the Staff's direct testimony for rate design and class cost-of-service reports in the last general electric rate cases of all of investor-owned electric utilities[2] and filed surrebuttal testimony in Case No. ER-2011-0028 to present and support Staff's recommendations that the electric utilities initiate LED street lighting programs. Schedule HK-1 contains a list of the conferences and seminars I have attended regarding LED street lighting and demand-side analysis.

I also attended the Commission's Missouri Energy Efficiency Investment Act of 2009 ("MEEIA") rulemaking workshops held in April through June, 2010. I recently filed rebuttal testimony in Case No. EO-2012-0009 to present Staff's recommendations related to the KCP&L Greater Missouri Operations Company's ("GMO's") proposed demand-side management programs.

Q. Would you please summarize the purpose of your rebuttal testimony?

A. I address the sections of Union Electric Company d/b/a Ameren Missouri's ("Ameren Missouri" or "Company") *2013 – 2015 Energy Efficiency Plan* ("Company's Report") regarding the Company's calculation of the Total Resource Cost test ("TRC") for all of Ameren Missouri's proposed demand-side management ("DSM") programs. I also include Staff's review, analysis and recommendations concerning the Company's proposed DSM programs with respect to the minimum filing requirements contained in Rules 4 CSR 240-20.094(3) and 4 CSR 240-3.164(2).

As a result of its review, Staff finds that the gross energy and demand savings levels and avoided cost estimates Ameren Missouri has provided for its DSM programs and spending levels are reasonable based on the program descriptions in Appendix B of the

[2] ER-2010-0355 for Kansas City Power & Light Company ("KCPL"), ER-2010-0356 for KCP&L Greater Missouri Operations Company ("GMO"), ER-2011-0004 for Empire, and ER-2011-0028 for Ameren Missouri.

Company's report of its proposed DSM programs. I present Staff's following recommendations related to Company's proposed DSM programs:

1. That the Commission order Ameren Missouri to calculate and file in this case the TRC for its Residential Refrigerator Recycling and Residential Home Energy Performance programs consistent with the definition of the TRC in Rule 4 CSR 240-3.164(1)(X);
2. That the Commission approve the general demand-side program designs as outlined in its filing;
3. That the Commission order Ameren Missouri to verify gross savings and net savings through the evaluation, measurement and valuation (EM&V);
4. That the Commission not approve Ameren Missouri's TRM until after Staff has the opportunity to review the revisions contained in the rebuttal testimony of DNR and provide its views on them to the Commission; and
5. That the Commission find that the Company's proposed annual energy and demand savings levels are reasonable given the programs' designs and planned spending levels.

Review of Demand-Side Programs

Q. Has Staff identified any differences between Ameren Missouri's previously implemented DSM programs and the DSM programs the Company is proposing the Commission approve under the MEEIA here?

A. No, Staff is not able to identify if there are any differences between Ameren Missouri's previous DSM programs and the newly proposed programs because Ameren Missouri didn't file proposed tariff sheets for each proposed program. However, some of the programs appear to be similar to the programs implemented before September 2011. In addition to programs similar to what Ameren Missouri previously implemented, Ameren Missouri is proposing three new programs: Residential Energy Efficient Products, Residential Home Energy Performance, and Residential Energy Star® New Homes.

Q. Would you describe the Ameren Missouri DSM programs that you reviewed for this case?

A. I reviewed the seven (7) residential energy efficiency ("EE") programs and four (4) business EE programs that Ameren Missouri is requesting the Commission approve. A brief description of each follows.

1. Residential Energy Efficiency Programs

a. Residential Lighting Program

The Residential Lighting program is designed to increase sales and awareness of ENERGY STAR® qualified lighting products. The program would be targeted to local and national lighting retailers; such as, Family Dollar, Dollar Tree, Schnucks, Home Depot, Lowe's, Sam's Club, and Costco. The program would be run through a third-party implementer and its subcontractors with significant experience in markdown and rebate processing, and in working with national and local retail outlets. Incentives may be offered to retail partners to increase sales of qualified lighting. Through these incentives, the end-user receives a discount on the price of highly efficient, ENERGY STAR or better, qualified lighting products. This program is available to anyone who purchases a lighting product at the targeted local and national lighting retailers, regardless of where they get their electricity. This means they could get their electricity from Ameren Missouri, a rural electric cooperative, a city municipal utility, another investor-owned electric utility, or they might generate their own electricity.

b. Residential Energy Efficient Products

The objective of the Residential Energy Efficient Products Program is to raise customer awareness of the benefits of "high-efficiency" products, e.g., Energy

Star, Consortium for Energy Efficiency (CEE) Tiers, or more efficient products. Ameren Missouri intends for this program to be an umbrella program, incorporating various program partners, products, and program delivery strategies. Many of the measures will be incentivized via mail-in rebates, while others may be packaged together and delivered through program allies and contractors. To the extent possible, Ameren Missouri states it would attempt to leverage opportunities with both federal and state programs. This program would be offered to all residential customers within the Ameren Missouri service territory.

c. Residential Heating, Ventilation, and Air Conditioning (HVAC)

The Residential HVAC program is intended to obtain energy and demand savings through improvement in the operating performance of existing residential cooling units or replacement of central Air Conditioning (AC) units and heat pumps. This program would cover most aspects of air conditioners and heat pumps including commissioning and retro-commissioning, rated unit efficiency, actual unit efficiency, duct system efficiency, retrofit and replacement upgrades. This program would also provide new marketing concepts that, if successful, may be used for other programs in the Company's service area. This program would be offered to Residential customers with central air conditioning units or heat pumps.

d. Residential Refrigerator Recycling

The Residential Refrigerator Recycling program is designed to promote the retirement and recycling of inefficient refrigerators and freezers from households by offering a turn-in incentive and free pick-up of working equipment, as well as information and education on the cost of keeping an inefficient unit in operation.

The Company would contract with an appliance recycling contractor to provide turnkey implementation services that include verification of customer eligibility, scheduling of pick-up appointments, appliance pick-up, recycling and disposal activities, and incentive processing. Recycling/disposal practices would be designed to prevent the release of chlorofluorocarbons (CFCs). In addition to free pick-up of eligible equipment, the program would provide turn-in incentives.

This program would be offered to Residential customers with working refrigerators and freezers manufactured in or before 2001.

e. Residential Home Energy Performance (HEP)

The Residential HEP's objective is to educate residential customers about energy use in their homes and to offer information, products, and services to residential customers to save energy cost-effectively. HEP would be an energy efficiency program focused on a whole-house approach. A third-party implementer would market various services, including energy audits, air sealing, insulation, and highlight free direct-install measures such as CFLs, faucet aerators, and low flow shower heads. This program would be offered to all existing single-family residential homes in the Ameren Missouri service territory.

f. Residential Energy Star® New Homes

The Residential Energy Star® New Homes program is designed to increase consumer awareness of and demand for newly constructed ENERGY STAR version 3.0 single-family homes, while increasing the building industry's willingness and ability to construct ENERGY STAR homes. The program would target builders with a package of training, technical and marketing assistance, and

incentives for construction of ENERGY STAR homes. It would include measures targeting the new home's envelope (e.g., outer walls, windows, doors, skylights, roof and insulation), HVAC system, ductwork, lighting and appliances. This program would be offered to residential customers in the new homes market in the Ameren Missouri service territory.

g. Residential Low Income

The objective of this program is to deliver long-term energy savings and bill reductions to low-income residential customers. This would be achieved through education and a variety of cost-effective measures, including direct installation measures. For this program, low-income is defined as below 200% of the federal poverty level. This definition is subject to change depending on funding and federal requirements. The target market is multifamily building owners, managers, operators, and developers of properties with dwelling units of three (3) or more in buildings participating in one or more of the federally subsidized housing programs: HUD[3], USDA[4] and Public Housing. The low-income tenants are the direct beneficiaries of the direct installed measures. As the program matures, there may be a possibility of broadening the target market to include duplex and single family, low-income rental homes with the same qualifications. The program would be run through a contractor or by the Company. Staff has issued data requests to clarify how this will be different from Ameren Missouri's current low-income weatherization program.

[3] U.S. Department of Housing and Urban Development
[4] U.S. Department of Agriculture

2. Business Energy Efficiency Programs

a. Business Standard Incentive Program

The Business Standard Incentive program is designed to promote the installation of energy efficient technologies including lighting, HVAC, and refrigeration in nonresidential properties. This program would incentivize customers to purchase and install energy efficient products. Measures included within this program would have predetermined savings values and fixed incentive levels associated with them, although these incentive values may change as program budget and performances change throughout the year. This program would be offered to commercial and industrial customers.

b. Business Custom Incentive Program

The objective of the Business Custom Incentive program is to provide energy efficiency expertise, services, and financial incentives to encourage business customers to install energy efficient equipment that lies outside standard lighting, HVAC, motors, refrigeration, and other equipment that do not fall into the Business Standard Incentive program.

Financial incentives would be provided to offset the higher costs associated with installation of new, higher efficiency equipment retrofits, process improvements, or building system upgrades. This program would be offered to commercial and industrial customers.

c. Business Retro-commissioning Incentive Program

The Business Retro-commissioning Incentive program is designed to deliver energy and demand savings by helping building owners benchmark existing building performance levels, identify building operating system performance

optimization improvements, and where applicable, provide financial incentives to assist with the implementation of the recommended efficiency improvements. The program would seek to identify efficiency opportunities associated with existing mechanical, electrical and thermal systems in nonresidential buildings by providing options for modifying existing controls. This program would be offered to commercial and industrial customers.

d. Business New Construction Program

The primary goal of the Business New Construction program is to capture energy savings available in new building construction, major renovations, or tenant build-outs in business facilities.

The purpose of this program would be to encourage energy efficient building practices for commercial and industrial new construction within the Ameren Missouri service territory. There are several market barriers to overcome, including energy-efficiency measures in commercial and industrial buildings, high first cost of the measures, lack of building construction activity, and market adoption of these high-efficiency building design and general construction practices. This program would be offered to commercial and industrial customers constructing a new building, major tenant build-outs, or renovation of commercial and industrial buildings in the planning and design phase.

Q. Does Ameren Missouri intend to implement these programs you just described?

A. Not necessarily. On page 62 of the Company's Report, it states:

> While the program templates in Appendix B provide a good description of proposed programs, implementation contractors will have significant

influence in final program design. Hiring of these contractors will not occur until MEEIA approval and, therefore, the Company cannot provide final program details with this filing. Broad flexibility with regard to implementation but strict adherence to energy savings commitments and benefit sharing methodology will allow the Company to implement with less risk of regulatory delay over tariffs while still being held accountable for aggressive MWh acquisition.

Calculation of the Total Resource Cost Test

Q. Did Ameren Missouri properly calculate the TRCs for each of the programs?

A. No, Ameren Missouri improperly calculated the TRC for the Residential Refrigerator Recycling program.

Q. What is improper about how Ameren Missouri calculated that TRC?

A. In Rule 4 CSR 240-3.164(1)(X), TRC is defined as:

Total resource cost test, or TRC, means the test of the cost-effectiveness of demand-side programs that compares the avoided utility costs to the sum of all incremental costs of end-use measures that are implemented due to the program (including both utility and participant contributions), plus utility costs to administer, deliver, and evaluate each demand-side program.

Total costs in the TRC calculation can be expressed as[5]:

Total Costs (***TC***) = All Utility Costs (***UC***) + Participant Contributions (***PC***)

where:

UC: The ***Sum*** of Administration Costs, Implementation Costs, Utility Incentive Payments, and Other Costs including EM&V.

PC: Gross Expense ***minus*** Utility Incentive Payments.

This can be rewritten as:

[5] The California Standard Practice Manual (2002). In this manual, the formula is expressed with the net present values.

Total Costs (***TC***) = [Administration Costs + Implementation Costs + Utility Incentive Payments + Other Costs including EM&V] + [Gross Expense – Utility Incentive Payments]

In this formula, the utility incentive payments are canceled out, because utility incentive payments are a positive cost to the utility and a negative cost to the participant. It signifies no change in total resources in the service territory because the incentive dollars paid by the utility remain within the service area and are considered an economic transfer payment from the utility to the DSM program participants. Therefore, the payment of an incentive in a demand-side program does not affect the total resources in the service territory or the TRC calculation.

However, the Company included the incentive payments as an implementation or participant cost when it evaluated its Residential Refrigerator Recycling program using the DSMore™ computer software[6]. Even though Ameren Missouri describes the incentive payment of the Residential Refrigerator Recycling program on line 7 – 8 at p.12 of Company's Report and at pp.12 – 14 of Appendix B, the Company explained its TRC calculation in its response to Staff's Data Request No. 0026 as follows

> 1) The label of "incentive" within the table that you are referring to is really a program cost that is designed to induce participation within the program, and is treated as a program cost

As the Company described above, Ameren Missouri treated the "incentive" payment as a program cost within the cost effectiveness analysis. This is inconsistent with the definition in Rule 4 CSR 240-3.164(1)(X) and the generally accepted method for calculating

[6] Demand Side Management Option Risk Evaluator (DSMore™) is a financial analysis tool designed to evaluate the costs, benefits, and risks of DSM programs and services. DSMore™ provides cost effectiveness test results, including UCT, Total Resource Cost Test, Ratepayer Impact Measure Test, and Societal Test. Currently, Ameren Missouri, KCPL and GMO are using this program to evaluate DSM programs.

the TRC. Instead, it is consistent with calculating the utility cost test ("UCT"). The Company should not treat the "incentive" payment as a program cost for the TRC calculation. However, it is an "incentive" payment to a customer that is designed to incent (or induce) participation of a customer within the program. And, therefore, it is consistent with calculation of the TRC.

Q. What is the difference between the UCT and the TRC?

A. The UCT, also called the Program Administrator Cost Test ("PACT"), measures the net costs of a program as a resource option, based on the costs the program administrator incurs, *including incentive costs*, and excluding any net costs the program participants incur. The UCT benefits are similar to the TRC benefits.[7] However, the TRC includes the net participant cost, but the UCT does not.

Q. Did the Company re-calculate the TRC for the Residential Refrigerator Recycling program?

A. Yes, in response to Staff Data Request No. 0026, Ameren Missouri re-calculated the TRC for the Residential Refrigerator Recycling program. The TRC of this program changed to 4.13 from 2.93 when the incentive payment is properly treated. In Table 1 of the Company's response to Data Request No. 0026, the TRC and the UCT have the same test score, 2.93, because the Company treated the incentive payment as a program cost in both tests.

Q. Does Staff have another concern regarding Ameren Missouri's cost-effectiveness analysis?

[7] The California Standard Practice Manual (2002), p.23.

A. Yes. Ameren Missouri included the gas savings, Avoided Gas Production and Avoided Gas Capacity, in its cost-effective analysis for the Residential Home Energy Performance program.

Q. Would you explain why the gas savings should not be included in its cost-effectiveness analysis?

A. By the definition of the TRC in Rule 4 CSR 240-3.164(1)(X), the benefit of a DSM program comes from the sum of avoided "utility" costs. The programs Ameren Missouri filed are those of an electric utility, not a gas utility. Therefore, the Company should not include $1,491,270 of the avoided gas production and $64,789 of the avoided gas capacity for its cost-effective analysis for the Residential Home Energy Performance program.

Q. Did Ameren Missouri use the correct method to calculate the TRC for its other demand-side programs?

A. Yes.

Q. Does Staff have a recommendation for the Commission regarding the calculation of the TRCs for Ameren Missouri's demand-side programs?

A. Yes. Staff recommends that the Commission order Ameren Missouri to calculate and file in this case the TRC for its Residential Refrigerator Recycling and Residential Home Energy Performance programs consistent with the definition in Rule 4 CSR 240-3.164(1)(X).

Programs' Estimated Cost-Effectiveness Tests

Q. Would you summarize the estimated cost-effectiveness test results for each Company proposed program?

A. Yes. Table 1 summarizes the results of each cost-effectiveness test for Ameren Missouri's proposed DSM programs.

<Table 1>
Cost-Effectiveness Test Summary

Programs	TRC	UCT	RIM[8]
RES-Lighting	3.66	6.01	0.56
RES-Efficient Products	1.55	3.90	0.62
RES-HVAC	2.11	4.61	0.94
RES-Refrigerator Recycling	4.13[9]	2.93	0.63
RES-Home Energy Performance	1.64	3.00	0.68
RES-Energy Star® New Home	1.26	1.77	0.57
RES-Low Income	0.84	0.84	0.46
RES-Total	**2.24**	**4.00**	**0.68**
BUS-Standard	2.14	3.15	0.75
BUS-Custom	1.77	3.55	0.82
BUS-Retro-Commissioning	1.70	3.77	0.79
BUS-New Construction	1.36	2.22	0.71
BUS-Total	**1.85**	**3.33**	**0.79**
Portfolio Total	**2.07**	**3.71**	**0.72**

Q. Would you summarize benefits and costs Ameren Missouri reports for each cost-effectiveness test for each program?

A. Table 2 summarizes the components in each cost-effectiveness test.

[8] RIM stands for a Ratepayer Impact Measure test.
[9] This value is recalculated with Staff's Date Request No.0026.

<Table 2>
Summary of Benefits & Costs Included in Each Cost-Effectiveness Test[10]

Component	TRC	UCT	RIM
Energy- & capacity-related avoided costs	Benefit	Benefit	Benefit
Additional resource savings	Benefit		
Non-monetized benefits			
Incremental equipment & installation costs	Cost		
Program overhead costs	Cost	Cost	Cost
Incentive payment		Cost	Cost
Bill savings			Cost

Q. Do you recommend the Commission approve Ameren Missouri's proposed DSM programs?

A. As Table 1 illustrates, most of the programs have a TRC test ratio greater than one (1.0). A TRC greater than one means that the program is cost-effective. The Residential Low Income program has a TRC lower than one (1.0), but this program helps low-income customers reduce their energy usage and energy bills, and low-income programs are not required by the MEEIA to have a TRC greater than 1.0. Therefore, Staff recommends that the Commission approve the general demand-side program designs as outlined in its filing.

However, as previously discussed the programs outlined in the Company's Report may be different from the programs it actually implements. Staff witness Michelle Bocklage describes in her testimony the reason why tariff sheets are necessary and what the tariff sheets should contain.

Net Savings versus Gross Savings

Q. Would you explain the Net-To-Gross ratio?

[10] National Action Plan for Energy Efficiency (2008). *Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers*. Energy and Environmental Economics, Inc. and Regulatory Assistance Project. <www.epa.gov/eeactionplan>

A. The Net-To-Gross ratio, or NTG ratio, is the ratio of net program savings to gross program savings. The 2008 National Action Plan for Energy Efficiency ("NAPEE") guide states, "Establishing the NTG is critical to understanding overall program success and identifying ways to improve program performance" (p. 4-9).

Q. How are NTG ratios determined?

A. The 2008 NAPEE on pages 4-9 and 4-10 introduces six key factors to estimate NTG ratios for DSM programs. They follow:

• ***Free riders.*** A number of customers take advantage of rebates or cost savings available through conservation programs even though they would have installed the efficient equipment on their own. Such customers are commonly referred to as "free riders."

• ***Installation rate.*** In many cases the customer does not ultimately install the equipment. In other cases, efficient equipment that is installed as part of an energy conservation program is later bypassed or removed by the customer. This is common for CFL programs.

• ***Persistence/failure.*** A certain percentage of installed equipment can be expected to fail or be replaced before the end of its useful life. Such early failure reduces the achieved savings as compared to pre-installation savings estimates.

• ***Rebound effect.*** Some conservation measures may result in savings during certain periods, but increase energy use before or after the period in which the savings occur. In addition, customers may use efficiency equipment more often due to actual or perceived savings.

• ***Take-back effect.*** A number of customers will use the reduction in bills/energy to increase their plug load or comfort by adjusting thermostat temperatures.

• ***Spillover.*** Spillover is the opposite of the free rider effect: customers that adopt efficiency measures because they are influenced by program-related information and marketing efforts, though they do not actually participate in the program.

Q. Are all these key factors included in estimating NTG ratios in every program study?

A. No, the number of key factors addressed in the net-to-gross ratio and the definition of those factors is not consistent from study to study. For instance, the 2007 NAPEE guide[11] states only three of the primary factors mentioned above (free riders, spillover, and rebound effect) and a fourth factor not mentioned above, transmission and distribution losses. Ameren Missouri states two primary factors (free riders and spillover) and a third potential factor, market effects, at pp. 55 – 56 of the Company's Report.

Q. Did Ameren Missouri provide NTGs for any of its past or existing DSM program?

A. Yes. Ameren Missouri provided the NTGs with free ridership and spillover for its prior DSM programs. Table 3 below summarizes the conclusions drawn by the Company from its EM&V reports.

<Table 3>
Net-To-Gross with Free Ridership and Spillover in Ameren Missouri Program

Programs	NTG	Free Rider	Spillover
RES-Lighting & Appliance	0.96	0.42	-
RES-Appliance Recycling	0.64	0.36	-
RES-HVAC	N/A	N/A	N/A
RES-Multifamily Low Income	0.91	0.09	-
C&I-Standard	0.90	0.11	0.054
C&I-Custom	0.86	0.14	0.11
C&I -Retro-Commissioning	0.83	0.17	0
C&I -New Construction	0.95	0.05	0

Note) The values in this table are the same as those in Table 3.9 of Company's Reports.

Q. How does the Company treat the net savings and the gross savings it expects to achieve from the DSM programs proposed in this MEEIA filing?

[11] National Action Plan for Energy Efficiency (2007). *Model Energy Efficiency Program Impact Evaluation Guide*. Prepared by Steven R. Schiller, Schiller Consulting, Inc. <www.epa.gov/eeactionplan>

A. Ameren Missouri assumed the net savings are equal to the gross savings i.e., the net-to-gross ("NTG") ratio is equal to one (1). There is one exception: Ameren Missouri used a NTG ratio for the Residential Refrigerator Recycling program of 0.64.

Q. Do you know why Ameren Missouri used a different NTG ratio for the Residential Refrigerator Recycling program?

A. Ameren Missouri explains its rationale at lines 8 – 13 on page 99 of its Report as follows:

> This program is unique in that it has a finite program duration, indicating a limited stock of available opportunities. Furthermore, EMV reports from Ameren Missouri as well as other jurisdictions indicate there are significant free riders who already remove and/or recycle their existing refrigerator or freezer. For these reasons, a NTG ratio other than 1.0 was used to model the residential refrigerator recycling program.

Q. Is it proper to assume the net savings are equal to the gross savings?

A. No. Ameren Missouri assumes that the spillover factor is equal to the free rider factor for all of the programs except the Refrigerator Recycling program. To estimate the actual net savings attributable to Ameren Missouri's DSM programs compared to what would have occurred if the program did not exist, the gross tracked savings from all the measures installed in the program must be adjusted for more of the NTG factors described above, factors such as the rebound factor. As shown in the Company's estimates of the NTG ratios of its prior DSM programs, the factors for the NTG ratios are different from program to program. Therefore, one ratio for all programs, except the Residential Refrigerator Recycle program, is not sufficient to examine the programs' effectiveness and to estimate the net savings attributable to Ameren Missouri's DSM programs.

Q. Does Staff find that Ameren Missouri has a reliable EM&V process?

A. Yes. Based upon my review of Ameren Missouri's EM&V reports which were provided by the Company during its quarterly DSM stakeholder meetings, Staff finds that the EM&V process used by the Company's EM&V contractors[12] is consistent with the industries practices.

Q. Does Staff have a recommendation for the Commission regarding the calculation of the net savings versus the gross savings for Ameren Missouri's DSM programs?

A. Yes. Staff recommends that the Commission order Ameren Missouri to verify gross savings and net savings through the EM&V process, without assuming that net savings is equal to gross savings. The gross savings from all the measures installed in Ameren Missouri's DSM programs must be adjusted for the different factors for calculating the NTG ratios as they change program by program to properly estimate the actual net savings attributable to the DSM programs.

Technical Resource Manual

Q. What has Ameren Missouri stated to be the purpose of Ameren Missouri's Technical Resource Manual ("TRM") for its MEEIA filing?

A. Ameren Missouri states the purpose of its TRM, at page 53 of the Company's Report, as follows:

> The Ameren Missouri TRM has been developed specifically to determine *a priori* compliance parameters for Ameren Missouri's 2013-2015 MEEIA filing – for cost effectiveness screening and program planning, tracking, reporting, independent program evaluator impact assessments, and *the calculation of Ameren Missouri performance incentives.* (Emphasis added)

Q. Does Staff have any concerns about Ameren Missouri's purpose for the TRM?

[12] Ameren Missouri's EM&V contracts for prior EM&V studies have been the Cadmus Group, Inc. for residential programs and the ADM Associates, Inc. for business programs.

A. Yes, it does. Staff is concerned that the Company wants to use its TRM to calculate the performance incentives for its DSM programs prospectively, not retrospectively. The savings estimates in Ameren Missouri's TRM are projections of gross savings, not net savings. If Ameren Missouri calculates its performance incentives based on its TRM, the Company will get prospective incentives based on the gross savings. Doing so contradicts Rule 4 CSR 240-20.093(2)(H)3. which states:

> Any utility incentive component of a DSIM shall be implemented on a retrospective basis and all energy and demand savings used to determine a DSIM utility incentive revenue requirement must be measured and verified through EM&V.

So, it is not proper to use Ameren Missouri's TRM to calculate the performance incentives for a DSM program without an EM&V process to estimate the net savings of the programs.

Q. Does Staff have any other issues with the Company's TRM?

A. Yes. During the Ameren Missouri's MEEIA technical conference, the consultants for Missouri Department of Natural Resource ("DNR"), GDS Associates, Inc. ("GDS"), raised some issues about the Company's TRM and made recommendations for revisions. For example, GDS pointed out that the energy saving equation for a high efficiency pool pump may give an unrealistic estimate. These issues and recommendations are valid, and Staff expects to see a full listing of recommended revisions in the rebuttal testimony that GDS files for DNR.

Q. What is Staff's recommendation to the Commission regarding the Company's TRM?

A. Staff recommends that the Commission not approve Ameren Missouri's TRM until after Staff has the opportunity to review the revisions contained in the rebuttal testimony of DNR and provide its views on them to the Commission.

Proposed Annual Energy and Demand Savings Levels

Q. How much energy savings does the Company expect to achieve from the DSM programs it is proposing the Commission approve?

A. Staff witness John A. Rogers summarizes the amount of savings from each program in his Schedule JAR-3.

Q. Has Staff reviewed how Ameren Missouri estimated these savings?

A. Yes, Staff has. Ameren Missouri used the DSMore™ computer software not only to estimate the cost-effectiveness test, but also to calculate the gross savings for its DSM programs. Staff reviewed the DSMore™ output files for each DSM program and compared the results to the savings stated in the Company's Report.

Q. Does Staff find Ameren Missouri's estimates to be reasonable?

A. Yes, Staff does.

Q. What is Staff's recommendation regarding Ameren Missouri's proposed annual energy and demand savings levels?

A. Staff recommends that the Commission find the Company's proposed annual energy and demand savings levels are reasonable given the programs' designs and planned spending levels.

Q. Does that conclude your rebuttal testimony?

A. Yes, it does.

LIST OF THE CONFERENCES AND WORKSHOPS

BY HOJONG KANG

June 14 – 15, 2010	***In-Depth Introduction to Electricity Markets***, presented by Electric Utility Consultants, Inc.
July 8 – 9, 2010	***Forecasting for Regulators***, presented by Institute of Public Utilities Regulatory Research and Education, Michigan State University
July 15 – 16, 2010	***Energy Efficiency for the Mass-Market***, presented by Electric Utility Consultants, Inc.
Sept. 23 – 24, 2010	***Innovative Regulatory Approaches to Accommodate Renewable Energy, Demand-Side Resources and Energy Efficiency Programs***, presented by Center for Public Utilities at the New Mexico State University and National Association of Regulatory Utility Commissioners.
Sept. 27 – 29, 2010	***2010 IES Street and Area Lighting Conference***, presented by Illuminating Engineering Society.
Sept. 30, 2010	***Southwest Region Workshop***, presented by Municipal Solid-State Street Lighting Consortium sponsored by the U.S. Department of Energy
Jan. 12 – 14, 2011	***Midwest Energy Solutions: Seizing the Momentum***, presented by Midwest Energy Efficiency Alliance
July 19, 2011	***Energize Missouri Industry Energy Efficiency Forum***, presented by Missouri Department of Natural Resources
Sept. 19 – 21, 2011	***2011 IES Street and Area Lighting Conference***, presented by Illuminating Engineering Society.
Sept. 25 – 26, 2011	***2011 National Conference on Energy Efficiency as a Resource***, presented by American Council for an Energy-Efficient Economy (ACEEE).
Jan. 11, 2012	***The Size of the Prize: Midwest Industrial Energy Efficiency Summit***, presented by Midwestern Governors Association, World Resources Institute, Midwest Energy Efficiency Alliance, and Great Plains Institute.
Jan. 11 – 13, 2012	***2012 Midwest Energy Solutions Conference***, presented by Midwest Energy Efficiency Alliance.

Series of Workshops for the Missouri Energy Efficiency Investment Act

- Apr. 14, 2010
- May 17 – 18, 2010
- Jun. 11, 2010
- Jun. 29, 2010