MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. EO-2012-0142

DIRECT TESTIMONY

OF

RICHARD A. VOYTAS

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a Ameren Missouri

St. Louis, Missouri
July, 2014

1   **DIRECT TESTIMONY**

2   **OF**

3   **RICHARD A. VOYTAS**

4   **FILE NO. EO-2012-0142**

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

6   A.   My name is Richard A. Voytas. My business address is One Ameren Plaza,

7   1901 Chouteau Avenue, St. Louis, Missouri 63103.

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

9   A.   I am employed by Ameren Services Company ("Ameren Services") as

10 Director of Energy Efficiency/Demand Response.   Ameren Services provides various

11 technical and corporation support services for Ameren Missouri and its sister companies in a

12 number of functions, including the area of energy efficiency and demand response.

13 **Q.   Please summarize your qualifications.**

14 A.   I have previously served as Chair of the Executive Board of the Association

15 For Demand Response and Smart Grid ("ADS").   I have represented Ameren on the

16 Leadership Group of National Action Plan For Energy Efficiency, and chaired the EPRI

17 Demand Response Systems project set in 2009-2010. In 2007, I chaired the NERC DSM

18 Influence On Reliability Task Force.

19 I have worked for Ameren for 38 years in positions ranging from Plant Engineering to

20 Fuel Procurement to Resource Planning and in Energy Efficiency and Demand Response

21 since 1995. I hold a B.S. in Mechanical Engineering from the University of MO-Rolla and

22 an MBA from St. Louis University. I am also a registered professional engineer.

23 **Q.   What is the purpose of your direct testimony?**

1   A.   The purpose of my testimony is twofold. First, I present evidence and

2   analysis that proves that energy savings achieved by Ameren Missouri's 2013 DSM portfolio

3   have been understated by Ameren Missouri EM&V contractors, Cadmus and ADM. Both

4   used, for most but not all program evaluations, standardized customer self-reporting surveys.

5   These surveys embody an inherent and recognized bias towards high free ridership to

6   estimate free ridership. Consequently, Ameren Missouri specifically asks the Commission to

7   revise estimates of free ridership for these programs and adjust the energy savings achieved

8   in 2013 based on a more in-depth approach supported by extensive market research as

9   proposed by Ameren Missouri. Second, I will address the asymmetrical approaches to assess

10   the net-to-gross ("NTG") ratio by both Cadmus and ADM that inadequately address the

11   impact of market effects on Ameren Missouri's 2013 DSM portfolio which also have the

12   impact of understating energy savings achieved by Ameren Missouri in 2013. Ameren

13   Missouri will not, at this time, ask the Commission to revise the NTG ratios for market

14   effects for those 2013 DSM programs where data for market effects was not available

15   therefore was not quantified.

16   **I.   BACKGROUND AND DEFINITION OF KEY TERMS**

17   **Q.   Describe the process contained in the Ameren Missouri MEEIA Cycle 1**

18   **Stipulation and Agreement for requesting the Commission to make changes to EM&V**

19   **report(s).**

20   A.   The "Change request" process is in the MEEIA 1 Stipulation and Agreement:

21
22   iv. Any stakeholder group participant who wants a change to
23   the impact evaluation portion of a Final EM&V Report will
24   have 21 days from the issuance of the Final EM&V Report to
25   file a request with the Commission to make such a change
26   ("Change Request"). Any stakeholder group participant filing a

1   Change Request will set forth all reasons and provide support
2   for the requested change in its initial Change Request filing.
3   Responses to a Change Request may be filed by any
4   stakeholder group participant and are due 21 days after the
5   Change Request is filed. The response should set forth all
6   reasons and provide support for opposing or agreeing with the
7   Change Request. Within two business days after the deadline
8   for filing a Change Request(if a Change Request is filed), the
9   Signatories agree that the stakeholder group participants will
10 hold a conference call/meeting to agree upon a proposed
11 procedural schedule that results in any evidentiary hearing that
12 is necessary to resolve the Change Request to be completed
13 within 60 days of the filing of the Change Request, and which
14 will recommend to the Commission that the Commission issue
15 its Report and Order resolving the Change Request within 30
16 days after the conclusion of such a hearing. The Signatories
17 anticipate a hearing with live testimony may be required to
18 resolve a Change Request, but if a hearing is not required, they
19 agree to cooperate in good faith to obtain Commission
20 resolution of a Change Request as soon as possible. The
21 Signatories will be parties to a Change Request resolution
22 proceeding without the necessity of applying to intervene. The
23 procedural schedule for such a Change Request proceeding will
24 provide that data request objections must be lodged within 7
25 days and responses will be due within 10 days (notifications
26 that additional time is required to respond will also be due
27 within 7 days).[1]

28

29 **Q.   List the specific programs for which Ameren Missouri requests that the**

30 **Commission change the estimate of free ridership as determined by either Cadmus for**

31 **residential programs or ADM for business programs.**

32

33 A.   The programs are as follows:

34

35 The residential programs are:

36

37   1. CoolSavers
38   2. ApplianceSavers
39   3. RebateSavers
40   4. CommunitySavers

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[1] Stipulation and Agreement, par. 11. (b.) iv., p. 16 – 17.

1   5. PerformanceSavers
2
3   The business programs are:
4
5   1. Custom
6   2. Standard
7   3. Retro commissioning
8   4. New Construction
9
10   **Q.   Please explain what is meant by the term "free ridership" in the context**

11   **of EM&V.**

12   A.   For consistency and to follow national best practices, I will reference all

13   definitions from the State & Local Energy Efficiency Action Network ("SEE") Energy

14   Efficiency Program Impact Evaluation Guide published in December 2012. The SEE

15   website is at www.seeaction.energy.gov. Page 5-1: "A free rider is a program participant

16   who would have implemented the program's measure(s) or practice(s) in the absence of the

17   program. Free riders can be (1) total, in which the participant's activity would have

18   completely replicated the program's intended actions; (2) partial, in which the participant's

19   activity would have partially replicated the program's actions; or (3) deferred, in which the

20   participant's activity would have partially or completely replicated the program's actions, but

21   at a future time beyond the program's time frame."

22   **Q.   What is a customer self-reporting survey and how does it relate to free**

23   **ridership?**

24   A.   Citing Page 5-3 in the SEE document: "Information reported by participants

25   and non-participants without independent verification or review. Respondents are simply

26   asked if they would have undertaken the action promoted by the program on their own

27   without the incentive (free ridership). Then, they are asked whether they had undertaken

28   additional energy efficiency actions (purchased products or made behavioral change) as a

1 result of their participation in the program (participant spillover). Through non-participant

2 surveys, respondents are asked if they had recently undertaken energy efficiency actions and

3 if those actions were undertaken as a result of the utility program(s) (non-participant

4 spillover)." Essentially, a self-reporting survey is one tool to attempt to measure free

5 ridership by simply asking the person if they would have taken energy saving measures even

6 if offered no incentive to do so. It is a very basic tool that is limited by its simplicity in

7 approach. The self-reporting survey assumes that a person will answer the question with

8 clear objectivity, and without concern about how they are perceived by the entity providing

9 the survey.

10   **Q.   What is a net-to-gross ("NTG") ratio?**

11   A.   Citing Page 3-7 in the SEE document: "These are ratios that are multiplied by

12 the gross savings to obtain an estimate of net savings…"

13   Citing Page 3-3 in the SEE document: "Gross energy savings are the changes in

14 energy consumption and/or demand that results directly from program-related actions taken

15 by participants in an efficiency program, regardless of why they participated…"

16   Also citing Page 3-3 in the SEE document: "Net energy savings are the changes in

17 energy consumption and/or demand that is attributable to a particular energy efficiency

18 program…"

19   **Q.   Finally, what are "market effects"?**

20   A.   Citing Page 5-1 in the SEE document: Market effects are "a change in the

21 structure of a market or the behavior of participants in a market that is reflective of an

22 increase (or decrease) in the adoption of energy-efficient products, services, or practices and

23 is causally related to market intervention(s) (e.g., programs). Examples of market effects

1   include increased levels of awareness of energy-efficient technologies among customers and

2   suppliers, increased availability of efficient technologies through retail channels, reduced

3   prices for efficient models, build-out of efficient model lines, and—the end goal—increased

4   market share for efficient goods, services, and design practices."

5   **II.   PROPOSED CHANGES RELATED TO THE MEASUREMENT**
6   **OF "FREE RIDERSHIP" USING SELF-SURVEYS**
7
8   **Q.   Why do customer self-reporting surveys bias estimates of free ridership**

9   **towards high free ridership?**

10   A.   Cadmus describes the issue with using customer self-reporting surveys to

11   estimate free ridership succinctly in their 2013 ApplianceSavers Impact evaluation.   The

12   following is an excerpt from the report:

13   Experience has shown that surveyed participants in utility
14   programs often exhibit socially desirable response bias—that
15   is, they shape their answers to reflect what they perceive the
16   surveyor thinks is the right answer. In this case, the tendency
17   toward social bias would result in participants exaggerating
18   their likely behavior regarding recycling their old appliances
19   independently of the ApplianceSavers program. Therefore,
20   collecting information from nonparticipants as to how they
21   actually discarded their operable appliance outside the program
22   offers us a way to assess the reliability of the hypothetical
23   responses provided by participants. Also, using both participant
24   and nonparticipant surveys is in alignment with evaluation
25   industry best practices for appliance recycling programs (per
26   UMP(Uniform Methods Project)) and increases the reliability
27   of the final net savings estimates. The demographics of the
28   surveyed participants were similar to those of the general
29   population. Though general population survey respondents
30   were less likely to own their homes than participant survey
31   respondents (74% and 93%, respectively, owned their homes),
32   they were just as likely as ARP (Appliance Recycling
33   Program) participants to have a bachelor's degree or better
34   (42% for both groups), and both groups had similar incomes
35   (42% and 41%, respectively, had household annual incomes of
36    $60,000 or more).
37

1   We used the supplementary information about actual disposal
2   methods to mitigate any bias inherent in the hypothetical
3   disposal methods suggested by program participants.
4   Specifically, we combined the information collected from
5   nonparticipants with the net-to-gross we calculated based on
6   participant self-reports, which resulted in a more accurate
7   assessment of ApplianceSavers true NTG.[2]

8

9   **Q.   Do you agree with Cadmus with respect to the bias inherent in self-**

10   **reporting surveys?**

11   A.   Yes, I do. Whenever people are asked if they would do the right thing, in this

12   case dispose of their refrigerators in an environmentally conscientious way, the

13   overwhelming tendency is to respond in the affirmative. Social scientists often refer to this

14   as the Hawthorne effect. The Hawthorne effect is a term referring to the tendency of some

15   people to work harder and perform better when they are participants in an experiment.

16   Individuals may change their behavior due to the attention they are receiving from

17   researchers rather than because of any manipulation of independent variables. Regardless of

18   whether the definition comes from academia or from real life experience, the reality is that

19   people often say they would take a specific action but actually do something completely

20   different. In the case of hypothetical telephone survey questions about whether customers

21   would have taken action to become more energy efficient on their own in the absence of

22   Ameren Missouri's energy efficiency programs, the overwhelming tendency for customers is

23   to respond affirmatively because it is the right thing to do. This bias towards wanting "to say

24   the right thing", of course, increases the estimate of free ridership.

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[2] Ameren Missouri ApplianceSavers Impact and Process Evaluation: Program Year 2013, May 15, 2014, p. 14.

1   **Q.   But Cadmus states that they mitigated any bias with their customer self-**

2 **reporting survey by asking the same survey questions to non-participants.   Please**

3 **explain Cadmus' rationale.**

4   A.   The same hypothetical questions about actions regarding refrigerator disposal

5 that were asked of participants in the 2013 Ameren Missouri ApplianceSavers program were

6 asked of non-participants.   In both cases, a telephone survey was conducted by an

7 independent third party.   Non-participants had no more or less incentive to display less

8 "say/do" bias than participants.   Regardless, additional independent verification or review

9 could have been done regarding the veracity of the answers of the respondents.

10   The frailty of using a non-participant survey to measure bias in this instance,

11 is that there is no logical or empirical support to conclude that the non-participant are any

12 less subject to the "socially desirable response bias" that participants. Moreover, the very

13 simple form of questions does bolster confidence in the results.

14   **Q.   Does the SEE Energy Efficiency Program Impact Evaluation Guide**

15 **published in December 2012 address the upward bias in free ridership estimates from**

16 **customer self-reporting surveys?**

17   A.   Yes. The following excerpt is from the SEE Evaluation Guide:

18   Surveys can be complex to design and administer.
19   Respondents' perception and understanding of the questions is
20   absolutely critical to the success of the inquiries…

21   The survey approach is the most straightforward way to
22   estimate free ridership and spillover. It is also the lowest cost
23   approach. It does, however, have its disadvantages, regarding
24   potential bias and overall accuracy. For example, typical
25   responses such as "don't know," missing data, and inconsistent
26   answers are very hard to address without additional data
27   collection. While there are ways to improve survey quality
28   (e.g., using techniques like adding consistency check questions

1   and adjusting the individual's estimate accordingly), the
2   accuracy of simple self-reports is typically marginal.

3   One of the elements that should be addressed in surveys is self-
4   selection bias. Self-selection bias is possible whenever the
5   group being studied has any form of control over whether to
6   participate in the survey; for example, people who have strong
7   opinions or substantial knowledge may be more willing to
8   spend time answering a survey than those who do not. Self-
9   selection bias is related to sample selection bias and can skew
10   the results of a NTG analysis that is not very well planned,
11   funded, and/or executed.

12   Another form of survey bias is response bias: the tendency of
13   respondents to gauge their responses to conform to socially
14   acceptable values. This issue is well recognized in social
15   sciences and is discussed in a vast body of academic and
16   professional literature. Another aspect of response bias is
17   construct validity, which raises questions about what the
18   survey results actually measure. The problem stems from the
19   fact that while survey respondents, by virtue of their
20   participation in the program, are predisposed to efficiency, it is
21   not clear to what extent their responses are conditioned by the
22   effects of the program itself.[3]

23   The SEE EM&V guide goes on to state:

24   In addition, in areas with long histories of efficiency programs
25   and activities and many programs operating at the same time, it
26   may not be possible to parse out who is a free rider and who
27   was influenced by the program. In effect, it may be that, in the
28   case of transformed markets or markets being transformed,
29   what is being measured in free-ridership surveys is in fact
30   spillover from other programs.[4]

31   **Q.   Are either Cadmus or ADM on record in the public domain regarding**

32   **high free ridership bias associated with customer self-reporting surveys?**

33   A.   Cadmus published a nationally recognized article on "The Trouble With

34   Freeriders" in the March 2012 issue of *Public Utility Fortnightly* ("PUF"). Cadmus most

35   definitely, perhaps more so than the EM&V contractor community in general, understands

[3] SEE Action, *Energy Efficiency Program Impact Evaluation Guide*, December 2012, p. 5-5.
[4] *Id.*, p. 5-8.

1   the pitfalls associated with even attempting to estimate free ridership with any measureable

2   accuracy or precision via customer self-reporting surveys. Cadmus' discussion of the issues

3   associated with self-reporting surveys shows that they are well aware of the pitfalls. Here is

4   what Cadmus states in the PUF article:

5   …The obvious limitation of the self-report approach is that it
6   doesn't produce an NTG ratio. Other components of NTG—
7   spillover and market transformation effects—have to be
8   estimated separately and then factored into the calculations.
9   But eliciting reliable information about intentions and
10   motivations can be thorny. Using surveys to assess free
11   ridership also raises concerns about response bias, particularly
12   those biases involving social desirability, which is the tendency
13   of respondents to gauge their responses to conform to socially
14   acceptable values. This issue is well recognized in social
15   sciences, and it's discussed in a vast body of academic and
16   professional literature, including conservation program
17   evaluation manuals. One aspect of social desirability is the
18   tendency of respondents to offer what they think is the right
19   answer, and this tends to result in an overstatement of free
20   ridership. Also, as some evaluation experts have noted, people
21   have internal reasons as explained by social psychology's
22   attribution theory that motivate them to make certain decisions
23   and to follow a cognitive process for justifying those
24   decisions…

25

26   **…**A report produced by an independent evaluator in 2006,
27   summarizing the results of recent programs in California, noted
28   that "the issues of identifying free riders are complicated and
29   estimating reliable program-specific free ridership is
30   problematic at best." One year later, the California Public
31   Utilities Commission formed a working group of experts to
32   explore ways to improve the self-report method and produce
33   standardized questionnaires to collect the data and algorithms
34   to analyze them consistently. The result was 17
35   recommendations that were largely useful but somewhat too
36   general to address the fundamental shortcomings of the
37   approach. A 2011 study commissioned by the Association of
38   Energy Efficiency Program Administrators in Massachusetts
39   developed survey instruments to assess free ridership and
40   spillover in the commercial and industrial sectors. These
41   instruments go a long way toward standardizing the data
42   collection, scoring, and analytic steps.   The study concludes

1   that the self-report techniques are "based on sound
2   methodologies and are consistent with analytical methods used
3   in the social sciences**." But the study doesn't satisfactorily**
4   **address the essential questions of response bias." (emphasis**
5   **added)**[5]

6

7   **Q.   Please comment on the Cadmus perspective on free riders and customer**

8 **self-reporting surveys as stated in the PUF article referenced in the prior question.**

9   A.   Cadmus wrote the most comprehensive, thoughtful, and analytic explanation

10 of the two issues that I have read on the subject. There should be no question that Cadmus

11 understands beyond a shadow of a doubt the issues underlying the high free ridership bias

12 resulting from the use of customer self-reporting surveys. In this case, applying the concepts

13 in the article will better quantify the savings associated with the programs and will reflect the

14 true customer benefits, and mitigated the impact of bias on the measurement of free ridership.

15   **Q.   In the MEEIA Cycle 1 filing, did Ameren Missouri address the issue of**

16 **bias as well as lack of precision and accuracy associated with estimates of free ridership**

17 **using customer self-reporting surveys?**

18   A.   Yes. The same issues of bias, inaccuracy and lack of precision in the estimate

19 of free ridership were discussed and efforts were made to quantify and apply appropriate

20 "say/do" adjustment factors to customer self-reporting surveys administered to estimate DSM

21 program participation rates in the 2010 and 2013 DSM Potential studies. Supporting

22 documentation in the MEEIA Cycle 1 filing included references to the following:

23

24   **1. A National Review of Best Practices and Issues in Attribution and**
25   **Net-to-Gross: Results of the SERA/CIEE White Paper:** This 2010 whitepaper
26   from the California Institute For Energy and the Environment ("CIEE") laments at
27   length the lack of certainty and omission of any type of discussion of confidence
28   around estimates of free ridership using customer self-reporting surveys.

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[5] <u>The Trouble With Freeriders</u>, Haeri and Khawaja, *Public Utility Fortnightly,* March 2012.

1   **2. Lessons Learned and Next Steps in Energy Efficiency Measurement and**
2   **Attribution: Energy Savings, Net to Gross, Non-Energy Benefits, and Persistence**
3   **of Energy Efficiency Behavior:** This CIEE 2009 whitepaper discusses, among other
4   issues, that surveys are better suited to upstream actors rather than end-use
5   consumers. The study also lists the major challenges associated with the usefulness
6   of customer self-reporting surveys as:
7
8   o   The lag between campaigns hitting the street and evaluation of the program;
9   o The self-report (awareness) problem;
10   o Getting through the clutter of energy conservation ads and finding a sample that
11   has been exposed to your message;
12   o Attribution of the effect from your program's efforts, distinct from the clutter of
13   other (nationwide, local, regional) campaigns, incentives, and messages
14   affecting behavior;
15   o Evaluating/measuring the level or degree of the change and sorting out the
16   say/do gap (i.e., identifying appropriate / useful metrics, and verifying the
17   change); and
18   o Assessing retention of the change.
19
20   **3. Salt River Project Net-to-Gross: Updating Research:** The Cadmus Group
21   prepared this presentation in December 2011. Cadmus discusses the shortcomings of
22   attempting to estimate free ridership through the use of self-reporting surveys.
23   Pertinent points from the presentation are:
24   **a.** Basic construct is invalid because participants may be predisposed to
25   conservation
26   **b.** Responses may be conditioned by psychological effects of the program
27   **c.** May be measuring effect of program, not what would happen in the absence
28 **An Approach For Evaluating The Market Effects of Energy Efficiency Programs:**

29   This 2010 whitepaper written by a panel of authors including Nobel Prize winner

30 Edward Vine focuses on the legitimacy of market effects. Part of the discussion, however,

31 includes an analysis of the uncertainties associated with self-reporting surveys. Edward Vine

32 states "And there is always the potential for self-selection bias in finding respondents willing

33 to answer a survey; complicating this situation is the possibility of respondents providing

34 inaccurate responses to advance their own self-interest through their survey responses."

35
36   **III.   EXAMPLES OF THE EXISTENCE OF UPWARD BIAS**
37   **IN THE ESTIMATE OF FREE RIDERSHIP IN 2013**
38   **AMEREN MISSOURI INDIVIDUAL PROGRAM EM&V REPORTS**
39

1   **Q.   Is there evidence of bias in terms of Cadmus overestimating free**

2   **ridership for the CoolSavers, the residential heating, ventilation and cooling program,**

3   **for 2013?**

4   A.   Yes. Page 57 of the 2013 CoolSavers Impact Evaluation states:

5
6   All contractors agreed that the timing of many customers'
7   decisions to install a new unit definitely was influenced by the
8   early replacement incentive.
9   When asked what percentage of their customers decided to
10   replace this year, the contractors typically responded that about
11   one-half to two-thirds replaced their systems this year due to
12   the incentive when they otherwise would have deferred
13   replacement. As these responses do not agree with the
14   participants' self-reported responses (about 60% claimed they
15   planned to replace this year, even without the incentive), we
16   adjusted free ridership scores. If a participant claimed an
17   intention to install this year, but also said their contractor had
18   an important influence on the decision to install the new
19   system, we applied a decrement to the free ridership score; so
20   the results would more closely align.[6]

21
22   **Q.   Please explain how this excerpt supports your argument concerning the**

23   **use of surveys to measure free ridership.**

24   A.   The excerpt demonstrates that Cadmus recognizes customers overestimated

25   that they would have installed more efficient air conditioners when asked via a telephone

26   survey. Contractors or trade allies, who know when sales volumes change meaningfully

27   from year-to-year, saw a definite correlation between increased efficient air conditioner sales

28   and the Ameren MO CoolSavers program and associated customer financial incentives in

29   2013. This is proof positive that the CoolSavers customer self-reporting surveys yield

30   estimates of free ridership that were biased in the high direction. It is also illustrative of the

31   inherent subjectivity in a survey approach, where the customer is asked to speculate about

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[6] Ameren Missouri CoolSavers Impack and Process Evaluation: Program Year 2013, May 15, 2014, p. 57.

1   their relative motivations to undertake a certain initiative. Obviously, a consumer makes

2   purchasing decisions based upon many influences, including some that may not be

3   consciously recognized at the time the affirmative choice is made.

4   **Q.   How did Cadmus adjust the customer free ridership number to reflect**

5   **the additional information gleaned from talking to trade allies?**

6   A.   Cadmus used subjective judgment to make relatively minor adjustments to the

7   free ridership scores. For new installations if respondents claimed the incentive had little or

8   no impact on their decision to install a high-efficiency system but also claimed the

9   contractor's influence was important, they applied a decrement (25%) to that respondent's

10 free ridership score. They did this for both early replacement measures (considering "when")

11 and for the HVAC efficiency (considering "what" they would have installed). The basis is

12 that contractors are promoting installation of high efficiency equipment and encouraging

13 replacement now – and they claim the incentive is helping them do so (contract responses did

14 not align with customer responses). For tune-ups if a participant claimed they would have

15 received the tune-up and only had the condenser cleaned, the contractor's influence was not

16 considered because Cadmus assumed the same type of tune-up would have occurred. If the

17 participant received air flow adjustment or refrigerant charge adjustment, and also claimed

18 <u>they would have had their</u> unit tuned up without the program, they received a 50% free

19 ridership decrement because Cadmus assumed the contractors program tune-up achieved a

20 greater efficiency improvement (the Cadmus assumption was 50%) than a typical tune-up

21 without any program.

22   **Q.   Did Cadmus address the bias in the customer self-reporting survey basis**

23 **for quantifying free ridership with the adjustments discussed above?**

1   A.   No. The impact on the overall free ridership score was only 2% for the new

2   installation systems and was 16% for tune-up systems. We will recommend a far more in-

3   depth approach based on actual market research experience that results in a much greater

4   adjustment to free ridership to account for the customer "say/do" factor. By "say/do" I am

5   referring to the difference between what a customer may say they would or would not do,

6   and the actions that they ultimately take. Customers may say that they are going to take

7   energy efficient measures, but they may not take action but for an incentive to act.

8   **Q.   Is there evidence of bias in terms of Cadmus overestimating free**

9   **ridership for the ApplianceSavers, the residential appliance recycling program, for**

10   **2013?**

11   A.   Yes. At the beginning of my testimony, I provided the references from the

12   Cadmus report specifically calling out the bias in the free ridership estimate from the

13   customer self-reporting surveys.

14   **Q.   Did Cadmus adjust the customer free ridership number to account for**

15   **the upward bias in their estimate of free ridership?**

16   A.   They did not materially adjust the results to correspond with a more in-depth

17   measurement of actual free ridership free of survey bias. The fact is that Ameren has a

18   plethora of primary market data that clearly shows that free ridership for this program in

19   2013 should be minimal. Yet, the Cadmus estimate of free ridership for this program in 2013

20   is higher than it has ever been before. We will show the Commission clear, compelling

21   evidence that free ridership for this program should be minimal for 2013.

22   **Q.   In the interest of time, please limit your discussion to three key pieces of**

23   **evidence that speak to low free ridership for the ApplianceSavers program for 2013.**

1   A.   The first significant piece of evidence is that beginning in 2013 Ameren

2   Missouri increased the incentive or "bounty" it offered customers to turn in their secondary

3   refrigerators from $35 to $50 – a 43% increase. There usually is a direct correlation between

4   increasing incentives and a decrease free ridership. In fact, according to a September 18,

5   2013 Appliance Recycling Program Process and Market Characterization Study done by

6   Cadmus for Calmac, the $50 incentive offered by Ameren Missouri ranks as tied as the

7   highest refrigerator recycling incentive offered in the nation. Cadmus goes on in the Calmac

8   study to state:

9   1. Incentive levels have a negative effect on free ridership. Programs with higher
10   incentives also tend to have higher NTG ratios.
11   2. Program maturity has a negative effect on free ridership. In other words, the longer a
12   program exists, the lower the free ridership ratio. (Note that the Ameren Missouri
13   refrigerator recycling program has been in place since 2010.)[7]
14
15   The Ameren Missouri refrigerator recycling program has both of these attributes yet

16   the estimate of free ridership increased from 36% as stated in the Ameren Missouri MEEIA

17   Cycle 1 technical reference manual ("TRM") to 40% in 2013. There is no evidence, other

18   than the Cadmus administered self-reporting survey with its associated bias towards high free

19   ridership, to persuade the Commission of why free ridership should increase for this program

20   in 2013.

21   Q.   **What is the second key piece of evidence that speaks to much lower free**

22   **ridership rates for the ApplianceSavers program in 2013?**

23   A.   Ameren Missouri specific primary market research where the count of the

24   actual number of primary and secondary refrigerators in each home was estimated with

25   greater than 90% accuracy and 10% precision is crucial to understanding the magnitude, if

---

[7] Ameren Missouri, BizSavers Program Evaluation Report, January 2013 – December 2013, Final Report: June 2014, p. 4-1 thru 4-7.

1   any, of free ridership associated with this program. In 2010 Ameren Missouri completed a

2   primary market research study that showed that the saturation of secondary refrigerators

3   within the Ameren Missouri service territory was 39%. In 2013 Ameren Missouri completed

4   a follow-up market research study that showed the saturation of secondary refrigerators

5   increased to 41%. Recall that Ameren Missouri began its appliance recycling program in

6   2010. The expectation with the information and education around secondary refrigerator

7   energy usage that Ameren Missouri has devoted significant resources to, not to mention the

8   thousands of secondary refrigerators that Ameren has recycled since 2010, should be that the

9   market saturation of secondary refrigerators should have declined since 2010. Yet, the

10   increase in the estimate of free ridership for this program, as estimated by Cadmus from

11   customer self-reporting survey data, would indicate otherwise. The message that a higher

12   free ridership estimate sends is that customers have changed their energy consumption

13   behavior in terms of secondary refrigerator usage and are now more apt on their own to find

14   an environmentally sound way to dispose of working secondary refrigerators. Consequently,

15   rather than increase, the market saturation of secondary refrigerators should have decreased

16   as a direct result of the Ameren Missouri ApplianceSavers program. Cadmus' estimate of

17   higher free ridership is counterintuitive with the primary market research as to what actually

18   is happening in the residential market place. Rather than penalize the Ameren Missouri

19   attribution for program kWh, the free ridership estimates should have decreased to reflect the

20   fact that the market is not moving in spite of the impetus provided by the Ameren Missouri

21   ApplianceSavers program.

22   Ameren Missouri has been running the program since 2010. Early adopters or free

23   riders would have already participated. Ameren Missouri in 2013 reached the customers who

1   have previously held on to their secondary units but now have been swayed by the intensive

2   marketing campaign by Ameren Missouri to recycle secondary units.

3   **Q.   What is the third key piece of evidence that speaks to much lower free**

4   **ridership for the ApplianceSavers program in 2013?**

5   A.   Ameren Missouri honed and continues to improve its targeted marketing for

6   the ApplianceSavers programs. Ameren Missouri in 2013 utilized data that yield high

7   propensity and high refrigerator energy usage to target market to those customers with the

8   greatest potential to reap annual energy savings from recycling their secondary refrigerators.

9   This simply reaffirms the fact that Ameren Missouri is consciously target marketing to those

10   customers who otherwise would not have participated in the program. These customers

11   definitely should not be considered free riders.

12   **Q.   Is there evidence of bias in terms of Cadmus overestimating free**

13   **ridership for the RebateSavers, the residential program to deliver energy efficient**

14   **equipment directly to customers, for 2013?**

15   A.   Yes. The 2013 RebateSavers report states:

16   The Cadmus team's findings from interviews with retailers
17   conflicted slightly with customer reports, in that 32% said a
18   store representative told them about the rebate. Six of the 10
19   retailers we spoke with said they talked with customers about
20   the available rebates, either by mentioning the rebates
21   proactively or by informing customers who asked about
22   energy-efficient appliances.[8]
23
24   The significant uncertainty associated with Cadmus' estimate of free ridership in the

25   RebateSavers may be even orders of magnitude greater than it is for the other residential

26   programs. Cadmus relied upon two data collection methods to assess net savings: a phone

_____

[8] Ameren Missouri RebateSavers Impact and Process Evaluation: Program Year 2013, May 15, 2014, p. 33.

1   survey and an online survey. The phone results showed an average free ridership rate of 32%

2   across all respondents. The online survey showed an average free ridership rate of 15%.

3   This are obvious examples of the very real customer self-reporting bias towards high

4   estimates of free ridership that ultimately minimize Ameren Missouri's ability to be credited

5   with the appropriate attribution for achieving energy savings from this program.   The

6   RebateSavers example also illustrates the almost boundless range of uncertainty around

7   customer self-reporting surveys simply due to the medium used – phone survey or online

8   survey.

9   **Q.   Is there evidence of bias in terms of Cadmus overestimating free**

10   **ridership for the CommunitySavers, the residential program directed to the hard-to-**

11   **reach residential customer segment, for 2013?**

12   A.   Yes.   Since this program is marketed to customers and landlords who

13   generally do not have the resources to invest in energy efficiency, the expectation would be

14   that free ridership is zero. Yet, true to form, this program also utilized phone surveys to

15   property managers to assess free ridership. Based on the self-reporting survey data, which by

16   now should be obvious that overestimates free ridership, free ridership was estimated to be

17   4.2% in 2013 for this program because some property managers stated that they would have

18   done the right thing in terms of becoming more energy efficient even without the Ameren

19   Missouri program.

20   **Q.   Is there evidence of bias in terms of ADM overestimating free ridership**

21   **for the Custom, Standard, Retro Commissioning, and New Construction programs in**

22   **2013?**

1   A.   Unlike the approach taken by Cadmus for the residential programs, ADM did

2   not attempt to survey the business program trade allies to determine how their sales had been

3   affected by the Ameren Missouri business DSM programs. ADM did not attempt to review

4   customer maintenance records to see if there was a pattern of upgrading equipment to more

5   efficient standards. ADM did not use multiple approaches, i.e. online surveys vs. phone

6   surveys, to attempt to determine the consistency in survey responses. Consequently, the

7   ADM approach to estimate free ridership solely through the use of customer self-reporting

8   surveys should be considered a minimalist approach that does not provide much useful

9   information in terms of gauging the magnitude of the bias associated with the customer self-

10   reporting surveys. That being said, there should be no question that the customer self-

11   reporting bias towards high estimates of free ridership is as much of an issue with the

12   business programs as it is with the residential programs.

13   **Q.   What was approach ADM took to estimate free ridership?**

14   A.   Basically, ADM estimated free ridership based on customer responses to the

15   following three survey questions:

16

17   1. Would you have been financially able to install the equipment or measures without
18   the financial incentives from the BizSavers program?
19   2. Did you have plans to install the measure before participating in the program?
20   3. Would you have gone ahead with this planned installation of the measure even if you
21   had not participated in the BizSavers program?[9]
22
23   These three hypothetical questions are extremely difficult to answer with any

24   reasonable degree of comprehension by the customers. The answers will depend upon such

25   variables as: (1) the person who responds to the survey; (2) timing of the survey relative to

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[9] Cadmus Appliance Recycling Program Process Evaluation and Market Characterization, Volume 1, Calmac Study, September 18, 2013, p. 34-35.

1   the decision to make an investment in energy efficiency; (3) the season, day, and time of day

2   when the survey was administered. Consequently, with such highly qualitative, subjective

3   responses there is no possible way to estimate the accuracy or precision associated with the

4   sample of customers to whom the surveys were administered.

5   **Q.   Did ADM estimate market effects for any one or all of the business**

6   **programs in 2013?**

7   A.   No. The very real concern of Ameren Missouri is that it may not be receiving

8   the appropriate attribution or credit in terms of kWh load reductions actually achieved which

9   the Company has earned through its extensive outreach in its business DSM programs.

10   **Q.   Did ADM estimate non-participant spillover for any one or all of the**

11   **business programs?**

12   A.   No. Again, the very real concern of Ameren Missouri is that it may not be

13   receiving the appropriate attribution or credit in terms of kWh load reductions actually

14   achieved which the Company has earned in 2013 through its extensive outreach in its

15   business DSM programs.

16   **Q.   How critical is it to customers, regulatory stakeholders and Ameren**

17   **Missouri that EM&V contractors take a balanced approach to estimate both the upside**

18   **and downside aspects of the net-to-gross ("NTG") ratio that is critical to determining**

19   **the actual annual kWh load reductions achieved for each DSM program?**

20   A.   The allocation of appropriate resources by EM&V contractors to take a

21   balanced approach to estimate NTG should be the highest priority by EM&V contractors.

22   NTG has a direct impact on the calculation of the net benefits to customers from participation

23   in the programs. NTG also has a direct impact on Ameren Missouri's ability to have the

1   opportunity to earn financial performance incentives by meeting threshold 3-year DSM load

2   reduction targets. Consequently, if EM&V contractors estimate free ridership using methods

3   that are inherently biased towards high free ridership but ignore the impact of market effects

4   and non-participant spillover then the true net savings are not identified and Ameren

5   Missouri is unjustly penalized by EM&V contractors using asymmetric approaches to

6   estimate NTG.

7   **Q.   Should the Commission acquiesce to a conclusion that it knows to be**

8   **systemically biased?**

9   A.   Certainly not. For utilities, such as Ameren Missouri which administer

10   ratepayer-funded DSM programs, the implications of NTG calculations can be large and

11   wide-ranging. The calculations affect nearly all essential criteria that define and determine

12   performance, particularly energy saving claims and cost-effectiveness. Uncertainty arises

13   because the NTG ratio usually isn't known until well after a program has been implemented.

14   Utilities become exposed to financial risks, particularly in jurisdictions where performance

15   standards include either penalties for under-performance or financial rewards for over-

16   performance. There should be no room to allow either known biases to exist or the omission

17   of estimates of all components in the NTG equation in the assessment of NTG.

18   **Q.   Market research in the form of administering customer surveys is a**

19   **common practice across most industries. Is there research and actual field derived data**

20   **that more realistically adjusts for the customer "say/do" bias associated with these**

21   **surveys?**

22   A.   Yes. Market researchers have long recognized that customers tend to over-

23   estimate their likelihood to participate in new programs and services within the context of a

1   market research study. This means that some customers who say in a survey that they would

2   be certain to participate in a given program, in reality, do not participate. This is often

3   referred to as the "say-do" problem; the problem that the percentage of survey respondents

4   saying that they are likely to take an action is higher than the percentage who actually end up

5   doing it.

6   The analytic challenge, as a result, is to appropriately adjust stated likelihood-to-

7   participate ratings into more realistic estimates of likely customer response.

8   **Q.   Please explain more about Ameren Missouri's efforts to quantify and**

9   **apply appropriate "say/do" adjustment factors to customer self-reporting surveys**

10   **administered to estimate DSM program participation rates in the 2010 and 2013 DSM**

11   **Potential studies?**

12   A.   Ameren Missouri contracted with EnerNoc Energy Solutions for both studies.

13   EnerNoc in turn subcontracted with Dr. David Lineweber to address quantitatively the

14   "say/do" adjustment factor. Dr. Lineweber has been conducting market research for electric

15   and gas utility companies for nearly 20 years. Over that time, he has conducted literally

16   hundreds of research projects on a wide variety of subjects for utilities. Included in his

17   portfolio are more than 25 quantitative projects relating to residential and/or commercial &

18   industrial appliance and end use saturation and/or penetration.

19   **Q.   Describe the research methodology that Dr. Lineweber employed to**

20   **account for the "say/do" bias issue.**

21   A.   The method used by Dr. Lineweber is based on proprietary research

22   conducted by his team during 2010. This research captured stated likelihood to adopt or

23   purchase a variety of new products and services, at one point in time, and then tracked actual

1   adoption or purchase over 6–12 months. As expected, people were less likely to actually

2   purchase products or services than they estimated they would be at an earlier point in time.

3   The primary adjustment factors observed in that research were used to translate stated intent

4   to realistic estimates of likely behavior. The adjustment factors were a function of how the

5   respondent answered each of the "likelihood to acquire" questions, and on their level of

6   information about, and familiarity with energy efficiency issues.

7   **Q.   Please provide the adjustment factors and the rationale for using them**

8   **from Dr. Lineweber's work.**

9   A.   Essentially, the primary adjustment for those residential respondents who rate

10 a given program as a "10" ("extremely likely to participate") and who also are rated as

11 "high" on EE information / familiarity, then realistically, about 56% of those people will

12 ultimately sign up for the program. At the other end of the scale, among the respondents who

13 rate their likelihood to participate as a "1" on the scale ("extremely unlikely to participate"),

14 only 5% of those households will ultimately sign up for the program.

15   The following table translates stated intent into "take rates" for actions for residential

16 customers.

17 **Translating Stated Intent into Take Rates for Irregular Purchases, Residential**
18 **Customers with High Information Levels**
19

Scale Rating	Adjustment Value for Irregular Purchases
1	5%
2	5%
3	6%
4	6%
5	18%
6	20%
7	31%
8	38%
9	44%

10	56%

1

2 Business customers have a different scale – again based on Dr. Lineweber's research. The

3 business equivalent table is as follows:

4

5 **Translating Stated Intent into Take Rates for Irregular Purchases, Business**

6 **Customers with High Information Levels**

7

Scale Rating	Adjustment Value for Irregular Purchases
1	0%
2	0%
3	0%
4	5%
5	12%
6	26%
7	44%
8	58%
9	67%
10	83%

8

9

10 **Q.   How do you propose or recommend that the preceding tables be applied**

11 **to the individual program free ridership estimates where customer self-reporting**

12 **surveys were used?**

13   A.   Starting with the 2013 Business Custom program, we propose that customer

14 responses to the free ridership questions in the self-reporting surveys be multiplied by 83%

15 from the preceding table developed by Dr. David Lineweber. This should be interpreted as

16 implying that if customers stated they were 100% certain that they would take the same

17 energy efficient action as offered by an Ameren Missouri DSM program then the reality is

18 that 83% of those customers would actually take the action indicated.

19   Mathematically, this is how the Custom program free ridership score was estimated

20 by ADM:

21

1 *Table 4-3 Estimated Free-ridership for kWh Savings from Custom Program Projects*
2

Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 1)	Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 2)	BizSavers Program had influence on Decision to Install Measure?	Had Previous Experience with Measure?	Percentage of Total Gross ex post kWh Savings	Free Ridership Score
N	N	N	N	33.53%	0.00%
N	N	N	Y	1.39%	33.33%
N	N	Y	N	5.77%	0.00%
N	N	Y	Y	0.07%	0.00%
N	Y	N	N	2.57%	33.33%
N	Y	N	Y	0.25%	66.67%
N	Y	Y	N	0.25%	0.00%
Y	Y	N	N	1.29%	100.00%
Y	Y	N	Y	5.10%	100.00%
Required program incentive to implement measures.				49.78%	0.00%
Total				100.00%	7.88%

3
4 Ameren Missouri proposes that the preceding table be adjusted as follows to account for the
5 customer "say/do" bias:
6
7 *Table 4-3 Estimated Free-ridership for kWh Savings from Custom Program Projects*

Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 1)	Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 2)	BizSavers Program had influence on Decision to Install Measure?	Had Previous Experience with Measure?	Percentage of Total Gross ex post kWh Savings	Free Ridership Score	Free Ridership Score After application of 83% "say/do" adjustment
N	N	N	N	33.53%	0.00%	0%
N	N	N	Y	1.39%	33.33%	27.64%
N	N	Y	N	5.77%	0.00%	0%
N	N	Y	Y	0.07%	0.00%	0%
N	Y	N	N	2.57%	33.33%	27.64%
N	Y	N	Y	0.25%	66.67%	55.29%
N	Y	Y	N	0.25%	0.00%	0%
Y	Y	N	N	1.29%	100.00%	83%
Y	Y	N	Y	5.10%	100.00%	83%
Required program incentive to implement measures.				49.78%	0.00%	0%
Total				100.00%	7.88%	6.54%

8
9

1   **Q.   Do you consider this process to adjust free ridership scores from**

2   **customer self-reporting surveys conservative, i.e. yielding still too high an estimate of**

3   **free ridership?**

4   A.   Yes. We placed higher priority on simplicity of approach rather than accuracy

5   of the adjustment. We choose to use the highest possible free ridership adjustment factor

6   from the table developed by David Lineweber.   A more accurate but formulaically

7   challenging approach would have been to apply the full gamut of adjustment factors ranging

8   from 0% to 83% depending on the specific responses of individual customers to each free

9   ridership survey question. This would have yielded much lower free ridership scores for

10   each program.

11   **Q.   Using the free ridership adjustment methodology described, list the free**

12   **ridership adjustment factors for the other Ameren Missouri DSM programs where free**

13   **ridership was based on customer self-reporting surveys.**

14   A.   The following table lists the programs, original free ridership scores, adjusted

15   free ridership scores, original net kWh and adjusted net kWh for each program.   In the

16   interest of time and space, I've attached the detailed worksheets associated with the adjusted

17   free ridership calculations for each program in Appendix A.

18

	Original Free Ridership	Adjusted Free Ridership	Original Net kWh	Adjusted Net kWh	Difference kWh
ApplianceSavers	39%	22%	5,171,803	6,360,537	1,188,734
CommunitySavers	4%	2%	5,890,076	6,004,832	114,756
ConstructionSavers	72%	72%	67,356	67,356	0
CoolSavers	25%	14%	23,940,658	26,717,884	2,777,226
LightSavers	20%	20%	279,126,792	279,126,792	0
PerformanceSavers	17%	7%	289,957	320,204	30,247

RebateSavers	13%	8%	7,794,733	8,333,747	539,014
Residential Total			322,281,375	326,931,352	4,649,977

1
2
3
4

	Orginal Free Ridership	Adjusted Free Ridership	Original Net kWh	Adjusted Net kWh	Difference kWh
Custom	7.88%	6.54%	43,875,548	44,511,860	636,312
Standard	4.79%	3.98%	23,899,394	24,103,107	203,713
New Const.	6.00%	4.98%	204,121	206,777	2,656
RCx	33.00%	27.39%	223,759	243,707	19,948
Business Total			68,202,822	69,065,451	862,629
Portfolio Total			390,484,197	395,996,803	5,512,606

5
6
7   **IV.   MARKET EFFECTS**
8
9   **Q.   Are market effects legitimate components in the computation of the NTG**

10   **ratio?**

11   A.   Yes. Without question market effects are legitimate components of NTG. In

12   fact, the issue of market effects was discussed as a real and meaningful component of the

13   NTG component in the Ameren Missouri MEEIA Cycle 1 filing. It was also discussed and

14   acknowledged as a legitimate factor to be accounted for in the NTG calculation by multiple

15   interveners in the MEEIA Cycle 1 case. The specific organizations that spoke to the reality

16   and necessity of calculating market effects were Ameren Missouri, National Resource

17   Defense Counsel ("NRDC") and the Missouri Public Service Commission Staff. In addition,

18   market effects and supporting documentation were discussed in MEEIA Cycle 1 technical

19   conferences and EM&V meetings with stakeholders.

1   **Q.   Is the calculation of market effects and the inclusion of market effects in**

2   **the NTG calculation recognized as a national best practice?**

3   A.   Yes. The State and Local Energy Efficiency Action Network ("SEE") is the

4   successor organization to the Leadership Group of the National Action Plan For Energy

5   Efficiency ("NAPEE"). As such, SEE continues to write guide books for all aspects of DSM

6   planning, implementation and evaluation. The guide books define national best practices in

7   these areas. The SEE "Energy Efficiency Program Impact Evaluation Guide" published in

8   December 2012 contains elongated discussions on the importance of capturing market

9   effects. Perhaps the most poignant excerpt from the SEE evaluation guide regarding the

10   absolute necessity of calculating marketing effects is stated below. The excerpt states:

11
12   Market Evaluations: a very broad category of activities that
13   document aspects of the marketplace with respect to energy
14   efficiency. One particular type is a market effects evaluation,
15   which characterizes changes in the structure or functioning of a
16   market or the behavior of market participants that resulted from
17   one or more program efforts. Market effects evaluations can
18   include projections of impacts that a market could have on
19   future energy efficiency efforts. **If the evaluation's goal is to**
20   **assess cost-effectiveness for stakeholders or regulators,**
21   **excluding the measurement of market effects could result in**
22   **underestimating (or possibly overestimating) a program's**
23   **overall benefits or cost-effectiveness.**[10]
24

25   **Q.   Based on these facts there should be no question that the inclusion of**

26   **market effects in the NTG calculation is a legitimate, real and even fundamental part of**

27   **the NTG calculation. Do you agree?**

28   A.   Yes. The overall goal of Ameren Missouri energy efficiency goals is to

29   transform specific markets to become more energy efficient. At such time as the

---

[10] SEE Action, *Energy Efficiency Program Impact Evaluation Guide*, December 2012, p. 2-3.

1 transformation is complete, Ameren Missouri would end its efforts in promoting that specific

2 group of programs and measures and move on to the next cost effective frontier to secure

3 more energy efficiency. Metrics to help define the goal of market transformation include:

4   o   Ameren Missouri's efforts leading to new appliance efficiency standards and/or

5   building codes

6   o   Increased levels of awareness of energy efficient technologies among customers
7   and suppliers
8
9   o   Increased availability of efficient technologies through retail channels
10
11   o   Reduced prices of efficient models
12
13   o   Build-out of efficient model lines
14
15   o   Ultimately, the increased market share for efficient goods, services, and design
16   practices
17
18   Consequently, the exclusion of market effects from the NTG calculation will

19 yield net kWh savings for Ameren Missouri DSM programs that are biased in the downward

20 direction. Omission of the calculation of market effects would be an affirmation of the

21 asymmetric view of the NTG ratio where there is only downside potential and minimal

22 upside potential. Omission of market effects would understate the actual annual kWh load

23 reductions attributable to Ameren Missouri's comprehensive DSM marketing and customer

24 information and education on becoming more energy efficient.

25 <center>**V. CONCLUSION**</center>

26 **Q. Please re-state the specific action(s) that Ameren Missouri recommends**

27 **that the Commission take regarding the free ridership estimates in the 2013 EM&V**

28 **reports for a select group of DSM programs.**

1   A.   On the basis of the evidence provided in this testimony, Ameren Missouri

2   recommends the Commission approve the change in estimates of free ridership and the

3   corresponding changes in each program's net kWh achieved in 2013 as summarized in the

4   following table:

	Original Free Ridership	Adjusted Free Ridership	Original Net kWh	Adjusted Net kWh	Difference kWh
ApplianceSavers	39%	22%	5,171,803	6,360,537	1,188,734
CommunitySavers	4%	2%	5,890,076	6,004,832	114,756
ConstructionSavers	72%	72%	67,356	67,356	0
CoolSavers	25%	14%	23,940,658	26,717,884	2,777,226
LightSavers	20%	20%	279,126,792	279,126,792	0
PerformanceSavers	17%	7%	289,957	320,204	30,247
RebateSavers	13%	8%	7,794,733	8,333,747	539,014
Residential Total			322,281,375	326,931,352	4,649,977

5

	Orginal Free Ridership	Adjusted Free Ridership	Original Net kWh	Adjusted Net kWh	Difference kWh
Custom	7.88%	6.54%	43,875,548	44,511,860	636,312
Standard	4.79%	3.98%	23,899,394	24,103,107	203,713
New Const.	6.00%	4.98%	204,121	206,777	2,656
RCx	33.00%	27.39%	223,759	243,707	19,948
Business Total			68,202,822	69,065,451	862,629
Portfolio Total			390,484,197	395,996,803	5,512,606

6

7   **Q.**   **Are the risks and uncertainties around estimates of free ridership**

8   **equivalent to the same around market effects?**

9   A.   No. The risk and uncertainty around estimates of free ridership, when based

10   upon the results of customer self-reporting surveys, is considerably greater than it is for

1   market effects. The reason is that market effects are based, at least partially, on actual

2   quantifiable changes in market shares for energy efficiency measures based on Ameren

3   Missouri primary market research data. Primary data should always take precedence over

4   secondary market research data. Customer self-reporting surveys, on the other hand, attempt

5   to answer the question what "would have happened" by asking a series of hypothetical

6   survey questions to customers. When it comes to the dynamic retail sector, it may be

7   impossible to predict what customers would have done without the utility sponsored DSM

8   program.

9

10   **Q.**   **Is there a specific action(s) that Ameren Missouri recommends that the**

11   **Commission take regarding market effects for 2013 programs?**

12   A.   Ameren Missouri requests that the Commission recognize and approve the

13   legitimate and real impact of market effects and the market effects calculation that Cadmus

14   did for the 2013 residential LightSavers program. Ameren Missouri also requests that the

15   Commission encourage all stakeholders to continue to pursue a balanced approach, which

16   includes market effects, as free as possible of bias, in the calculation of NTG.

17   **Q.**   **What final thoughts do you have for the Commission's consideration?**

18   A.   The degree of accuracy needed in the NTG computation, be it for free

19   ridership, spillover or market effects, should be considered more stringent if financial

20   incentives are involved or if new generation additions are a function of the amount of actual

21   load reductions achieved through DSM programs. The accuracy needed to avoid making a

22   wrong decision should vary directly with the potential dollars associated with that wrong

23   decision. That being said, it may be worthwhile for the Commission to consider establishing

1   policies and procedures governing the determination NTG, including all of its components,

2   for DSM programs.

3   **Q.   Does this conclude your direct testimony?**

4   A.   Yes, it does.

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

AFFIDAVIT OF RICHARD A. VOYTAS

STATE OF MISSOURI   )
) ss
CITY OF ST. LOUIS   )

Richard A. Voytas, being first duly sworn on his oath, states:

1.   My name is Richard A. Voytas. I work in the City of St. Louis, Missouri and I am employed by Ameren Service Company as Director of Energy Efficiency/Demand Response.

2.   Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Union Electric Company d/b/a Ameren Missouri consisting of _33_ pages, and Schedule(s) ___N/A_____, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3.   I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

_____
Richard A. Voytas

Subscribed and sworn to before me this _3rd_ day of ___July_____, 2014.

_____
Notary Public

My commission expires: