Exhibit No.:	_____
Issue(s):	Need for the project/ Economic Valuation / Pre-site energy Assessment Omissions
Witness/Type of Exhibit:	Marke/Rebuttal
Sponsoring Party:	Public Counsel
Case No.:	EA-2019-0181

REBUTTAL TESTIMONY

OF

GEOFF MARKE

Submitted on Behalf of
the Office of the Public Counsel

UNION ELECTRIC D/B/A AMEREN MISSOURI

CASE NO. EA-2019-0181

** **

Denotes Highly Confidential Information that has been Redacted

July 15, 2019

PUBLIC VERSION

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Under 4 CSR 240-3.105.	))))	File No. EA-2019-0181

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Geoff Marke, of lawful age and being first duly sworn, deposes and states:

1. My name is Geoff Marke. I am a Regulatory Economist for the Office of the Public Counsel.

2. Attached hereto and made a part hereof for all purposes is my rebuttal testimony.

3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.

Geoff Marke
Chief Economist

Subscribed and sworn to me this 15th day of July 2019.

JERENE A. BUCKMAN
My Commission Expires
August 23, 2021
Cole County
Commission #13754037

Jerene A. Buckman
Notary Public

My commission expires August 23, 2021.

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REBUTTAL TESTIMONY

OF

GEOFF MARKE

UNION ELECTRIC COMPANY
d/b/a Ameren Missouri
CASE NO. EA-2019-0181

I. INTRODUCTION

Q. Please state your name, title and business address.

A. Geoffrey Marke, PhD, Chief Economist, Office of the Public Counsel ("OPC"), P.O. Box 2230, Jefferson City, Missouri 65102.

Q. What are your qualifications and experience?

A. I have been in my present position with OPC since 2014 where I am responsible for economic analysis and policy research in electric, gas and water utility operations.

Q. Have you testified previously before the Missouri Public Service Commission?

A. Yes. A listing of the cases in which I have previously filed testimony and/or comments before the Commission is attached in Schedule GM-1.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of this testimony is to respond to the direct testimony of Ameren Missouri witnesses Matt Michels and Ajay K. Arora.

Q. What is OPC's position on the Outlaw Wind Project?

A. OPC supports the general proposition to acquire wind generation at the Outlaw Wind Project (the "Project" or "Outlaw") through a Build-Transfer Agreement ("BTA") in order to meet future RES compliance standards. However, this rebuttal testimony will articulate concerns regarding Ameren Missouri's request including:

- The request for a Certificate of Convenience and Necessity ("CCN") of 299 MW of potential wind, which would be 156 MW above and beyond what is necessary to meet Missouri's Renewable Energy Standard ("RES") requirement;

- Economic valuation of the project and whether it should be interconnected into the Southwest Power Pool ("SPP") or Midcontinent Independent System Operator ("MISO") regional transmission organization ("RTO"); and
- Pre-site energy assessment and wind sector management strategy omissions.

Where applicable, I will propose recommendations and/or request further clarification that may alleviate OPC's concerns moving forward. However, my silence in regards to any issue should not be construed as an endorsement of Ameren Missouri's position.

II. NEED FOR THE PROJECT

Q. Does Ameren Missouri need the 299MW of wind to serve its native load?

A. No.

Q. Does Ameren Missouri need the 299MW of wind for resource adequacy obligations under MISO?

A. No.

Q. Does Ameren Missouri need the requested 299 MW of wind to meet the Missouri Renewable Energy Standard of 15% for 2021?

A. Not all of it. If all three planned wind projects (400 MW at High Prairie, 157 MW at Brickyard Hills, and 299 MW at Outlaw) are built out as intended, Ameren Missouri will own 156 MW of excess wind generation above and beyond what it has projected to need to meet the Missouri RES.

Q. Is Ameren Missouri currently long, short, or even, on generating capacity to serve its load?

A. It is long on capacity.

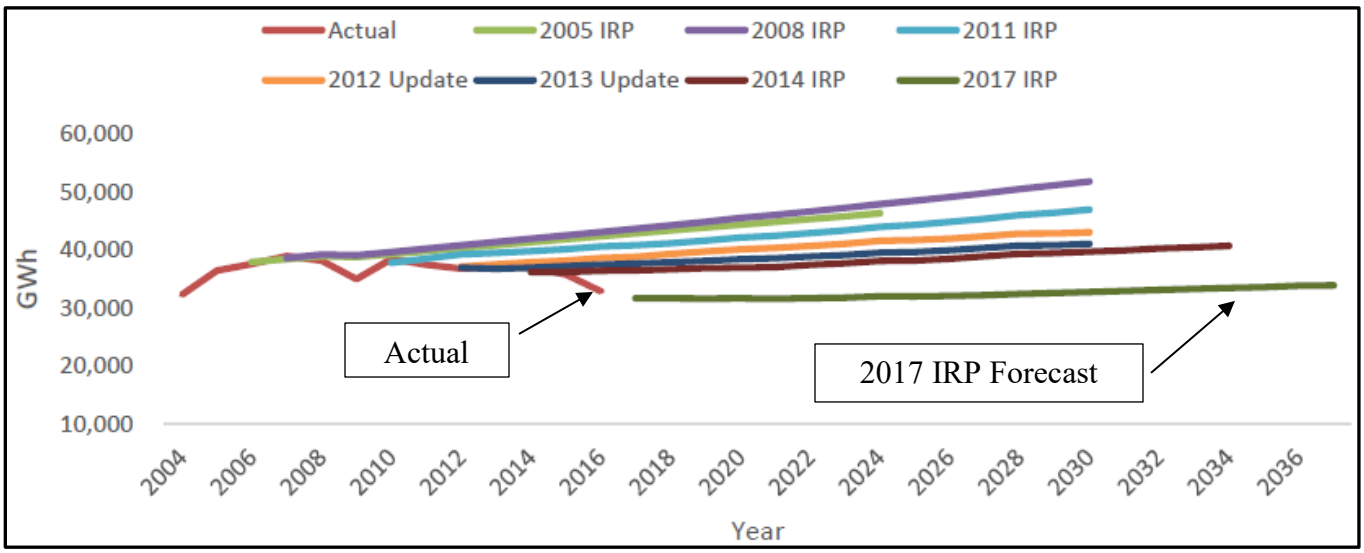
Q. What has been Ameren Missouri's recent and forecasted load growth?

A. Ameren Missouri's load growth has been flat or declined for several years, and it is not expected to grow within its planning period. According to Ameren Missouri's 2017 Integrated Resource Plan ("IRP"), Chapter 3—Load Analysis and Forecasting:

Compared to Ameren Missouri's last IRP, filed in 2014, both the level and the growth rate of the forecasts are lower. The 0.30% growth rate in retail sales in this filing (between 2018 and 2037) is also lower than the 0.6% retail sales growth rate expected for the study period in the 2014 IRP forecast largely due to a combination of factors.[1]

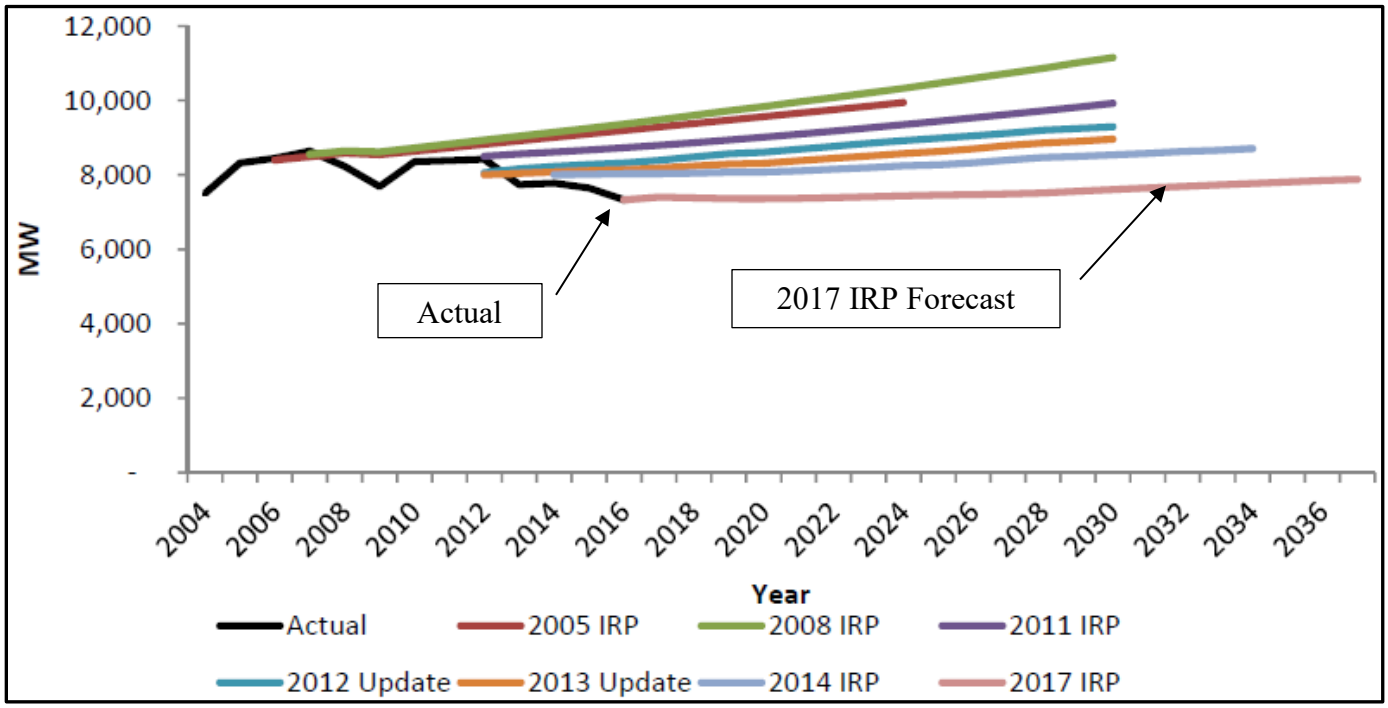
Figure's 1 and 2 provide a visual of Ameren Missouri's historical energy and demand IRP forecasts relative to its most recent 2017 forecast and clearly shows a lower expected load forecast than from any previous iteration.

Figure 1: Ameren Missouri actual historical energy sales and past IRP energy forecasts[2]



[1] EO-2018-0038 Chapter 3 Load Analysis and Forecasting, p. 2.
[2] Ibid. p. 5

Figure 2: Ameren Missouri actual historical peak demand and past IRP peak demand forecasts[3]

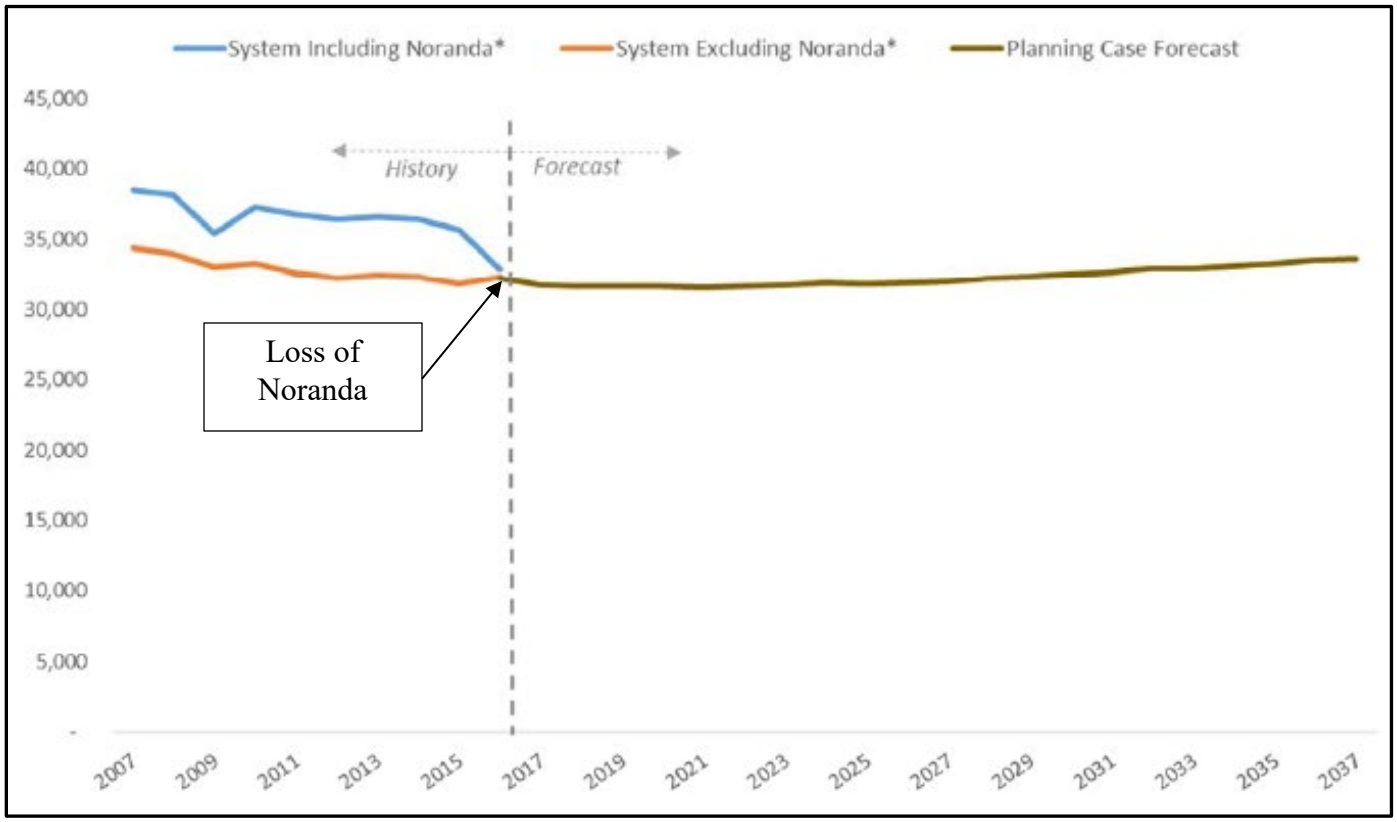


Q. What was the single biggest factor that contributed to the drop in historic and forecasted load?

A. The biggest factor was the loss of the New Madrid aluminum smelter. Noranda was Ameren Missouri's largest customer in the last decade, accounting for approximately 10% of Ameren Missouri's annual sales.[4] The impact of the loss of Noranda on Ameren Missouri's system can be seen in Figure 3.

[3] Ibid. p. 6
[4] Ibid. p. 37.

Figure 3: Ameren Missouri planning case energy sales forecast with and without Noranda[5]



Q. That is just one customer. What about the others?

A. Figures 4, 5 and 6 show historic and forecasted energy sales over a thirty-year period for residential, commercial and industrial classes reprinted from Ameren Missouri's most recent IRP. It also underscores how big of an impact the loss of Noranda was on energy sales.

[5] Ibid. p. 31.

Figure 4: Planning case forecast of residential class energy sales 2006 – 2036[6]

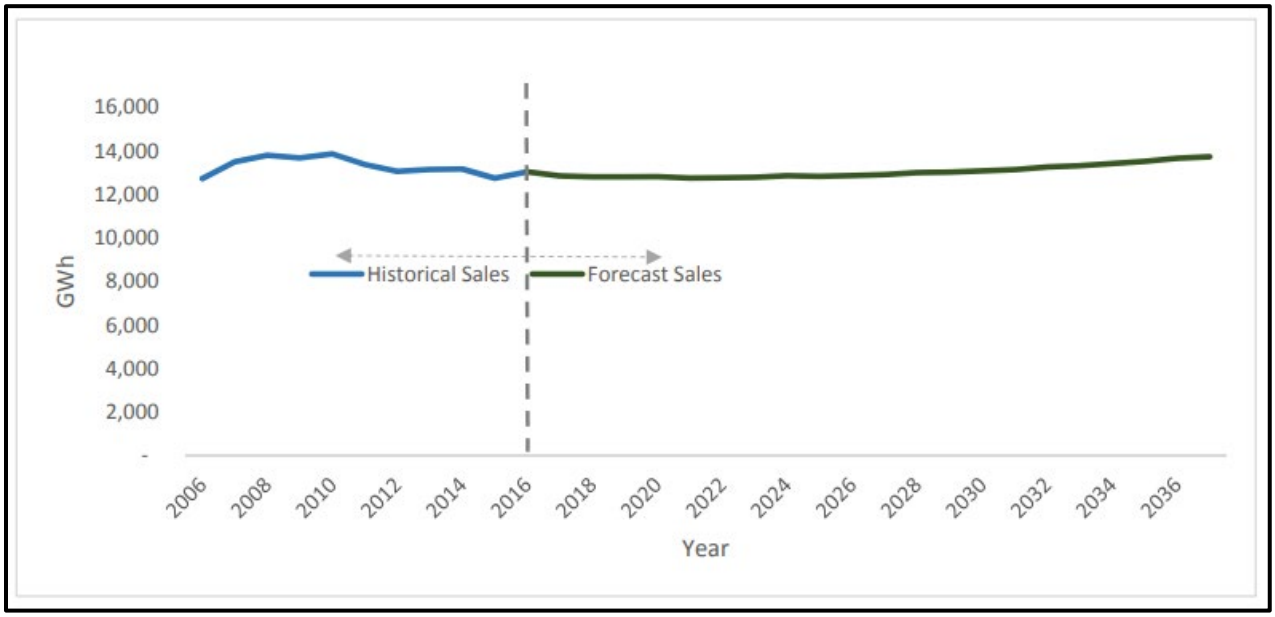
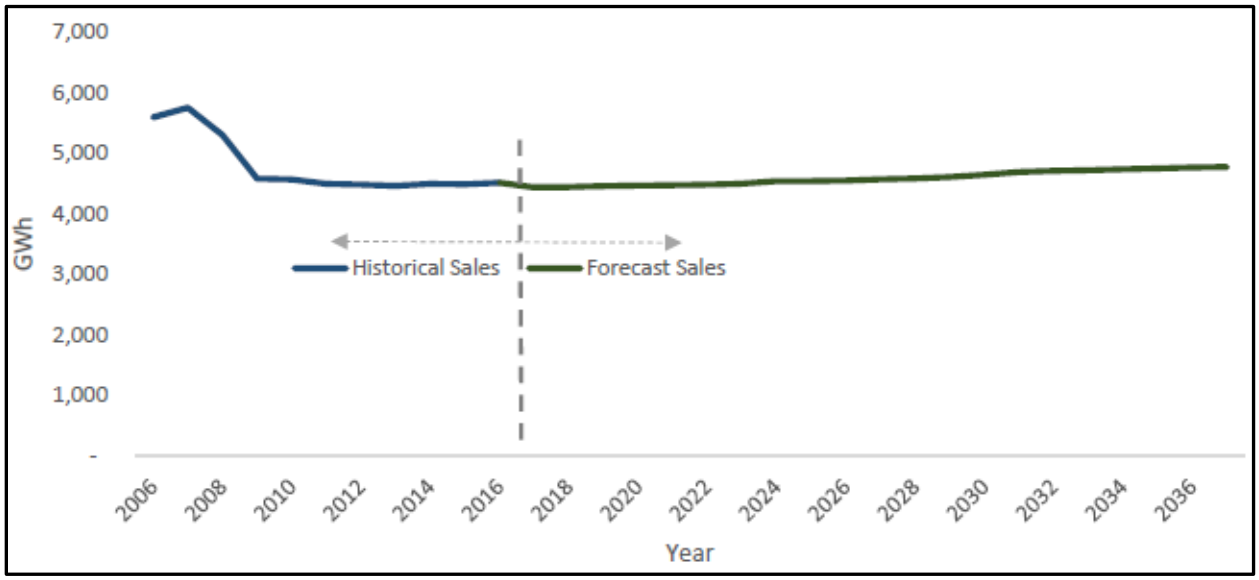


Figure 5: Planning case forecast of commercial class energy sales 2006 – 2036[7]

[6] Ibid. p. 33.
[7] Ibid. p. 35.

Figure 6: Planning case forecast of industrial class energy sales 2006 – 2036[8]



According to Ameren Missouri's recent IRP, the 2007-2009 economic recession and post-recession recovery likely impacted the historical growth rates, and demographic and economic trends are likely to meaningfully temper future sales.[9]

Q. Have Ameren Missouri's energy efficiency programs affected load?

A. Yes. The promotion of demand-side management techniques and naturally occurring efficiency adoption have likely impacted historic load and will likely continue to temper future load growth. Most recently, Ameren Missouri was approved for a MEEIA 3 in which ratepayers will invest over $300 million (conservatively) in program costs over the next two-and-half years (with additional costs for through-put compensation and an earnings opportunity) which should have the further effect of limiting any customer demand growth.

[8] Ibid. p. 36.
[9] Ibid. 36-37.

Q. Is Ameren Missouri planning on retiring its fossil fuel generating units earlier based on the most recent IRP?

A. No. Ameren Missouri's planned fossil fuel retirement dates have mostly either remained the same or have been pushed out further. This can be seen by comparing Ameren Missouri's two most recent triennial IRP filings as shown in Table 1.

Table 1: Ameren Missouri fossil fuel retirement changes between triennial IRP's[10,11]

Site	Fuel Type	Retirement Date 2014 IRP	Retirement Date 2017 IRP	Retirement Change
Labadie	Coal	2042	2042	No
Meramec	Coal	2022	2022	No
Rush Island	Coal	2046	2045	Yes (-1 year)
Sioux	Coal	2033	2033	No
Kirksville	Natural Gas	2017	2021	Yes (+4 years)
Howard Bend	Oil	2015	Retired	No
Fairgrounds	Oil	2015	2021	Yes (+6 years)
Meramec CTG-1	Oil	2017	2021	Yes (+4 years)
Meramec CTG-2	Natural Gas	2020	2021	Yes (+1 year)
Mexico	Oil	2020	2023	Yes (+3 years)
Moberly	Oil	2020	2023	Yes (+3 years)
Moreau	Oil	2020	2023	Yes (+3 years)

The lone outlier is Ameren Missouri's one-year accelerated planned retirement date of its Rush Island Energy Center; it moved the date 2046 to 2045. To be clear, that is 27 years into the future.

[10] EO-2018-0038 Chapter 4 Existing Supply-Side Resources, p. 11-12. & EO-2015-0084 Chapter 4: Existing Supply-Side Resources, p. 12-13.
[11] This is not an exhaustive list of Ameren Missouri's supply side generation units. Furthermore, there may be more than one unit at a particular site; however, the Company has not indicated individual unit retirements for general sites.

Q. Could you provide a summary of Ameren Missouri's planned generation additions?

A. Yes. Publically announced planned additions are included in Table 2 below.

Table 2: Ameren Missouri new or publicly planned capacity additions

Site	Fuel Type	Size
High Prairie	Wind	400 MW
Brickyard Hills	Wind	157 MW
Outlaw	Wind	299 MW
Green Tariff	Wind	Up to 200 MW
BJC/Wash U.	Solar	1.8 MW
Lambert Airport	Solar	1 MW

Additionally, although details have not yet been provided (and may ultimately be withdrawn), there are two additional utility-scale solar projects currently filed as a notices in EFIS (Case Nos: EA-2019-0371 and EA-2019-0209).

Q. If Ameren Missouri is long on capacity, aggressively supporting demand-side management programs, extending the useful life of its supply-side investments, and is forecasting historically lower load growth, why is Ameren Missouri requesting approval for more generation than is needed to meet the 2021 Missouri RES?

A. Three reasons are given in the direct testimony of Ameren Missouri witness Ajay K. Arora:

> First, until all three projects are built and in operation we cannot know with certainty how much capacity the Company will own. . . . Second, the RES compliance needs are based on a projection of sales as of 2021 and beyond. Those projections could be too low, which would require more than the estimated capacity needed. Third, the RES establishes a minimum for compliance but does not cap the energy for renewable energy resources that can be obtained.[12]

[12] EA-2019-0181Direct Testimony of Ajay K. Arora p. 29, 9-10, 21-23 & p. 30, 1-2.

Q. All things being equal, what would be the most cost-effective manner to meet Missouri's Renewable Energy Standard?

A. In a vacuum, I believe the most cost effective manner to meet Missouri's RES would be through the purchase of Renewable Energy Credits ("RECs").

Q. Do you have concerns with Ameren Missouri acquiring "additional" wind generation above and beyond its 2021 RES requirement?

A. Yes. Given Ameren Missouri's current generation make-up and expected load projections, I have concerns with the Commission approving more than 700 MW of wind in total. That has been the stated threshold in which the previous two wind CCN's approvals were premised on. Building out yet more capacity and increasing rate base even further beyond what is mandated will result in increasing rates well beyond what Ameren Missouri needs to serve its customers.

Q. How do you respond to Mr. Arora's argument that High Prairie, Brickyard or the Outlaw wind projects may not materialize in full?

A. Ameren Missouri has argued that 700 MW of wind is needed to meet the 2021 RES. Whether or not ownership of 700 MW was the most cost effective means achieve the 2021 RES is highly unlikely compared to merely purchasing RECs for compliance. However, OPC did not argue that Ameren Missouri should purchase RECs instead of owning 700 MW of wind as a rate base asset. OPC accepted Ameren Missouri's argument to own the 700 MW of wind farms collectively in the first (High Prairie) and second CCN (Brickyard). We were also prepared to accept that same rationale in the third and final CCN (Outlaw) as long as the total of all three projects resulted in 700 MW as premised from the start.

Now, in the third and final CCN, Mr. Arora argues for up to 156 MW more.

The Commission should be cognizant that this is not a trivial amount of money. According to Ameren Missouri's estimates the range of costs for all three projects were projected as follows:

- High Prairie (400 MW) ** **
- Brickyard (157 MW) ** **

- Outlaw (MISO 244 MW) ** **
- Outlaw (SPP 299 MW) ** **
- High Cost 856 MW = ** **
- Low Cost 801 MW = ** **
- Amount needed for RES = 700 MW
- Amount needed for native load = none

There have been no material change to Ameren Missouri's load to warrant this request. Ameren Missouri has no need for additional capacity. Ameren Missouri is not retiring any fossil fuel plant early. Ratepayers are paying hundreds of millions of dollars for demand side programs to reduce load and will pay ** ** for wind generation that is not needed to serve it to meet the RES.

Ameren Missouri's request to exceed the RES by up to 156MW is essentially an argument for another utility-scale wind farm. That excess generation is an unnecessary investment that results in a windfall profit for the Company. If Ameren Missouri is ultimately short because one (or all) of its projected sites does not materialize in full it can always buy cheap renewable energy credits ("RECs") to meet any realized 2021 RES shortfall. Given the influx of wind generation expected to come online and the continued drop in renewables such an outcome would seemingly be the most prudent use of ratepayer funds. This is especially true in light of all of the expected capital costs associated with Ameren Missouri's Smart Energy Plan (Case No. EO-2019-0044) as well as potential environmental remediation costs articulated in OPC's comments in its most recent annual IRP, Case No. EO-2019-0314. At a minimum, Ameren Missouri's decision to build wind generation rather than buying RECs must be prudent, and in future rate cases Ameren Missouri should be required to demonstrate why buying RECs was not the more prudent decision considering the information available to Ameren Missouri today.

Q. Are there any conditions you would recommend to address your concern with Ameren Missouri building more than 700 MW of wind?

A. Possibly. In Case No. ET-2018-0063, OPC entered into a stipulation and agreement with the Company and other parties that allowed Ameren Missouri to offer a Green Tariff to certain commercial, industrial or municipal customers of a certain size. That stipulation was entered into over a year ago on June 12th, 2018. To date, there have been no participants.

Although further dialogue and attention to detail is required, one possible remedy to Ameren Missouri's plan to overbuild wind generation is to allocate the excess amount above the RES requirement to Green Tariff customers and hold non-Green Tariff customers harmless for those excess costs. Such an arrangement would seemingly be in the public interest assuming other outstanding concerns are settled.

III. ECONOMIC VALUATION

Q. Can you summarize the material differences between interconnecting into the SPP or MISO market?

A. As I understand it, the transmission costs are unknown and both the SPP and MISO interconnections are technically still on the table as possible options for the Outlaw developer as the Interconnection Studies are not complete. Under the SPP scenario, the wind farm is expected to contain both more turbines and have a greater overall size of average turbine than if it were sold into MISO. The cost results on a per turbine basis are as follows:

Cost per turbine under:

- SPP Base ** **
- SPP High ** **
- MISO Base ** **
- MISO High ** **

**

**

Q. Why can't the MISO scenario include the same turbine assumptions as the SPP scenario?

A. I don't know. It seems as though the SPP scenario is only more "beneficial" because of scale. Both scenarios result in overbuilt capacity, but the SPP scenario is more pronounced because there is more of it (i.e., both more and larger turbines). Stated differently, the SPP scenario operates under the same premise as "super-sizing" a meal at McDonalds. The super-sized meal is both more expensive and contains more calories than a "normal" course of meal requires, but results in the cost of both the number French fries and ounces of soda being cheaper on a per unit basis relative to the non-super-sized option. Why Ameren Missouri modeled a "super-sized" scenario for SPP and not for MISO is unclear.[15]

Q. Does it matter if Ameren Missouri ends up selling the wind energy into an RTO it does not participate in?

A. I don't think so, but I am not sure if I have fully considered all of the implications of such an outcome. At a minimum, selling the energy into SPP means that the Outlaw wind project would not be further undercutting Ameren Missouri's existing generation on the market; however, SPP benefits would not include any future capacity market revenues like MISO would. Mr.

[13] **

**

[14] **

**

[15] A more apt description, would be as follows: A "regular" caloric meal is mandated by the state, but only a McDonald's "large" (MISO) and a McDonald's "super-sized large" (SPP) meal option were considered.

Arora suggests the SPP scenario provides greater schedule certainty to complete the project, but I have not seen any basis for that assumption.

Ameren Missouri's economic analysis also assumes different transmission costs (which are unknown today), but it is unclear whether that is a function of the different markets, because the Outlaw project would be bigger under the SPP scenario than the MISO project, or something else entirely. It also does not appear that Ameren Missouri is utilizing SPP-specific LMP market forecast - rather the Company relies on its low, mid, high forecasts from its IRP for both SPP and MISO. Even then, it is questionable whether those data assumptions are still reliable as both markets have been inundated with wind generation since Ameren Missouri's IRP forecasts were estimated. Further inquiry is warranted on this topic as OPC is not presently taking a position on this issue other than to make the general comment that benefits are likely overstated and it is not clear that the more SPP-wind scenario is the clear cut best option.

Q. Do you have further questions regarding Mr. Michels' work papers?

A. Yes. OPC currently has more questions regarding Mr. Michels' economic analysis, including his assumptions regarding the 1% RES rate impact results. As such, OPC will need to make arrangements to speak with Ameren Missouri further about its assumptions before we can definitively draw any conclusions.

IV. PRE-SITE ENERGY ASSESSMENT OMISSIONS

Q. Did Ameren Missouri conduct a third-party pre-site energy assessment of the Outlaw Wind Project?

A. A pre-site energy assessment was conducted and included as an attachment in Mr. Arora's direct testimony. However, it is unclear whether or not the developer (Tradewind? Inel? ** **) contracted the assessment with ** ** or if it was Ameren Missouri.

Q. Do you have concerns regarding the pre-site energy assessment of the Outlaw Wind Project?

A. Yes. **

**

Q. What are wind curtailments?

A. The U.S. National Renewable Energy Lab ("NREL") defines curtailment as:

> A reduction in the output of a generator from what it could otherwise produce given available resources (e.g., wind or sunlight), typically on an involuntary basis. Curtailments can result when operators or utilities command wind and solar generators

[16] EA-2019-0181 Direct Testimony of Ajay K. Arora, HC Schedule AKA-D2 2137-2138. See also GM-2 for the observations and recommendations in their entirety.
[17] It is also worth noting that **

**

> to reduce output to minimize transmission congestion or otherwise manage the system or achieve the optimal mix of resources. Curtailment of wind and solar resources typically occurs because of transmission congestion or lack of transmission access, but it can also occur for reasons such as excess generation during low load periods that could cause baseload generators to reach minimum generation thresholds, because of voltage or interconnection issues, or to maintain frequency requirements, particularly for small, isolated grids.[18]

Other examples of involuntary or enforced curtailment include the death or mitigation of pending death of an endangered or protected species.

Q. Does Ameren Missouri's analysis account for curtailments associated with the MISO or SPP market dispatch or due to grid congestion?

A. No.

Q. Does Ameren Missouri's analysis account for curtailments associated with endangered or protected species?

A. No.

Q. Are there other examples of potential causes of curtailments (or reductions in operation output) not articulated in the excerpt from NREL?

A. Yes. Wind curtailments can also occur due to improper wind sector management (i.e., turbine loading and performance is influenced by close proximity to other turbines or farms) which can induced wake effects.

Q. What are wake effects?

A. Wind turbines extract energy from the wind and downstream there is a wake from the wind turbine where wind speed is reduced. The decreases in downwind wind speeds are a result of wind turbines being too close to another (internal wake effects) or wind farms being too close to one another (external wake effects). Because wind developers identify locations with strong

[18] Bird L., et al.(2014) Wind and solar energy curtailment: experience and practice in the United States. *NREL* p. 1. https://www.nrel.gov/docs/fy14osti/60983.pdf

wind resources, buildable areas and proximity to transmission lines and roads with farms tend to cluster together; therefore developers and buyers should consider future wind farms in the vicinity of the project under construction (future wake effects).

Q. Why are wake effects a concern for wind projects?

A. Because the phenomenon results in physical reductions of downward speeds of wind and thus impact a farm's generation and revenues. This can also lead to premature fatigue damage of turbine components or higher failure rates. According to Lundquist, et al. (2019) turbine wakes have been observed to extend 25 miles or more for onshore wind farms.[19]

Q. Did the pre-site energy assessment study consider internal and external wake effects?

A. Yes. The study modeled internal wake effects, external wake effects due to wind farms from Farmers City (146 MW), Cow Branch (50.4 MW), Loess Hills (5 MW), and Rock Creek (300 MW).

Q. Did the pre-site energy assessment study consider future wake effects?

A. **

** OPC is also aware of at least one additional wind farm in Atchison County that is pending, South Rock (244 MW).[20]

Additionally, OPC would contend that nearby Nodaway County may need to be considered which would include the following wind farms: Bluegrass (56.7MW), Lost Creek (150 MW), Conception (50.4 MW), Clear Creek (242 MW), and potentially White Cloud (238 MW).[21]

Q. Will wake effects continue to be a concern for Outlaw or Brickyard in the future?

A. Yes, absent any coordinated effort or wind farm management strategy, there will continue to be diminishing (or overstated) power from stacking wind farms next to each other. If all of the

[19] Lundquist, J.K., eta l. (2019) Costs and consequences of wind turbine wake effects arising from uncoordinated wind energy development. *Nature Energy*. 4.26-34. https://www.researchgate.net/publication/329042201_Costs_and_consequences_of_wind_turbine_wake_effects_arising_from_uncoordinated_wind_energy_development

[20] Tradewind Energy, South Rock. https://tradewindenergy.com/project/south-rock/

[21] Tradewind Energy, White Cloud. https://tradewindenergy.com/project/white-cloud/

aforementioned wind farms (including Outlaw) were to become operational that would represent twelve wind farms across two counties and 1,885 MW of wind by 2021. No doubt, there could be further development in neighboring Iowa, Nebraska, and Kansas or within Atchison or Nodaway County that could further exacerbate wake effects on existing projects.

Q. Does the siting of wind farms next to each other have any other potential negative impacts?

A. Yes. As articulated in the rebuttal testimony of Dr. Janet Haslerig in Case No. EA-2019-0021, there is a potential for a "cumulative effect" on species of concern from multiple wind projects in a given area.[22] Stated differently, the survival of a vulnerable or endangered species such as an Indiana bat or bald eagle will likely be strongly correlated with both the scale and frequency of wind turbines in a given area. As a result there may could be material changes or impacts to the economics of a wind farm over its assumed operational life that should be considered but are not currently contemplated in this case.

Q. Do you have any specific recommendations as it pertains to the information you provided?

A. I articulated two potential alternative options for the Commissions consideration if Ameren Missouri's combined wind efforts fall short of the Missouri RES (buy affordable RECs on the market) or if Ameren Missouri ultimately overbuilds (allocate overbuild to the Green Tariff customers) and look forward to hearing the Company's response in surrebuttal.

I have also articulated a number of concerns related to the economic analysis and the pre-site assessment; however, OPC has not taken a definitive position on whether or not those concerns are material.

Q. Does this conclude your testimony?

A. Yes.

[22] EA-2019-0021 Rebuttal testimony of Dr. Janet Haslerig p. 9, 13-19.

CASE PARTICPATION OF
GEOFF MARKE, PH.D.

Company Name	Employed Agency	Case Number	Issues
Union Electric Company d/b/a Ameren Missouri	Office of Public Counsel (OPC)	EA-2019-0181	**Rebuttal:** Need for the Project, Economic Valuation, Pre-Site Energy Assessment
KCP&L Greater Missouri Operations Company	Office of Public Counsel (OPC)	EC-2019-0200	**Surrebuttal:** Deferral Accounting and Stranded Assets
Union Electric Company d/b/a Ameren Missouri	OPC	ED-2019-0309	**Memorandum:** on the "Aluminum Smelter Rate"
KCP&L Greater Missouri Operations Company	OPC	EO-2019-0067	**Rebuttal:** Renewable Energy Credits
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2019-0314	**Memorandum:** Notice of Deficiency to Annual IRP Update
Rule Making	OPC	WX-2019-0380	**Memorandum:** on Affiliate Transaction Rules for Water Corporations
Working Case: Evaluate Potential Mechanisms for Facilitating Installation of Electric Vehicle Charging Stations	OPC	EW-2019-0229	**Memorandum:** on Policy Surrounding Electric Vehicles and Electric Vehicle Charging Stations
Rule Making	OPC	EX-2019-0050	**Memorandum** on Solar Rebates and Low Income Customers
Union Electric Company d/b/a Ameren Missouri	OPC	GR-2019-0077	**Direct:** Billing Practices **Rebuttal**: Rate Design, Decoupling, Energy Efficiency, Weatherization, CHP
Empire District Electric Company	OPC	EA-2019-0010	**Rebuttal:** Levelized Cost of Energy, Wind in the Southwest Power Pool **Surrebuttal**: SPP Market Conditions, Property Taxes, Customer Protections
Empire District Electric Company /Kansas City Power & Light & KCP&L Greater Missouri Operations Company/Union Electric Company d/b/a Ameren Missouri	OPC	EO-2019-0066 EO-2019-0065 EO-2019-0064 EO-2019-0063	**Memorandum:** Additive Manufacturing and Cement Block Battery Storage (IRP: Special Contemporary Topics)
Working Case: Allocation of Solar Rebates from SB 564	OPC	EW-2019-0002	**Memorandum** on Solar Rebates and Low Income Customers
Rule Making Workshop	OPC	AW-2018-0393	**Memorandum:** Supplemental Response to Staff Questions pertaining to Rules

			Governing the Use of Customer Information
Union Electric Company d/b/a Ameren Missouri	OPC	ET-2018-0132	**Rebuttal:** Line Extension / Charge Ahead – Business Solutions / Charge Ahead – Electric Vehicle Infrastructure **Supplemental Rebuttal:** EV Adoption Performance Base Metric
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2018-0211	**Rebuttal:** MEEIA Cycle III Application **Surrebuttal:** Cost Effectiveness Tests / Equitable Energy Efficiency Baseline
Union Electric Company d/b/a Ameren Missouri	OPC	EA-2018-0202	**Rebuttal:** Renewable Energy Standard Rate Adjustment Mechanism/Conservation **Surrebuttal:** Endangered and Protected Species
Kansas City Power & Light & KCP&L Greater Missouri Operations Company	OPC	ER-2018-0145 ER-2018-0146	**Direct:** Smart Grid Data Privacy Protections **Rebuttal:** Clean Charge Network / Community Solar / Low Income Community Solar / PAYS/ Weatherization/Economic Relief Pilot Program/Economic Development Rider/Customer Information System and Billing **Rebuttal:** TOU Rates / IBR Rates / Customer Charge / Restoration Charge **Surrebuttal:** KCPL-GMO Consolidation / Demand Response / Clean Charge Network / One CIS: Privacy, TOU Rates, Billing & Customer Experience
Union Electric Company d/b/a Ameren Missouri	OPC	ET-2018-0063	**Rebuttal:** Green Tariff
Liberty Utilities	OPC	GR-2018-0013	**Surrebuttal:** Decoupling
Empire District Electric Company	OPC	EO-2018-0092	**Rebuttal:** Overview of proposal/ MO PSC regulatory activity / Federal Regulatory Activity / SPP Activity and Modeling / Ancillary Considerations **Surrebuttal** Response to parties **Affidavit** in opposition to the non-unanimous stipulation and agreement
Great Plains Energy Incorporated, Kansas City Power & Light Company, KCP&L Greater Missouri Operations Company, and Westar Energy, Inc.	OPC	EM-2018-0012	**Rebuttal:** Merger Commitments and Conditions / Outstanding Concerns

Missouri American Water	OPC	WR-2017-0285	**Direct:** Future Test Year/ Cost Allocation Manual and Affiliate Transaction Rules for Large Water Utilities / Lead Line Replacement **Direct:** Rate Design / Cost Allocation of Lead Line Replacement **Rebuttal**: Lead Line Replacement / Future Test Year/ Decoupling / Residential Usage / Public-Private Coordination **Rebuttal**: Rate Design **Surrebuttal**: Affiliate Transaction Rules / Decoupling / Inclining Block Rates / Future Test Year / Single Tariff Pricing / Lead Line Replacement
Missouri Gas Energy / Laclede Gas Company	OPC	GR-2017-0216 GR-2017-0215	**Rebuttal:** Decoupling / Rate Design / Customer Confidentiality / Line Extension in Unserved and Underserved Areas / Economic Development Rider & Special Contracts **Surrebuttal:** Pay for Performance / Alagasco & EnergySouth Savings / Decoupling / Rate Design / Energy Efficiency / Economic Development Rider: Combined Heat & Power
Indian Hills Utility	OPC	WR-2017-0259	**Direct:** Rate Design
Rule Making	OPC	EW-2018-0078	**Memorandum:** Cogeneration and net metering - Disclaimer Language regarding rooftop solar
Empire District Electric Company	OPC	EO-2018-0048	**Memorandum:** Integrated Resource Planning: Special Contemporary Topics Comments
Kansas City Power & Light	OPC	EO-2018-0046	**Memorandum:** Integrated Resource Planning: Special Contemporary Topics Comments
KCP&L Greater Missouri Operations Company	OPC	EO-2018-0045	**Memorandum:** Integrated Resource Planning: Special Contemporary Topics Comments
Missouri American Water	OPC	WU-2017-0296	**Direct:** Lead line replacement pilot program **Rebuttal:** Lead line replacement pilot program **Surrebuttal:** Lead line replacement pilot program
KCP&L Greater Missouri Operations Company	OPC	EO-2017-0230	**Memorandum** on Integrated Resource Plan, preferred plan update

Working Case: Emerging Issues in Utility Regulation	OPC	EW-2017-0245	**Memorandum** on Emerging Issues in Utility Regulation / **Presentation**: Inclining Block Rate Design Considerations **Presentation**: Missouri Integrated Resource Planning: And the search for the "preferred plan." **Memorandum**: Draft Rule 4 CSR 240-22.055 DER Resource Planning
Rule Making	OPC	EX-2016-0334	**Memorandum** on Missouri Energy Efficiency Investment Act Rule Revisions
Great Plains Energy Incorporated, Kansas City Power & Light Company, KCP&L Greater Missouri Operations Company, and Westar Energy, Inc.	OPC	EE-2017-0113 / EM-2017-0226	**Direct**: Employment within Missouri / Independent Third Party Management Audits / Corporate Social Responsibility
Union Electric Company d/b/a Ameren Missouri	OPC	ET-2016-0246	**Rebuttal**: EV Charging Station Policy **Surrebuttal**: EV Charging Station Policy
Kansas City Power & Light		ER-2016-0156	**Direct:** Consumer Disclaimer **Direct:** Response to Commission Directed Questions **Rebuttal:** Customer Experience / Greenwood Solar Facility / Dues and Donations / Electric Vehicle Charging Stations **Rebuttal:** Class Cost of Service / Rate Design **Surrebuttal:** Clean Charge Network / Economic Relief Pilot Program / EEI Dues / EPRI Dues
Union Electric Company d/b/a Ameren Missouri	OPC	ER-2016-0179	**Direct:** Consumer Disclaimer / Transparent Billing Practices / MEEIA Low-Income Exemption **Direct**: Rate Design **Rebuttal:** Low-Income Programs / Advertising / EEI Dues **Rebuttal:** Grid-Access Charge / Inclining Block Rates /Economic Development Riders
KCP&L Greater Missouri Operations Company	OPC	ER-2016-0156	**Direct:** Consumer Disclaimer **Rebuttal:** Regulatory Policy / Customer Experience / Historical & Projected Customer Usage / Rate Design / Low-Income Programs

			Surrebuttal: Rate Design / MEEIA Annualization / Customer Disclaimer / Greenwood Solar Facility / RESRAM / Low-Income Programs
Empire District Electric Company, Empire District Gas Company, Liberty Utilities (Central) Company, Liberty Sub-Corp.	OPC	EM-2016-0213	**Rebuttal:** Response to Merger Impact **Surrebuttal:** Resource Portfolio / Transition Plan
Working Case: Polices to Improve Electric Regulation	OPC	EW-2016-0313	**Memorandum** on Performance-Based and Formula Rate Design
Working Case: Electric Vehicle Charging Facilities	OPC	EW-2016-0123	**Memorandum** on Policy Considerations of EV stations in rate base
Empire District Electric Company	OPC	ER-2016-0023	**Rebuttal:** Rate Design, Demand-Side Management, Low-Income Weatherization **Surrebuttal:** Demand-Side Management, Low-Income Weatherization, Monthly Bill Average
Missouri American Water	OPC	WR-2015-0301	**Direct:** Consolidated Tariff Pricing / Rate Design Study **Rebuttal:** District Consolidation/Rate Design/Residential Usage/Decoupling **Rebuttal**: Demand-Side Management (DSM)/ Supply-Side Management (SSM) **Surrebuttal:** District Consolidation/Decoupling Mechanism/Residential Usage/SSM/DSM/Special Contracts
Working Case: Decoupling Mechanism	OPC	AW-2015-0282	**Memorandum:** Response to Comments
Rule Making	OPC	EW-2015-0105	Missouri Energy Efficiency Investment Act Rule Revisions, Comments
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2015-0084	Triennial Integrated Resource Planning Comments
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2015-0055	**Rebuttal**: Demand-Side Investment Mechanism / MEEIA Cycle II Application **Surrebuttal**: Potential Study / Overearnings / Program Design **Supplemental Direct:** Third-party mediator (Delphi Panel) / Performance Incentive

			Supplemental Rebuttal: Select Differences between Stipulations **Rebuttal:** Pre-Pay Billing
The Empire District Electric Company	OPC	EO-2015-0042	Integrated Resource Planning: Special Contemporary Topics Comments
KCP&L Greater Missouri Operations Company	OPC	EO-2015-0041	Integrated Resource Planning: Special Contemporary Topics Comments
Kansas City Power & Light	OPC	EO-2015-0040	Integrated Resource Planning: Special Contemporary Topics Comments
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2015-0039	Integrated Resource Planning: Special Contemporary Topics Comments
Union Electric Company d/b/a Ameren Missouri	OPC	EO-2015-0029	Ameren MEEIA Cycle I Prudence Review Comments
Kansas City Power & Light	OPC	ER-2014-0370	**Direct** (Revenue Requirement): Solar Rebates **Rebuttal:** Rate Design / Low-Income Weatherization / Solar Rebates **Surrebuttal:** Economic Considerations / Rate Design / Cyber Security Tracker
Rule Making	OPC	EX-2014-0352	**Memorandum** Net Metering and Renewable Energy Standard Rule Revisions,
The Empire District Electric Company	OPC	ER-2014-0351	**Rebuttal:** Rate Design/Energy Efficiency and Low-Income Considerations
Rule Making	OPC	AW-2014-0329	Utility Pay Stations and Loan Companies, Rule Drafting, Comments
Union Electric Company d/b/a Ameren Missouri	OPC	ER-2014-0258	**Direct:** Rate Design/Cost of Service Study/Economic Development Rider **Rebuttal:** Rate Design/ Cost of Service/ Low Income Considerations **Surrebuttal:** Rate Design/ Cost-of-Service/ Economic Development Rider
KCP&L Greater Missouri Operations Company	OPC	EO-2014-0189	**Rebuttal:** Sufficiency of Filing **Surrebuttal:** Sufficiency of Filing
KCP&L Greater Missouri Operations Company	OPC	EO-2014-0151	Renewable Energy Standard Rate Adjustment Mechanism (RESRAM) Comments
Liberty Natural Gas	OPC	GR-2014-0152	**Surrebuttal:** Energy Efficiency
Summit Natural Gas	OPC	GR-2014-0086	**Rebuttal:** Energy Efficiency **Surrebuttal:** Energy Efficiency
Union Electric Company d/b/a Ameren Missouri	OPC	ER-2012-0142	**Direct:** PY2013 EM&V results / Rebound Effect **Rebuttal:** PY2013 EM&V results **Surrebuttal:** PY2013 EM&V results **Direct:** Cycle I Performance Incentive **Rebuttal:** Cycle I Performance Incentive

Kansas City Power & Light	Missouri Public Service Commission Staff	EO-2014-0095	**Rebuttal:** MEEIA Cycle I Application testimony adopted
KCP&L Greater Missouri Operations Company	Missouri Division of Energy (DE)	EO-2014-0065	Integrated Resource Planning: Special Contemporary Topics Comments
Kansas City Power & Light	DE	EO-2014-0064	Integrated Resource Planning: Special Contemporary Topics Comments
The Empire District Electric Company	DE	EO-2014-0063	Integrated Resource Planning: Special Contemporary Topics Comments
Union Electric Company d/b/a Ameren Missouri	DE	EO-2014-0062	Integrated Resource Planning: Special Contemporary Topics Comments
The Empire District Electric Company	DE	EO-2013-0547	Triennial Integrated Resource Planning Comments
Working Case: State-Wide Advisory Collaborative	OPC	EW-2013-0519	**Presentation:** Does Better Information Lead to Better Choices? Evidence from Energy-Efficiency Labels **Presentation:** Customer Education & Demand-Side Management **Presentation:** MEEIA: Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis
Independence-Missouri	OPC	Indy Energy Forum 2014	**Presentation:** Energy Efficiency
Independence-Missouri	OPC	Indy Energy Forum2015	**Presentation:** Rate Design
NARUC – 2017 Winter, Washington D.C.	OPC	Committee on Consumer Affairs	**Presentation:** PAYS Tariff On-Bill Financing
NASUCA – 2017 Mid-Year, Denver	OPC	Committee on Water Regulation	**Presentation:** Regulatory Issues Related to Lead-Line Replacement of Water Systems
NASUCA – 2017 Annual Baltimore,	OPC	Committee on Utility Accounting	**Presentation:** Lead Line Replacement Accounting and Cost Allocation
NARUC – 2018 Annual, Orlando	OPC	Committee on Consumer Affairs	**Presentation:** PAYS Tariff On-Bill Financing Opportunities & Challenges
Critical Consumer Issues Forum (CCIF)—New Orleans	OPC	Examining Polices for Delivering Smart Mobility	**Presentation:** Missouri EV Charging Station Policy in 4 Acts: Missouri Office of the Public Counsel Perspective

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