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Witness: *Michael L. Stahlman*
Sponsoring Party: *MoPSC Staff*
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Case No.: *EO-2024-0002*
Date Testimony Prepared: *December 15, 2023*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

TARIFF/RATE DESIGN DEPARTMENT

REBUTTAL TESTIMONY

OF

MICHAEL L. STAHLMAN

EVERGY MISSOURI METRO, INC.,
d/b/a EVERGY MISSOURI METRO

and

EVERGY MISSOURI WEST, INC.,
d/b/a EVERGY MISSOURI WEST

CASE NO. EO-2024-0002

Jefferson City, Missouri
December 2023

REBUTTAL TESTIMONY

OF

MICHAEL L. STAHLMAN

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d/b/a EVERGY MISSOURI WEST

CASE NO. EO-2024-0002

Q. Please state your name and business address.

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

Q. Please provide your credentials.

A. Please see attached Schedule MLS-r1.

EXECUTIVE SUMMARY

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to discuss the implications of the lack of proper data retention on developing Time of Use ("TOU") rates, with particular focus on weather and weather normalization.

Q. Please summarize your testimony.

A. None of Evergy Missouri Metro's (EMM) and Evergy Missouri West's (EMW) witnesses discussed the impact of TOU rates and current data retention policies on the weather normalization process both Staff and Evergy rely on in a rate case. The implications of TOU rates with large differentials weakens the assumptions used in the current process. While all

methods of weather normalizing only provide estimates of load and peak information, some methods of estimating data are more accurate than others. Evergy should possess data, due to its use of Advanced Metering Infrastructure (AMI) meters and presumptively providing its customers with accurate bills, which could improve both the Evergy's and Staff's estimates of weather normalized load and peaks.

WEATHER NORMALIZATION

Q. What is weather normalization?

A. In many of the classes of service, electricity consumption is highly responsive to the weather, specifically temperature. As the temperature reaches higher levels, the demand for cooling, air conditioning and fans increases the customers' consumption of electricity. As the weather becomes colder, the demand for additional heating, via electric space heating, also forces an increase in electricity consumption. Electric air conditioning and space heating is prevalent in EMM and EMW's service territory; therefore, it follows that the respective electric loads of EMM and EMW are linked with and responsive to temperature. Weather normalization is the process of measuring the impact of weather on energy consumption and removing abnormal weather influence from the test period in order to provide a more accurate representation of "normal" electric usage.

Q. What information is weather normalized in a typical rate case?

A. The major weather normalization process is for determining each customer class's weather normalized load. Staff also weather normalizes a company's hourly load requirement at transmission, which is used in the determination of normalized fuel expenses, and customer class peak information to determine coincident peak ("CP") and non-coincident peak ("NCP") data for the Class Cost of Service ("CCOS") study.

Q. Briefly describe the weather normalization process for determining load.

A. The weather normalization process for load has two parts: first a regression analysis, then applying the results of the regression analysis to a company's billing information, which results in a monthly weather adjustment factor.

Q. What data does Staff use for weather normalization of load?

A. For the regression analysis portion, Staff needs, at a minimum, the daily energy used by each customer class for a two or three year period from the company. While two years of data is sufficient for normal periods, three years is preferred if there is an unusual event in one year that affects usage, such as a pandemic lockdown or a sharp economic downturn. This information is then analyzed against daily weather from the Midwestern Regional Climate Center to develop daily "normal" weather.

To apply the results of the regression analysis to the actual billing information, Staff needs the meter read dates for each bill cycle for 12 revenue months, and the energy used by each studied customer class for each bill cycle for those 12 revenue months.

Q. What data does Staff use for weather normalization of a company's hourly load requirement at transmission?

A. Staff uses the data Evergy provides as part of its filing requirements under 20 CSR 4240-3.190(1)(C), the daily weather from the Midwestern Regional Climate Center, an estimate of system losses, and the Staff's estimate of the Company's normalized sales plus an estimate of weather normalized sales for resale or wholesale. It's important to note that the Staff's estimate of the Company's normalized sales uses the monthly weather adjustment factors discussed above, and that the processes to estimate the weather normalized sales for resale or wholesale is identical to, and requires the same information as, the weather

normalization of a customer class's load above. The estimate of system losses is provided by other Staff witnesses.

Q. What data does Staff use to determine customer class CP and NCP data?

A. Staff typically uses weather normalized hourly load data for each studied customer class and isolated for each voltage level at which they are served (i.e. primary, secondary, sub-transmission, or transmission level voltage) and demand loss factors to account for the different losses between each voltage level in conjunction with the results of the weather normalization of a company's hourly load requirement at transmission to determine customer class CPs.

For NCPs, Staff uses regression analysis of maximum daily hourly load used by each studied customer class, isolated for each voltage level at which they are served, for a two or three year period and daily weather from the Midwestern Regional Climate Center. Staff also uses energy loss factors to account for the different losses between each voltage level.

Q. Has Staff been able receive sufficient data in order to determine weather normalized load and peaks?

A. Staff has typically been able to work with the available information to determine an approximation of the necessary information for the studied customer classes. In the prior rate case, ER-2022-0130,[1] I had noted the difficulty in obtaining information and the non-responsiveness of the data request responses in my direct testimony.[2] Ultimately, due to the delays in receiving data and the needs of providing other Staff witnesses information, Staff

[1] ER-2022-0130 was consolidated with ER-2022-0129.
[2] Direct Testimony of Michael L. Stahlman, ER-2022-0129 and ER-2022-0130 (June 8, 2022) p. 4, l. 8 through p. 6, l. 17.

used unadjusted load research sample customer usage in the prior case for its weather normalization.

Q. Did Staff use its typical method of determining CPs and NCPs in the most recent rate case?

A. No. Evergy has been unable to provide information on the customer class loads isolated by voltage level or data to properly scale the separate customer classes to system load. This issue was also noted in the Surrebuttal Testimony of Robin Kliethermes in Case Number ER-2016-0285.[3] Instead, Staff Witness Sarah L.K. Lange relied on the studied class usage reported by Evergy.

Q. Has Evergy provided in past rate cases the data necessary to differentiate how different rate schedules or rate codes within a studied class react to changes in weather?

A. No. Because the data Staff has received is at major class levels (e.g. all Residential customers combined rather than separate residential rate classes), Staff must assume that all customers in a studied class had the same response to weather, and generally used energy consistent with the class load shape.

Q. Has Evergy provided in past rate cases the data necessary to align weather response to particular days, such as weekends versus weekdays?

A. No. Under historic rate structures, it has not been relevant to consider the day of the week on which energy is consumed. Weather response is broadly calculated by month, and billing cycle customer usage is weather normalized based on a simple proration of the

[3] "KCPL's load research data is not designed to produce class NCP and CP at the different voltage levels within a rate group where customers are served at different voltage levels, such as Large Power Service ("LPS") or Large General Service ("LGS"). Staff understands that this data only produces a CP and NCP for the rate group as whole" (p. 7 l. 22 – p. 8 l. 2).

energy consumed in a billing cycle and the number of days of each billing cycle within a calendar month.

Q. Will the data Evergy provided in the past allow Staff to evaluate the responsiveness to weather of energy sold during defined time periods, or energy sold on days exempted from on-peak rates?

A. No. The existing weather normalization process and data requirements assume that all customers in a given class (Residential, Small General Commercial, Small General Industrial, Large General Commercial, Large General Industrial, Large Power Commercial, Large Power Industrial, and Lighting) will respond the same to weather in a given calendar month, and that adjustment is applied to the usage in a given billing month. As discussed further by Staff witness Sarah L.K. Lange, given the differences between billing months, billing cycles, and calendar months, Staff would need more detailed information to determine the revenue and billing determinants under highly-differentiated time-based rate plans, as well as for studying a cost basis for TOU rate differentials.

Q. Will these practices result in creation of weather factors that are reasonably applicable to weather normalization of usage on time-based rate schedules?

A. The residential peak adjustment rate schedules for both EMM and EMW are structured similar to legacy rate structures. The responsiveness of the total amount of energy consumed in a billing cycle can be assumed to be comparable to that under legacy rate structures. Further, the time-based rate differential is relatively small, and the day of the week on which consumption occurs are irrelevant. However, Staff would require data on the energy use by these customers distinct from the customers served on other more-differentiated rate schedules.

The highly-differentiated Evergy rate schedules, on which approximately 16% of Evergy residential customers take service at this time,[4] were designed in anticipation that customers' weather responsiveness would vary from that of other customers due to the imposition of significant pricing differentials based on the time of the day and the day of the week. Weather normalization of customer usage on the remaining time-based rate plans will require hourly customer usage (and customer counts) by rate code.

Q. Has Staff or Evergy accounted for the changes in customers in a studied rate class when performing weather normalization?

A. No.[5] Staff reviewed these changes in prior cases and did not find significance in the number of customers in the data. This could be in part that the usage for the major classes are estimated, but also that the changes in customer counts are relatively minor in a given period.

Q. Would Staff expect changes of customers in a studied rate class to become significant in the weather normalization if reviewing on a rate code basis?

A. Potentially yes. As a review of customer usage becomes more focused on smaller groups of customers, and if rate codes both allow more frequent switching and financially incent more frequent switching, changes in the number of customers in a rate code over the studied period will impact estimation of customer response to weather, unless controlled for.

Q. Please summarize your testimony.

[4] Evergy weekly report on active customers on TOU Rates as of December 4, 2023, filed in EW-2023-0199.
[5] The number of customers is a factor in natural gas cases but not in electric cases.

A. Evergy should possess data, due to its use of AMI meters and presumptively providing its customers with accurate bills, which could improve both Evergy's and Staff's estimates of weather normalized load and peaks. This information would improve Staff's estimates of weather normalized load and peaks, and is necessary for the study of weather-responsiveness of each rate code. This, in turn is needed for weather normalization of revenues and billing determinants at a rate-code level, which is necessitated by the emergence of significant numbers of customers on time-based rates. This information will also improve the quality of studies of CCOS and rate design.

Q. Does Staff have any recommendations?

A. Yes. Therefore, Staff recommends that the Commission direct Evergy to provide any usable hourly customer usage information by rate code along with the customer count information, and 15 minute on-peak period demand determinants by rate code for non-residential rate schedules, as further discussed and qualified by Staff Witness's Sarah L.K. Lange in her rebuttal testimony section entitled, "Recommended Path Forward."

Q. Does this conclude your testimony?

A. Yes it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Requests for Customer Account Data Production from Evergy Metro, Inc. d/b/a Evergy Missouri Metro and Evergy Missouri West, Inc. d/b/a Evergy Missouri West	)))))	Case No. EO-2024-0002

AFFIDAVIT OF MICHAEL L. STAHLMAN

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW MICHAEL L. STAHLMAN and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony of Michael L. Stahlman*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

MICHAEL L. STAHLMAN

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 14th day of December 2023.

DIANNA L. VAUGHT
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: July 18, 2027
Commission Number: 15207377

Notary Public

Michael L. Stahlman

Education

2009	M. S., Agricultural Economics, University of Missouri, Columbia.
2007	B.A., Economics, Summa Cum Laude, Westminster College, Fulton, MO.

Professional Experience

2010 -	Regulatory Economist, Missouri Public Service Commission
2007 – 2009	Graduate Research Assistant, University of Missouri
2008	Graduate Teaching Assistant, University of Missouri
2007	American Institute for Economic Research (AIER) Summer Fellowship Program
2006	Price Analysis Intern, Food and Agricultural Policy Research Institute (FAPRI), Columbia, MO
2006	Legislative Intern for State Representative Munzlinger
2005 – 2006	Certified Tutor in Macroeconomics, Westminster College, Fulton, MO
1998 – 2004	Engineering Watch Supervisor, United States Navy

Expert Witness Testimony

Union Electric Company d/b/a AmerenUE GR-2010-0363
In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Natural Gas Service Provided to Customers in the Company's Missouri Service Area

Union Electric Company d/b/a Ameren Missouri GT-2011-0410
In the Matter of the Union Electric Company's (d/b/a Ameren Missouri) Gas Service Tariffs Removing Certain Provisions for Rebates from Its Missouri Energy Efficient Natural Gas Equipment and Building Shell Measure Rebate Program

KCP&L Great Missouri Operations Company EO-2012-0009
In the Matter of KCP&L Greater Missouri Operations Company's Notice of Intent to File an Application for Authority to Establish a Demand-Side Programs Investment Mechanism

Union Electric Company d/b/a Ameren Missouri EO-2012-0142
In the Matter of Union Electric Company d/b/a Ameren Missouri's Filing to Implement Regulatory Changes Furtherance of Energy Efficiency as Allowed by MEEIA

Kansas City Power & Light Company EO-2012-0323
In the Matter of the Resource Plan of Kansas City Power & Light Company

KCP&L Great Missouri Operations Company EO-2012-0324
In the Matter of the Resource Plan of KCP&L Greater Missouri Operations Company

Kansas City Power & Light Company EO-2012-0135
KCP&L Great Missouri Operations Company EO-2012-0136
In the Matter of the Application of Kansas City Power & Light Company [KCP&L Great Missouri Operations Company] for Authority to Extend the Transfer of Functional Control of Certain Transmission Assets to the Southwest Power Pool, Inc.

Kansas City Power & Light Company, KCP&L Great Missouri Operations Company, and Transource Missouri — EA-2013-0098, EO-2012-0367
In the Matter of the Application of Transource Missouri, LLC for a Certificate of Convenience and Necessity Authorizing it to Construct, Finance, Own, Operate, and Maintain the Iatan-Nashua and Sibley-Nebraska City Electric Transmission Projects

Kansas City Power & Light Company
KCP&L Great Missouri Operations Company — EU-2014-0077
In the Matter of the Application of Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company for the Issuance of an Accounting Authority Order relating to their Electrical Operations and for a Contingent Waiver of the Notice Requirement of 4 CSR 240-4.020(2)

Kansas City Power & Light Company — EO-2014-0095
In the Matter of Kansas City Power & Light Company's Notice of Intent to File an Application for Authority To Establish a Demand-Side Programs Investment Mechanism

Veolia Energy Kansas City, Inc — HR-2014-0066
In the Matter of Veolia Energy Kansas City, Inc for Authority to File Tariffs to Increase Rates

Grain Belt Express Clean Line, LLC — EA-2014-0207
In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing It to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood - Montgomery 345 kV Transmission Line

Union Electric Company d/b/a Ameren Missouri — ER-2014-0258
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service

Empire District Electric Company — ER-2014-0351
In the Matter of The Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area

Kansas City Power & Light Company — ER-2014-0370
In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service

Kansas City Power & Light Company — EO-2014-0240
In the Matter of Kansas City Power & Light Company's Filing for Approval of Demand-Side Programs and for Authority to Establish a Demand-Side Programs Investment Mechanism

KCP&L Great Missouri Operations Company — EO-2014-0241
In the Matter of KCP&L Greater Missouri Operations Company's Filing for Approval of Demand-Side Programs and for Authority to Establish a Demand-Side Programs Investment Mechanism

Ameren Transmission Company of Illinois EA-2015-0146
In the Matter of the Application of Ameren Transmission Company of Illinois for Other Relief or, in the Alternative, a Certificate of Public Convenience and Necessity Authorizing it to Construct, Install, Own, Operate, Maintain and Otherwise Control and Manage a 345,000-volt Electric Transmission Line from Palmyra, Missouri to the Iowa Border and an Associated Substation Near Kirksville, Missouri

Empire District Electric Company ER-2016-0023
In the Matter of The Empire District Electric Company's Request for Authority to Implement a General Rate Increase for Electric Service

KCP&L Great Missouri Operations Company ER-2016-0156
In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority to Implement a General Rate Increase for Electric Service

Kansas City Power & Light Company ER-2016-0285
In the Matter of Kansas City Power & Light Company's Request for Authority to Implement A General Rate Increase for Electric Service

Union Electric Company d/b/a Ameren Missouri ER-2016-0179
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service

Grain Belt Express Clean Line, LLC EA-2016-0358
In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing it to Construct, Own, Operate, Control, Manage and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood-Montgomery 345kV transmission line.

Spire Missouri, Inc. GR-2017-0215 and GR-2017-0216
In the Matter of Spire Missouri, Inc.'s Request to Increase Its Revenues for Gas Service

Liberty Utilities GR-2018-0013
In the Matter of Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities' Tariff Revisions Designed to Implement a General Rate Increase for Natural Gas Service in the Missouri Service Areas of the Company

Spire Missouri, Inc. GO-2019-0058 and GO-2019-0059
In the Matter of Spire Missouri, Inc. d/b/a Spire's Request to Decrease [Increase] WNAR

Grain Belt Express Clean Line LLC EM-2019-0150
Invenergy Transmission LLC
Invenergy Investment Company LLC
In the Matter of the Joint Application of Invenergy Transmission LLC, Invenergy Investment Company LLC, Grain Belt Express Clean Line LLC and Grain Belt Express Holding LLC for an Order Approving the Acquisition by Invenergy Transmission LLC of Grain Belt Express Clean Line LLC

Union Electric Company d/b/a Ameren Missouri GR-2019-0077
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase its Revenues for Natural Gas Service

Union Electric Company d/b/a Ameren Missouri ER-2019-0335
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Decrease Its Revenues for Electric Service

Empire District Electric Company ER-2019-0374
In the Matter of The Empire District Electric Company's Request for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in its Missouri Service Area

Union Electric Company d/b/a Ameren Missouri EA-2020-0371
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 20 CSR 4240-3.105

Spire Missouri, Inc. GR-2021-0108
In the Matter of Spire Missouri Inc.'s d/b/a Spire Request for Authority to Implement a General Rate Increase for Natural Gas Service Provided in the Company's Missouri Service Areas

Union Electric Company d/b/a Ameren Missouri ER-2021-0240
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Electric Service

Union Electric Company d/b/a Ameren Missouri GR-2021-0241
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Natural Gas Service

The Empire District Electric Company ER-2021-0312
In the Matter of the Request of The Empire District Electric Company d/b/a Liberty for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in its Missouri Service Area

The Empire District Gas Company GR-2021-0320
In the Matter of The Empire District Gas Company's d/b/a Liberty Request to File Tariffs to Change its Rates for Natural Gas Service

Ameren Transmission Company of Illinois EA-2022-0099
In the Matter of the Application of Ameren Transmission Company of Illinois for a Certificate of Convenience and Necessity Under Section 393.170.1, RSMo. Relating to Transmission Investments in Southeast Missouri

Evergy Metro, Inc d/b/a Evergy Missouri Metro ER-2022-0129
In the Matter of Evergy Metro, Inc. d/b/a Evergy Missouri Metro's Request for Authority to Implement A General Rate Increase for Electric Service

Evergy Missouri West, Inc. d/b/a Evergy Missouri West ER-2022-0130
In the Matter of Evergy Missouri West, Inc. d/b/a Evergy Missouri West's Request for Authority to Implement A General Rate Increase for Electric Service

Spire Missouri, Inc. GR-2022-0179
In the Matter of Spire Missouri, Inc. d/b/a Spire's Request for Authority to Implement a General Rate Increase for Natural Gas Service Provided in the Company's Missouri Service Areas

Union Electric Company d/b/a Ameren Missouri EA-2022-0245
In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Approval of a Subscription-Based Renewable Energy Program

Union Electric Company d/b/a Ameren Missouri ER-2022-0337
In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Electric Service

Grain Belt Express Clean Line LLC EA-2023-0017
In the Matter of the Application of Grain Belt Express LLC for an Amendment to its Certificate of Convenience and Necessity Authorizing it to Construct, Own, Operate, Control, Manage, and Maintain a High Voltage, Direct Current Transmission Line and Associated Converter Station

Union Electric Company d/b/a Ameren Missouri EA-2023-0286
In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and Certificates of Public Convenience and Necessity Authorizing it to Construct Renewable Generation Facilities

Selected Manuscripts

Stahlman, Michael and Laura M.J. McCann. "Technology Characteristics, Choice Architecture and Farmer Knowledge: The Case of Phytase." Agriculture and Human Values (2012) 29: 371-379.

Stahlman, Michael. "The Amorality of Signals." Awarded in top 50 authors for SEVEN Fund essay competition, "The Morality of Profit."

Selected Posters

Stahlman, Michael, Laura M.J. McCann, and Haluk Gedikoglou. "Adoption of Phytase by Livestock Farmers." Selected poster at the American Agricultural Economics Association Annual Meeting, Orlando, FL, July 27-29, 2008. Also presented at the USDA/CSREES Annual Meeting in St. Louis, MO in February 2009.

McCann, Laura, Haluk Gedikoglu, Bob Broz, John Lory, Ray Massey, and Michael Stahlman. "Farm Size and Adoption of BMPs by AFOs." Selected poster at the 5th National Small Farm Conference in Springfield, IL in September 2009.