Exhibit No.:	
Issue:	Net Fuel Cost
Witness:	Brian C. Andrews
Type of Exhibit:	Direct Testimony
Sponsoring Party:	Missouri Industrial Energy Consumers
Case No.:	ER-2014-0258
Date Testimony Prepared:	December 5, 2014

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company, d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service	)))))	**Case No. ER-2014-0258**

Direct Testimony and Schedules of

Brian C. Andrews

Regarding Net Fuel Cost

On behalf of

Missouri Industrial Energy Consumers

NON-PROPRIETARY VERSION

December 5, 2014

BRUBAKER & ASSOCIATES, INC.

Project 9913

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company, d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service	)))))	**Case No. ER-2014-0258**

STATE OF MISSOURI)
) **SS**
COUNTY OF ST. LOUIS)

Affidavit of Brian C. Andrews

Brian C. Andrews, being first duly sworn, on his oath states:

1. My name is Brian C. Andrews. I am an associate consultant with Brubaker & Associates, Inc., having its principal place of business at 16690 Swingley Ridge Road, Suite 140, Chesterfield, Missouri 63017. We have been retained by the Missouri Industrial Energy Consumers in this proceeding on their behalf.

2. Attached hereto and made a part hereof for all purposes are my direct testimony and schedules which were prepared in written form for introduction into evidence in Missouri Public Service Commission Case No. ER-2014-0258.

3. I hereby swear and affirm that the testimony and schedules are true and correct and that they show the matters and things that they purport to show.

Brian C. Andrews

Subscribed and sworn to before me this 4th day of December, 2014.

MARIA E. DECKER
Notary Public - Notary Seal
STATE OF MISSOURI
St. Louis City
My Commission Expires: May 5, 2017
Commission # 13706793

Notary Public

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Direct Testimony of Brian C. Andrews

I. INTRODUCTION

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Brian C. Andrews. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q WHAT IS YOUR OCCUPATION?

A I am an Associate Consultant with the firm of Brubaker & Associates, Inc. ("BAI" or "We"), energy, economic and regulatory consultants.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information is included in Appendix A.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A This testimony is presented on behalf of the Missouri Industrial Energy Consumers ("MIEC"). Member companies purchase substantial amounts of electric service from Union Electric Company ("Ameren Missouri" or "Company").

Q PLEASE DESCRIBE YOUR INVOLVEMENT WITH AMEREN MISSOURI'S PAST BASE RATE CASES.

A Under the direction and supervision of my colleague, Nicholas L. Phillips, in Case No. ER-2012-0166, I performed RealTime™ production cost simulations and other analyses in support of Mr. Phillips' testimony regarding Ameren Missouri's Net Base Energy Cost ("NBEC"). In this proceeding, I am sponsoring testimony on the *Net Fuel Cost* component of Ameren Missouri's NBEC. Mr. Phillips will be separately sponsoring testimony on the *Other Fuel and Purchased Power Costs* and *Other Sales Revenues* components of Ameren Missouri's NBEC.

Q WHAT IS THE SUBJECT OF YOUR TESTIMONY?

A My testimony addresses the Net Fuel Cost that Ameren Missouri proposes to include as a part of its NBEC and ultimately include in its revenue requirement. Specifically, I have updated the assumptions for fuel prices and market prices used in Ameren Missouri's normalized test year production cost modeling, based on more current information.

The fact that I do not address a particular issue should not be interpreted as approval of any position taken by Ameren Missouri.

Q PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A I recommend that the Missouri Public Service Commission ("Commission" or "MPSC") reduce Ameren Missouri's Net Fuel Cost by $6.4 million. This $6.4 million reduction is due to my proposed updates to the fuel prices and market prices. As a result of this reduction, Ameren Missouri's Net Fuel Cost should be $667.3 million.

II. NET FUEL COST

Q PLEASE EXPLAIN THE TERM NET FUEL COST.

A Ameren Missouri's Net Fuel Cost consists of fuel and purchased power costs for native load and off-system sales ("OSS") of energy less revenues from OSS of energy, as estimated using production cost modeling.

Q WHAT STANDARD SHOULD THE COMMISSION USE TO SET AMEREN MISSOURI'S NET FUEL COST COMPONENT OF AMEREN MISSOURI'S REVENUE REQUIREMENT?

A It should be set on the same standard as the remainder of Ameren Missouri's NBEC and ultimately Ameren Missouri's revenue requirement. Specifically, it should be set in this proceeding based on Ameren Missouri's actual costs during the historic test year ending March 30, 2014 adjusted as necessary for known and measurable changes from the true-up period that ends December 31, 2014, annualized for periodic expenses and normalized to address abnormalities such as annual swings in weather and commodity market prices.

Q WHAT IS THE TOTAL ANNUAL NET FUEL COST THAT AMEREN MISSOURI PROPOSED IN THIS PROCEEDING?

A Ameren Missouri proposed a Net Fuel Cost of approximately $673.7 million. This consists of Fuel Costs of approximately $854.2 million plus Purchased Power Costs of approximately $34 million less revenues from OSS of energy of approximately $214.5 million (Direct Testimony of Mark Peters, page 2).

Q PLEASE DESCRIBE YOUR REVIEW OF AMEREN MISSOURI'S PROPOSED NET FUEL COST AMOUNT.

A I reviewed the direct testimony and schedules of Ameren Missouri witnesses Mark Peters and Jaime Haro in regard to Net Fuel Cost. I also reviewed Ameren Missouri's responses to data requests in this proceeding that relate to this issue. As discussed later in this testimony, we developed a working version of a production cost model database for the Ameren Missouri system using the RealTime™ production cost software. The development of this production cost model allowed me to use the RealTime™ production cost software to calculate the estimated impact on Net Fuel Cost from updating the inputs Ameren Missouri used in its own PROSYM production cost modeling. Finally, I applied my experience to the information available in considering the reasonableness of Ameren Missouri's proposed Net Fuel Cost amount.

Q HAS AMEREN MISSOURI INTRODUCED ANY SIGNIFICANT CHANGES TO THE OPERATIONAL DATA ASSUMPTIONS THAT WERE USED IN THE LAST RATE CASE?

A Yes. As Mr. Peters states on page 6 of his direct testimony, there have been three significant changes. The first is that the Meramec Energy Center will have its commitment status changed from must-run to economic dispatch. This change allows the model to commit and de-commit these units based on the economics. In doing this, Mr. Peters had to adjust the minimum up and down times such that the number of starts per year would not exceed 30.

Second, the O'Fallon Solar Energy Center has been included as a generating resource. It is my understanding the solar energy farm will be in service by the end of 2014.

Lastly, the fuel blend at the Sioux Energy Center has been changed to 100% Powder River Basin coal, in anticipation of this operational change occurring.

Q DO YOU BELIEVE THAT THESE CHANGES TO OPERATIONAL DATA ASSUMPTIONS ARE REASONABLE TO INCLUDE IN THE PRODUCTION COST MODEL?

A Yes. However, I recommend that these changes be monitored to make sure they have all been implemented by the end of the true-up period.

III. NET FUEL COST – PRODUCTION COST MODELING

Q PLEASE EXPLAIN WHAT PRODUCTION COST MODELING IS AND HOW IT IS BEING USED IN THIS PROCEEDING.

A As Mr. Peters indicated in his direct testimony, production cost modeling allows the simulation of an electric utility's generation system and load obligations. The costs for fuel, heat rates of generators, hourly market prices, generation outage assumptions, hourly loads and many other items are inputs to the model. The model then performs a commitment and dispatch of generation to meet hourly load obligations. In addition, the model makes use of the hourly market prices and forward contracts that are inputs to the model to estimate hourly off-system energy purchases and sales. In this proceeding, Ameren Missouri is using production cost modeling to estimate its Net Fuel Cost using normalized loads and market prices.

Q PLEASE DESCRIBE THE REALTIME™ PRODUCTION COST MODEL AND HOW YOU HAVE USED IT IN THIS PROCEEDING.

A RealTime™ is a production cost software package similar to the PROSYM production cost software package used by Ameren Missouri. Both RealTime™ and PROSYM are competent models for estimating utility production cost. In Case No. ER-2012-0166, both the Commission Staff and MIEC utilized RealTime™ to estimate Ameren Missouri's Net Fuel Cost. Furthermore, I understand that the Commission Staff is also utilizing RealTime™ to determine the Company's Net Fuel Cost in this proceeding.

In this proceeding, I used the RealTime™ software to estimate how Ameren Missouri's proposed Net Fuel Cost will change when I update certain assumptions made by Ameren Missouri.

Q WHAT HAS BEEN DONE IN THIS PROCEEDING TO ENSURE THE REALTIME™ MODEL PROVIDES RESULTS SIMILAR TO THOSE WHICH WOULD BE PROVIDED BY THE PROSYM MODEL?

A I developed a RealTime™ model database using the inputs that Ameren Missouri used for its normalized test year Net Fuel Cost PROSYM model runs in this proceeding. This RealTime™ case, which I will refer to as the "BAI Benchmark Case," projected a Net Fuel Cost within $3.5 million (0.5%) of the Net Fuel Cost projected by Ameren Missouri through its PROSYM run for the normalized test year in this proceeding.

Q PLEASE EXPLAIN THE DEVELOPMENT OF THE "BAI BENCHMARK CASE" THAT WAS USED TO COMPARE THE RESULTS OF THE REALTIME™ PRODUCTION COST SIMULATION MODEL TO THE RESULTS OF THE PROSYM PRODUCTION COST SIMULATION MODEL.

A I started with the Benchmark production cost model database for RealTime™ that was developed in Case No. ER-2012-0166. I then modified the inputs to that database to match, as closely as possible, the inputs that Ameren Missouri used in its normalized test year PROSYM run. This was achieved by reviewing workpapers of Mr. Peters, workpapers of Mr. Haro and Ameren Missouri's responses to data requests in this proceeding.

Q CAN YOU PLEASE DETAIL HOW THE RESULTS OF THE BAI BENCHMARK CASE COMPARE TO THAT OF THE NORMALIZED TEST YEAR PROSYM PRODUCTION COST MODEL RUN PRESENTED BY AMEREN MISSOURI IN ITS DIRECT TESTIMONY?

A Yes. As detailed in NP Schedule BCA-1, the results of the BAI Benchmark Case yielded a Net Fuel Cost of $677.222 million versus the $673.686 million Net Fuel Cost yielded from the Ameren Missouri normalized test year PROSYM production cost model run. Thus, in aggregate, the BAI Benchmark Case results are within approximately $3.537 million (or 0.52%) of the Ameren Missouri normalized test year PROSYM run. In addition, as detailed in NP Schedule BCA-2, the annual MWh of energy production at each of Ameren Missouri's nuclear, coal and hydroelectric stations in the BAI Benchmark Case is very close to the output for these stations in Ameren Missouri's normalized test year PROSYM run (all differ by less than 6.4%). Furthermore, Ameren Missouri's annual OSS of energy MWh in the BAI Benchmark

Case is within 4.9% of the level in Ameren Missouri's normalized test year PROSYM run. The only notable differences between the BAI Benchmark Case and Ameren Missouri's normalized test year PROSYM run relate to combustion turbine generation and purchased power. The BAI Benchmark Case has **_____** more combustion turbine energy production than the Ameren Missouri normalized test year PROSYM run and **_____** more purchased power. However, these differences do not have a significant impact on the calculation of Net Fuel Cost since Net Fuel Cost in the aggregate is within 0.52% of the Ameren Missouri normalized test year PROSYM run.

Q WHAT DO YOU CONCLUDE REGARDING THE BENCHMARKING ANALYSIS OF REALTIME™ THAT YOU PERFORMED?

A When utilizing the same inputs as Ameren Missouri, the RealTime™ program provides Net Fuel Cost results very similar to that of the PROSYM program used by Ameren Missouri. As such, RealTime™ can be utilized to calculate the impact that my proposed updates to the input assumptions used by the Company will have on Ameren Missouri's Net Fuel Cost.

IV. UPDATED ASSUMPTIONS USED IN PRODUCTION COST MODEL

Q AFTER BENCHMARKING TO AMEREN MISSOURI'S NORMALIZED TEST YEAR PRODUCTION COST RUN, DID YOU UPDATE ANY ASSUMPTIONS MADE BY THE COMPANY TO REFLECT MORE CURRENT INFORMATION?

A Yes. In particular, I updated the normalized wholesale electric energy prices and the fuel price assumptions used by the Company in its normalized test year production

cost run. I intend to further monitor and update these known and measurable input assumptions as necessary through the end of the December 31, 2014 true-up period.

Q PLEASE DESCRIBE IN DETAIL HOW YOU UPDATED THE WHOLESALE ELECTRIC ENERGY PRICES USED IN THE NORMALIZED TEST YEAR PRODUCTION COST RUN.

A As Mr. Haro indicates on pages 7 and 8 of his direct testimony, the normalized wholesale electric energy prices used in the normalized test year production cost run are developed using 36 months of day-ahead locational marginal prices ("LMPs") experienced by Ameren Missouri in the Midcontinent Independent System Operator, Inc. ("MISO") energy market at its generation nodes. At the time of its filing, the Company used 28 months of historical data, plus basis-adjusted forward energy prices for eight months. I would also note that Ameren Missouri made an adjustment to the calculation of the 36-month average to exclude the prices during the months of the "polar vortex anomaly" period (January through March 2014). The average prices for January, February and March are in reality averages that only include data from 2012 and 2013. For the purposes of this update, I used a similar methodology to the one presented in Mr. Peters' workpaper titled, "UE_DIR-UE_DIR_009-Att-Peters - 15-Historical LMPs - PV Adjusted-HC.xlsx".

This methodology uses the generation in each hour to produce an hourly Company-wide LMP value that is weighted by the generation in that hour. I calculated these LMPs through October 31, 2014. I relied on the actual day-ahead output and revenue received at each generating unit for every hour from January 1, 2012 through October 31, 2014, which is data we have access to through

our involvement in previous Ameren Missouri rate cases.[1] The results of my calculations and those used by Mr. Peters are identical for the overlapping period January 1, 2012 through March 31, 2014.

I also updated the remaining two months of basis-adjusted forward energy prices to reflect forward energy prices for November and December 2014 using New York Mercantile Exchange ("NYMEX") forward prices from November 18, 2014. These forward prices were then compared to the forward prices on April 30, 2014. The forward prices from April 30, 2014 were used as a proxy for the forward prices that Mr. Peters included in his workpaper. This comparison yielded both on-peak and off-peak ratios for each month to apply to the hourly prices utilized in Mr. Peters' workpaper for November and December 2014. Applying these ratios to the hourly forward prices in November and December 2014 has effectively updated these prices to reflect the more recent forward market. Note that these forward prices are only being used as a temporary proxy for historical prices and will be replaced with historical prices through the end of the true-up period once those prices are known.

After I updated actual LMPs through October 31, 2014 and updated the forward prices for November and December 2014, I averaged these prices into monthly on-peak and off-peak values, while making the same polar vortex adjustment as Mr. Peters. These average prices were then incorporated into Mr. Peters' workpaper titled "UE_DIR-UE_DIR.009-Att-Peters-6-Loads and DALMP Hourly Apr2013-Mar2014May2014Run PolarV – HC.xlsx" to create hourly market prices to use in the production cost model. The result of my update was an Around-the-Clock

[1]This data is provided to MIEC through a combination of data request responses and non-unanimous stipulations in Case Nos. ER-2010-0036 and ER-2011-0028, which contain Ameren Missouri's monthly 4 CSR 240-3.190 data submittals.

("ATC") wholesale electric energy price of $25.48 per MWh, a reduction of $0.05 per MWh from the level calculated by the Company.

Q PLEASE DESCRIBE IN DETAIL HOW YOU UPDATED THE FUEL COMMODITY AND TRANSPORTATION PRICES USED IN THE NORMALIZED TEST YEAR PRODUCTION COST RUN.

A Similar to the wholesale electric energy prices, the fuel commodity and transportation prices used by the Company in its normalized test year production cost run included both historical and forecasted prices.

For both fuel oil and natural gas, a single monthly price was used (each commodity), for both dispatch and accounting costs in the production cost model. The normalized prices used for these commodities will ultimately be based on historical spot prices for 36 months ending December 31, 2014.

The natural gas prices the Company used in its original normalized test year production cost run included nine months of basis-adjusted forward prices for those months where historical spot prices were not yet available. I updated the monthly natural gas prices with the actual monthly averages though November 2014. This data is reported by the Energy Information Agency, which is the same source the Company uses. I would note that Mr. Peters utilized the wrong prices for May and June 2012 in his workpaper. I have corrected this minor error in my update. I also updated the remaining month of natural gas prices to reflect forward natural gas prices for December 2014 using forward prices for Henry Hub from the last trading day in November and applied a basis differential[2] to account for a difference in

[2]The basis differential is derived from Mr. Peters' workpaper "UE_DIR-UE_DIR_009-Att-Peters - 3-Reference Table MPSC2014 Jan-2012 thru Dec-2014 with 2015 avg coal - HC.xlsx".

delivery location. Again, forward prices are only being used as a temporary proxy for historical prices until complete historical information is available. Furthermore, as discussed by Mr. Phillips in his direct testimony, in order to remove the "polar vortex anomaly" from the 36-month average prices, January through March 2014 prices have been replaced by an average of the corresponding months in 2012 and 2013. This method yields the same result as the adjustment performed for market prices.

Fuel oil prices were updated through June 2014 using the prices provided in the Company's response to MPSC Staff Data Request 0105, found in the file "MPSC_1 MPSC_0105___Kevin_Thompson-Att-MPSC 0105 - Oil Costs - HC.xlsx".

The adjustment for coal prices is more complex than that for natural gas and fuel oil because there are two sets of coal prices used in the production cost model, dispatch prices and accounting prices.

Q PLEASE DESCRIBE THE DIFFERENCE BETWEEN A DISPATCH PRICE AND AN ACCOUNTING PRICE IN THE CONTEXT OF THE PRODUCTION COST MODEL.

A "Dispatch" fuel prices are used internally within production costing software to determine the economic dispatch of the generators and, in turn, the amount of coal burned at each generation facility. Dispatch coal prices are based on monthly spot prices for coal, as opposed to the actual or projected contracted coal prices.

After the software calculates the volume of coal burned at each generation facility based on the dispatch coal prices, Ameren Missouri's actual cost is calculated by multiplying the accounting coal price (i.e., Ameren Missouri's actual or projected contract price for the coal) by the volume of coal burned.

Q PLEASE DESCRIBE HOW YOU UPDATED THE ACCOUNTING COAL COMMODITY AND TRANSPORTATION PRICES USED IN THE NORMALIZED TEST YEAR PRODUCTION COST RUN.

A Using the data provided by the Company's response to MPSC Staff Data Request 0090 and MPSC Staff's response to MIEC Data Request 2.1, I developed accounting coal prices that reflect the historical contracted costs incurred by Ameren Missouri for the 12-month period ending March 31, 2014. The methodology I used was consistent with the methodology that we used when performing the fuel run used in Case No. ER-2012-0166. The result is an annualized effective accounting price for coal at each Ameren Missouri coal-fired generating facility.

Q PLEASE DESCRIBE IN DETAIL HOW YOU UPDATED THE DISPATCH COAL COMMODITY AND TRANSPORTATION PRICES USED IN THE NORMALIZED TEST YEAR PRODUCTION COST RUN.

A The coal dispatch prices used in the normalized test year production cost run are based on 36 months of spot prices for coal commodity and current coal transportation costs. The coal dispatch prices the Company used in its original normalized test year production cost run included eight months of forward coal prices. Similar to the update of the wholesale electric energy prices and natural gas prices, I updated the forward coal prices through November 2014 with the average of the weekly prompt quarter prices reported by SNL.[3] I also updated the remaining forward month (December 2014) with the forward coal data provided in the Company's response to Data Request MIEC 12.8. I then converted all per ton costs into per MMBtu costs,

[3]In Case No. ER-2012-0166, Ameren Missouri provided the spot coal prices utilized in the coal price update. At this time, the Company has objected to MIEC Data Request 12.7, which sought this data. If the Company does provide this data later, I will replace the SNL data with data provided by Ameren Missouri.

added the current transportation component calculated for the accounting coal prices as well as the NO_x, SO_2 and limestone adders used by the Company in its calculation of dispatch coal costs found in Mr. Peters' workpaper "UE_DIR-UE_DIR_009-Att-Peters - 3-Reference Table MPSC2014 Jan-2012 thru Dec-2014 with 2015 avg coal - HC.xlsx". I propose to monitor and update these prices as necessary as more current data becomes available.

Q HAVE YOU BEEN PROVIDED WITH ANY ADDITIONAL UPDATED INFORMATION REGARDING INPUTS USED IN THE PRODUCTION COST MODEL?

A Yes. In the Company's response to MIEC Data Request 12.9, the Company provided the file, "MIEC_12-MIEC_12_9___Diana_Vuylsteke-Att-MIEC 12.9_UE Events for EUOR Apr2008-Sep2014_HC.xlsx", which is an update to Mr. Peters' workpaper titled,"UE_DIR-UE_DIR_009-Att-Peters - 9-UE Events for EUOR Apr2008-Mar2014 - HC.xlsx". There is data contained in this file that would allow for updates to both the forced outage rates and planned outage durations for the nuclear and coal plants based on the six-year period ending September 30, 2014. At this time, I am continuing to analyze this updated data, and am not making a recommendation regarding the forced outage rates and the planned outage duration of Ameren Missouri's nuclear and coal plants used in developing its normalized fuel cost.

Q HAVE YOU RERUN YOUR PRODUCTION COST MODEL FOR THE NORMALIZED TEST YEAR USING THE UPDATED WHOLESALE ELECTRIC ENERGY PRICES AND UPDATED FUEL COMMODITY AND TRANSPORTATION PRICES?

A Yes. The RealTime™ production cost run of this update, which is summarized in Schedule BCA-3, reduced the BAI benchmark case Net Fuel Cost by approximately

$6.4 million. I, therefore, recommend Ameren Missouri's Net Fuel Cost be $667.3 million.

V. CONCLUSIONS AND RECOMMENDATIONS

Q PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A I recommend that the Commission reduce Ameren Missouri's Net Fuel Cost by $6.4 million. This $6.4 million reduction is due to my proposed updates to the fuel prices and market prices. As a result of this reduction, Ameren Missouri's Net Fuel Cost should be $667.3 million.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes.

Qualifications of Brian C. Andrews

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Brian C. Andrews. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q PLEASE STATE YOUR OCCUPATION.

A I am an Associate Consultant in the field of public utility regulation with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EMPLOYMENT EXPERIENCE.

A I received a Bachelor of Science Degree in Electrical Engineering from the Washington University in St. Louis/University of Missouri - St. Louis Joint Engineering Program. I am currently pursuing a Master of Science Degree in Applied Economics from Georgia Southern University.

I have attended multiple training seminars on topics including cost of service, power risk analysis, production cost modeling, cost-estimation for transmission projects, transmission line siting, MISO load serving entity fundamentals and more.

Additionally, I am a certified Engineer Intern in the State of Missouri, and I am a member of the Society of Depreciation Professionals.

In January 2012, I accepted the position of Engineer Intern with BAI. Upon graduation, in May 2012, I was offered the position of Assistant Engineer. In January 2014, I was promoted to Associate Consultant. At BAI, I have been involved with several regulated and competitive electric service issues. These have included book

depreciation, fuel and purchased power cost, transmission planning, resource planning including renewable portfolio standards compliance, electric price forecasting, cost of service, power procurement, and rate design. This has involved use of power flow, production cost, cost of service, and various other analysis and modeling to address these issues, utilizing, but not limited to, various programs such as STRATEGIST, RealTime™, PSS/E, MatLab, R Studio and ArcGIS. Additionally, I have received extensive training on the PLEXOS Integrated Energy Model.

BAI provides consulting services in the economic, technical, accounting, and financial aspects of public utility rates and in the acquisition of utility and energy services through RFPs and negotiations, in both regulated and unregulated markets. Our clients include large industrial and institutional customers, some utilities and, on occasion, state regulatory agencies. We also prepare special studies and reports, forecasts, surveys and siting studies, and present seminars on utility-related issues.

In general, we are engaged in energy and regulatory consulting, economic analysis and contract negotiation. In addition to our main office in St. Louis, the firm also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

Non-Proprietary

Case No. ER-2014-0258

Comparison of BAI Benchmark Case to Ameren Missouri Normalized Test Year Production Cost Run

All Numbers are in Dollars

Plant	Source	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Callaway	Prosym													
	BAI													
	BAI -Prosym													
Labadie	Prosym													
	BAI													
	BAI -Prosym													
Meramec	Prosym													
	BAI													
	BAI -Prosym													
Rush Island	Prosym													
	BAI													
	BAI -Prosym													
Sioux	Prosym													
	BAI													
	BAI -Prosym													
CTG	Prosym													
	BAI													
	BAI -Prosym													
Purchases	Prosym													
	BAI													
	BAI -Prosym													
Sales	Prosym													
	BAI													
	% Difference													
Net	Prosym													
	BAI													
	BAI -Prosym													
Coal	Prosym													
	BAI													
	BAI -Prosym													
Ameren Gen	Prosym													
	BAI													
	BAI -Prosym													

Non-Proprietary

Case No. ER-2014-0258

Comparison of BAI Benchmark Case to Ameren Missouri Normalized Test Year Production Cost Run

All Numbers are in MWh

Plant	Source	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Callaway	Prosym													
	BAI													
	BAI -Prosym													
Labadie	Prosym													
	BAI													
	BAI -Prosym													
Meramec	Prosym													
	BAI													
	BAI -Prosym													
Rush Island	Prosym													
	BAI													
	BAI -Prosym													
Sioux	Prosym													
	BAI													
	BAI -Prosym													
Osage	Prosym													
	BAI													
	BAI -Prosym													
Keokuk	Prosym													
	BAI													
	BAI -Prosym													
CTG	Prosym													
	BAI													
	BAI -Prosym													
Purchases	Prosym													
	BAI													
	BAI -Prosym													
Sales	Prosym													
	BAI													
	% Difference													
Net	Prosym													
	BAI													
	BAI -Prosym													
Coal	Prosym													
	BAI													
	BAI -Prosym													
Hydro	Prosym													
	BAI													
	BAI -Prosym													
Ameren Gen	Prosym													
	BAI													
	BAI -Prosym													

MIEC Net Fuel Cost Recommendation
Case No. ER-2014-0258

Case	Ameren Missouri Generation Fuel Cost	Purchased Power Cost	Off System Sales of Energy Revenue	Net Fuel Cost
	(A)	(B)	(C)	(D) = (A) + (B) - (C)
BAI Benchmark Case	$ 876,508,191	$ 40,654,463	$ 239,940,613	$ 677,222,041
BAI Update Case	$ 882,477,834	$ 39,698,540	$ 251,306,693	$ 670,869,681
Delta	$ 5,969,643	$ (955,923)	$ 11,366,080	**$ (6,352,360)**
		Apply Net Fuel Cost Delta to Ameren Missouri's Net Fuel Cost		
Ameren Missouri	$ 854,241,530	$ 33,939,000	$ 214,495,000	$ 673,685,530
Apply Delta	NA	NA	NA	$ (6,352,360)
MIEC Recommendation	NA	NA	NA	**$ 667,333,170**