

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

Filed
January 6, 2012
Data Center
Missouri Public
Service Commission

In re: Union Electric Company's
2011 Utility Resource Filing pursuant to
4 CSR 240 – Chapter 22.

Case No. EO-2011-0271

AFFIDAVIT OF ADAM BICKFORD

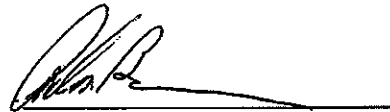
STATE OF MISSOURI

CITY OF JEFFERSON

SS

Adam Bickford, of lawful age, being duly sworn on his oath, deposes and states:

1. My name is Adam Bickford. I work in the City of Jefferson, Missouri, and I am employed by the Missouri Department of Natural Resources' Division of Energy as a Research Analyst.
2. Attached hereto and made a part hereof for all purposes are Highly Confidential and Public versions of my Rebuttal Testimony on behalf of the Missouri Department of Natural Resources' Division of Energy, consisting of twelve pages of testimony and one page of schedules in the Highly Confidential version and twelve pages of testimony and one page of schedules in the Public version, 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 to the best of my knowledge.



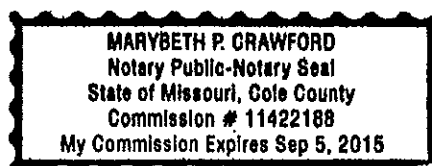
Adam Bickford

Subscribed and sworn to before me this 28th day of October, 2011.


Notary Public MARYBETH P. Crawford

My commission expires:

September 5, 2015



MDNR Exhibit No. 25 NP
Date 12/15/11 Reporter JMB
File No. EO 2011-0271

Exhibit No.:
Issues: Rebuttal to Ameren
Missouri
Witness: Adam Bickford
Sponsoring Party: Missouri Department of
Natural Resources –
Division of Energy
Type of Exhibit: Rebuttal Testimony
Case No.: ER-2011-0271

**REBUTTAL TESTIMONY
OF
ADAM BICKFORD
MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENERGY**

October 28, 2011

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

UNION ELECTRIC COMPANY (dba AMEREN MISSOURI)

INTEGRATED RESOURCE PLANNING CASE

CASE NO. EO-2011-0271

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

2 A. My name is Adam Bickford. My business address is Missouri Department of
3 Natural Resources, Division of Energy, 1011 Riverside Drive, P.O. Box 176,
4 Jefferson City, Missouri 65102-0176.

5

6 **Q. Please describe your educational background and employment**
7 **experience.**

8 A. I began work with the Missouri Department of Natural Resources Energy
9 Center in August, 2009. In my current position I am a Research Analyst. Prior
10 to working with Missouri Department of Natural Resources I was employed as
11 a program evaluator by Optimal Solutions Group, LLC in Hyattsville, Maryland;
12 the University of Missouri Extension Office of Social and Economic Data
13 Analysis in Columbia, Missouri; and the Smithsonian Institution in Washington
14 D.C. In these positions my responsibilities included the design and execution
15 of evaluation projects in the K-12 education and arts domains.

16 I received my B.A. degree in Sociology from the University of California,
17 Berkeley. I hold a Masters of Arts degree and a Doctor of Philosophy degree
18 in Sociology from the University of Chicago.

19

20 **Q. On whose behalf are you testifying?**

21 A. I am testifying on behalf of the Missouri Department of Natural Resources
22 ("MDNR"), an intervenor in these proceedings.

23 **Q. What is the purpose of your rebuttal testimony in these proceedings?**

1 A: The purpose of my testimony is to comment on four issues in Ameren
2 Missouri's February 4, 2011 Integrated Resource Plan (IRP) raised by MDNR
3 in File No. EO-2011-0271. These issues were raised in MDNR's comments
4 on Ameren Missouri's plan filing, submitted to the Commission on June 23,
5 2011 and responded to by Ameren Missouri on August 22, 2011. In its June
6 23, 2011 filing, MDNR raised eleven deficiencies and seven concerns. I wish
7 to comment on one deficiency and three concerns raised by MDNR:

- 8 1. Deficiency #7: "Ameren Missouri did not analyze alternative resource plans
9 containing the 2% savings scenario as required by its agreement with
10 MDNR."¹
- 11 2. Concern #3: "Use of terms that do not appear in the Chapter 22 rules: In
12 selecting its preferred plan, the company relies on several terms that do not
13 appear in Chapter 22. The company does not adequately explain the
14 relationship of these terms to the selection process required in Chapter 22."²
- 15 3. Concern #6: "Sampling issues with the company's DSM Market Potential
16 Study."³
- 17 4. Concern #7: "MDNR is concerned that the measure-level variables that the
18 company used in its market potential study to construct one-year take rates
19 and ultimately to estimate Maximum Achievable Potential were not based
20 on primary data."⁴

¹ Missouri Department of Natural Resources Division of Energy Comments in Response to Ameren Missouri's Integrated Resource Plan Filing File No. EO-2011-0271. June 23, 2011. Page 23.

² Ibid., Page 17.

³ Ibid., Page 32.

⁴ Ibid., Page 32.

1 John Noller, of MDNR, will comment on the remaining deficiencies and
2 concerns addressed in our comments on Ameren Missouri's 2011 IRP filing.

3
4 **Ameren Missouri's Analysis of the 2% DSM portfolio**

5 **Q. Are the issues raised by Deficiency #7 still considered a deficiency?**

6 A. No, Ameren has completed the agreed upon analysis. Deficiency #7 originated
7 in response to a stipulation in the settlement agreement for Ameren Missouri's
8 2010 rate case, ER-2010-0036. As part of this settlement, Ameren Missouri
9 agreed to test two specific DSM portfolios "that annually achieve incremental
10 electric energy and demand savings equivalent to (A) 1% (by 2015) and (B) 2%
11 (by 2020) reductions in annual sales."⁵

12 Both MDNR's comments and Ameren Missouri's reply describe the
13 series of presentations and negotiations that led to the creation of the particular
14 1% and 2% portfolios. After the joint analysis by Ameren Missouri and MDNR,
15 both parties agreed that the 1% portfolio was similar to Ameren Missouri's
16 Maximum Achievable Potential (MAP) savings portfolio and submitting the
17 MAP portfolio to integration would satisfy the first part of the stipulation in ER-
18 2010-0036.

19 Satisfaction of the 2% portfolio stipulation has been more contentious.
20 The essential points of MDNR and Ameren Missouri's negotiations are
21 described in each party's comments. At the time MDNR filed its initial
22 comments, MDNR had not been able to locate all of the 2% portfolio files in

⁵ AmerenUE *First Nonunanimous Stipulation And Agreement*, File No. ER-2010-0036, March 24, 2010. Paragraph 12.

1 Ameren Missouri's work papers. After MDNR's filing, we located the screening
2 work papers (which test the measures included in the 2% portfolio) and the
3 integration work papers (which compare the NVPRR values of the 2% portfolio
4 against Ameren Missouri's Realistic Achievable Potential [RAP] portfolio) for
5 the 2% portfolio. MDNR notes that these work papers were stored in two
6 separate locations on the Work Paper disk. MDNR was made aware of the
7 screening work papers by Ameren Missouri personnel, but was not aware of
8 the integration work papers until after reviewing Ameren Missouri's August 22
9 response ("Ameren Response.") Based on the contents of these two sets of
10 work papers, MDNR concludes that Ameren Missouri has completed the
11 agreed upon analysis.

12 **Q. Does MDNR still have concerns regarding this Portfolio?**

13 **A:** Yes, Ameren used non-cost effective measures to achieve 2% savings and it
14 appears that its Potential Study is flawed. These had a significant effect on its
15 selection of resource plans. In its response to MDNR's comments, Ameren
16 Missouri claimed that the 2% portfolio would "not be selected as a candidate
17 resource plan... because of its poor TRC..."⁶

⁶ Ibid. Page 31.

MDNR agrees that the calculated TRC for the 2% portfolio, as confirmed in the screening work papers, is **■■■■■**, indicating that the costs to implement the measures in the 2% portfolio are approximately twice the benefits that ratepayers would receive from the programs. This value led MDNR to examine the way the 2% scenario was constructed.

DSM portfolios achieve different savings levels through a combination of measures offered and participation rates. For a set of measures, different participation rates will lead to different levels of savings. The opposite is also true, for a given number of participants, a desired savings level can be achieved by manipulating the number and type of measures offered.

MDNR's further analysis of the 2% portfolio suggests that Ameren Missouri has taken the second approach to achieve the 2% savings level. Ameren Missouri listed **■■■■■** measures in the eleven programs in its screening work papers for the 2% portfolio. Of these measures, **■■■■■ ■■■■■** had TRC values less than 1.0 (see Schedule A). It appears that Ameren Missouri's construction of the 2% portfolio is filled with measures that are not cost effective, and this is one cause preventing the overall portfolio to have a TRC value less than 1.0.

The table in A suggests another way to achieve the 2% savings. Over twenty years, the cost-effective measures in its portfolio save approximately **18 percent** of the energy saved by the complete portfolio. If Ameren Missouri were to focus exclusively on the cost-effective measures it could

reach a level of savings equal to the agreed upon 2% of incremental sales by increasing the number of participants by a factor of **■**.

However, understanding the likelihood of achieving a savings goal by increasing the number of participants requires an estimate of the number of customers likely to participate in a DSM program. Such estimates are developed through a potential study. Given Ameren Missouri's 2009 DSM Potential Study⁷, which presents a conservative estimate of the number of program participants Ameren Missouri could expect from its suite of energy efficiency measures, one would expect that the company would seek to meet the aggressive 2% savings goal through adding measures. However, adding non-cost effective measures to a portfolio, in order to meet a savings goal, raises questions about the participation estimates in Ameren Missouri's potential study.

Concerns about Ameren Missouri's use of non-standard terms in its plan filing

Q. Please describe the issues raised by MDNR Concern #3.

A. Concern #3 outlines Ameren Missouri's use of non-standard terminology in its plan. Several of the terms that Ameren Missouri used in its IRP are not part of the IRP rules. In reviewing the plan documents, MDNR had to make assumptions about what these non-standard terms referred to. In at least one situation, the use of non-standard terms has allowed Ameren Missouri to

⁷ AmerenUE Demand Side Management (DSM) Market Potential Study Global Energy Partners, LLC. Walnut Creek, CA. 2010. 1287-1.

1 circumvent the rules governing the use of “critical uncertain factors” in selection
2 of its preferred plan.

3 Specifically, Ameren Missouri uses several non-standard terms in its
4 plan selection process, which required the plan reviewers, such as MDNR, to
5 map these terms onto the standard terms. The non-standard terms and the
6 standard terms they apparently refer to are listed in MDNR’s comments:

- 7 • “decision factors,” which apparently are similar to “critical
8 uncertain factors;
- 9 • “policy objectives,” which apparently are similar to “planning
10 objectives”;
- 11 • “decision criteria,” which apparently are similar to “selection
12 criterion” and “performance measures.”⁸

13 MDNR has two concerns, first that the relationship between the non-
14 standard terms that Ameren Missouri uses and the standard terms in the rule
15 are not made explicit, and, second that the use of the “decision factor” term
16 circumvents the requirements for the use of critical uncertain factors in the rule.

17
18 **Q. Why is the use of non-standard terms in Ameren Missouri’s plan filing**
19 **problematic?**

20 A. The definition of terms matter. By using non-standard terms to describe parts
21 of the planning process previously defined in the rule, Ameren Missouri
22 confuses the process. In addition, Ameren Missouri did not provide a clear set
23 of definitions that allow reviewers of the plan to know what these non-standard

1 terms refer to. Based on a review of the plan filing, MDNR proposed a
2 relationship between Ameren Missouri's non-standard terms and the terms in
3 the rule, but these are MDNR's assumptions. The Ameren Response, states:

4 DNR correctly likens the term "policy objectives" to the term "planning
5 objectives" which is defined in the rules, and the term "decision criteria" to
6 "selection criteria", also defined in the rules.⁹
7

8 However, these are MDNR's assumptions about the meaning of Ameren
9 Missouri's terms. In our comments MDNR requested explicit definitions of the
10 no-standard terms Ameren Missouri used:

11 In a supplemental filing, the company should define "policy objective,"
12 explain the relationship of "policy objectives" to "planning objectives" and
13 either state that rule requirements that apply to planning objectives also
14 apply to policy objectives or explain why they should not apply. In a
15 supplemental filing, the company should define "decision criteria," explain
16 the relationship of "decision criteria" to "decision factors," "performance
17 measures" and "selection criteria" and either state that rule requirements
18 that apply to selection criteria also apply to decision criteria or explain why
19 they should not apply.¹⁰
20

21 **Q. Are there additional issues regarding Ameren Missouri's use of non-**
22 **standard terms?**

23 A. Yes. MDNR is concerned that Ameren Missouri's use of "decision factors"
24 instead of the standard "critical uncertain factors" circumvents the required
25 analysis of critical uncertain factors in a contingency analysis. This issue is
26 discussed at length in John Noller's testimony describing MDNR Deficiency #2.
27 It appears to MDNR that Ameren Missouri has employed the non-standard

⁸ Ibid., Page 17.

⁹ Response to Comments of Parties Ameren Missouri – 2011 Integrated Resource Plan, August 22, 2011. Page 93-94.

¹⁰ Missouri Department of Natural Resources Division of Energy Comments in Response to Ameren Missouri's Integrated Resource Plan Filing File No. EO-2011-0271. June 23, 2011. Page 17-18.

1 “decision factors” to avoid submitting its plans to a conventional contingency
2 analysis. In comments on its preferred plan selection, Ameren Missouri notes
3 that there are “no values of uncertain factors that would cause the Company to
4 select a different plan as the preferred plan.”¹¹ This position seems to be at
5 odds with the intent of 4 CSR 240-22.010(2)(C)(1) and 4 CSR 240-22.070(2).

6 MDNR maintains that Ameren Missouri’s use of “decision factors”,
7 especially decision factors that preclude changes in the selection of a preferred
8 plan, are opposed to the goals of integrated resource planning. Such plans
9 should specify both a preferred plan and the circumstances where this plan
10 would be expected to change. According to Ameren Missouri, there are no
11 circumstances where the preferred plan filed in February, 2011 would be
12 changed. To MDNR, such a claim is improbable. The factors that can impact
13 Ameren Missouri’s future performance remain, despite its decision not to
14 analyze them.

15
16 **Two concerns about Ameren’s DSM Potential Study**

17 **Q. What are the issues raised by Concerns #6 and #7?**

18 A. Both of these issues concern Ameren Missouri’s 2009 DSM Potential Study.
19 Previously, MDNR presented a comprehensive methodological critique of the
20 study. We do not intend to re-visit the details of that critique in discussing
21 Concerns #6 and #7. However, these concerns are intended as steps Ameren
22 Missouri should consider when conducting its next potential study.

¹¹ *Response to Comments of Parties Ameren Missouri – 2011 Integrated Resource Plan*, August 22, 2011.
Page 92

1 Concern #6 addresses the sampling methodology in Ameren Missouri's
2 current potential study. That study was based on a quota sample, which,
3 among other things, prevents calculation of estimates of the sample standard
4 error around the study's various potential estimates. Because of the choice of
5 sample, it is not possible to assess the accuracy of Ameren Missouri's potential
6 estimates. Additionally, it was not possible to adjust the sample estimates to
7 account for imperfections in the sample design. In Concern #6, MDNR
8 encourages Ameren Missouri to use a more standard sampling methodology, a
9 stratified random sample, in its future studies. Such a design will provide
10 Ameren Missouri with a much more robust data set to use in its DSM program
11 planning.

12 Concern #7 highlights a problem with the instrument used in Ameren
13 Missouri's potential study. The adoption rates for measures used to estimate
14 the Maximum Achievable Potential (MAP) savings were constructed from other
15 data in the survey rather than measured directly. In MDNR's opinion, measure
16 adoption rates (referred to as "take rates" in the potential study) are too
17 important to be estimated by an algorithm, regardless of how valid the
18 algorithm appears. MDNR encourages Ameren Missouri to develop survey
19 instruments that allow for the direct measurement of essential data elements,
20 such as the adoption rate of efficiency measures.

21 **Q. What is Ameren Missouri's response to these concerns?**

1 A. With respect to Concern #6, Ameren Missouri cites the MEEIA rules regarding
2 the conduct of potential studies,¹² and insists that it “has already used
3 stratified-random sampling and will likely continue to use stratified random
4 sampling in data collection for its next full demand-side potential study.”¹³

5 MDNR is encouraged by Ameren Missouri’s commitment to adhere to
6 the MEEIA rules and looks forward to its use of a stratified random sampling
7 methodology in its future potential studies. However, MDNR does not agree
8 with Ameren Missouri’s assertion that its current potential study is based on a
9 stratified random sample. However, MDNR also notes that, at this date,
10 Ameren Missouri’s current potential study is two years old and any additional
11 debate about the conduct of the design and execution of this study will not yield
12 positive results.

13 With respect to its response to Concern #7, Ameren Missouri asserts
14 that its “data collection was well-designed and sufficient”¹⁴, citing that the
15 choice to omit questions asking about measure adoption under a MAP
16 scenario was made “[t]o reduce survey fatigue and research budget.”¹⁵ Their
17 explanation does not change the fact that questions about the adoption of an
18 entire range of measures under a “one-year payback scenario” were not asked
19 and responses to essential measures were estimated. The omission of these
20 items raises questions about the validity of Ameren Missouri’s MAP savings
21 scenario. However, as with Concern #6, the time to address these questions

¹² See 4 CSR 240-3.164(2)(A).

¹³ *Response to Comments of Parties Ameren Missouri – 2011 Integrated Resource Plan*, August 22, 2011.
Page 37

¹⁴ *Ibid.*, Page 38.

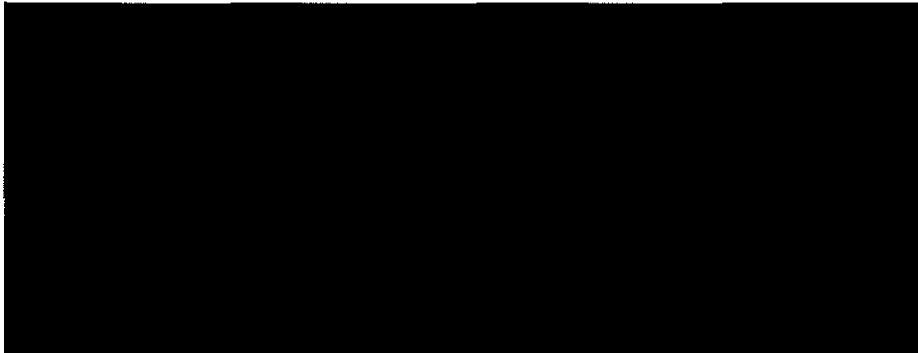
¹⁵ *Ibid.*, Page 38.

1 has passed. MDNR looks forward to working with Ameren Missouri on its
2 future market potential studies.

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

4 A. Yes. Thank you.

Schedule A: Comparative values from Ameren Missouri's 2% Portfolio
(Highly Confidential in its entirety.)



Source: Ameren Missouri "2 percent" Portfolio Screen Work Papers

These estimates were calculated from the set of DSMore program-level "BatchTool" files provided by Ameren Missouri in their work papers. These files contain measure-level TRC values, measure cost and benefit values, and 20-year energy and demand savings values. MDNR summarized these values from the 11 BatchTool files to develop the values in this table. See the attached work paper document, "EO-2011-0271 Bickford Rebuttal Work Papers.xls", for detailed calculations.