Exhibit No.:	
Issue(s):	*Energy Efficiency Adjustment, Lighting Revenue*
Witness:	*Hari K Poudel, PhD*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Direct Testimony*
Case No.:	*ER-2024-0261*
Date Testimony Prepared:	*July 2, 2025*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

TARIFF AND RATE DESIGN DEPARTMENT

DIRECT TESTIMONY

OF

HARI K. POUDEL, PhD

EMPIRE DISTRICT ELECTRIC COMPANY, d/b/a LIBERTY

CASE NO. ER-2024-0261

Jefferson City, Missouri
July 2025

** Denotes Confidential Information **

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DIRECT TESTIMONY

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HARI K. POUDEL, PhD

EMPIRE DISTRICT ELECTRIC COMPANY,
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CASE NO. ER-2024-0261

Q. Please state your name and business address.

A. My name is Hari K. Poudel, and my business address is P.O. Box 360, Jefferson City, Missouri 65102.

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

A. I am employed by the Missouri Public Service Commission ("Commission") as an Economist in the Tariff/Rate Design Department in the Industry Analysis Division.

Q. Please describe your educational and work background.

A. I received a PhD in Public Policy from the University of Missouri - Columbia and another master's degree in Agricultural Economics from the University of Hohenheim, Germany. I also received a graduate certificate in Public Utility Regulation & Economics from the New Mexico State University. In January of 2020, I began working for the Missouri Department of Health and Senior Services as a research and data analyst. I was employed with the Division of Community and Public Health from January 2020 until October 2021. I started my career with the Commission as an Economist in October 2021.

Q. Have you previously testified in proceedings before the Commission?

A. Yes. I have provided written testimony and testified in multiple cases before the Commission. Please see Schedule HKP-d1.

EXECUTIVE SUMMARY

Q. What is the purpose of your direct testimony?

A. The purposes of my direct testimony are:

- to perform the energy efficiency annualization adjustment calculation; and,

- to support Staff's revenue adjustment for Empire in relation to the billing determinants for the lighting class rate schedules.

ENERGY EFFICIENCY ADJUSTMENT

Q. What is the energy efficiency adjustment and why is it used?

A. The energy efficiency adjustment normalizes the billing units used to calculate the revenue requirement for Empire. The goal of the energy efficiency adjustment is to account for the annualized impact of energy efficiency measures installed during the update period. This modification adjusts for the decrease in billing units and related revenue that Empire encountered due to its implementation of energy efficiency measures approved by the Commission pursuant to the Missouri Energy Efficiency Investment Act ("MEEIA").

Q. How was the energy efficiency adjustment made?

A. Staff calculated the energy efficiency adjustment based on the number of end-use measures installed during the update period.[1] Staff calculated adjustments for Residential Service ("Res"), Small General Service ("SGS"), Large General Service ("LGS"), Small Primary Service ("SPS"), and Large Power Service ("LPS").

[1] October 2023 through September 2024.

The first input required for the adjustment analysis is the deemed energy savings (kWh) by end-use category by rate class.[2] The total deemed savings are calculated from these end-use measures installed in each category of saving of the update period.

The second input is the installed Kilowatt hour ("kWh") savings for each calendar month. Installed savings represent the kWh billing units that Empire will no longer meter or bill due to the energy efficiency measures installed during the update year.

For the energy efficiency adjustment, a half-month convention is used to estimate the energy savings in each month of the installation. A half-month convention assumes that all energy-efficient capacity was installed halfway between the beginning and end of the month, which is mathematically similar to assuming that investments were distributed uniformly throughout the month. The same process is used across other utilities in Missouri.[3] Each end-use measure is then multiplied by the applicable monthly load shape. The load pattern reflects the seasonality of the savings.

The difference between the actual monthly energy efficiency savings realized and the annualized energy efficiency savings for each end-use measure category and rate class is the calendar month energy efficiency annualization adjustment.

Q. Does Staff perform energy efficiency adjustments by rate code for both residential and non-residential rate classes?

A. Yes. Staff performed an energy efficiency adjustment per rate code for both residential and non-residential rate classes. Staff performed adjustment analyses for the SGS, LGS, and SPS classes at the rate code level.

[2] Responses to Staff Data Request ("DR") 0328 and DR 0328.2.
[3] Docket Nos. ER-2022-0337 and ER-2024-0189.

Empire's response to Staff DR 0328 indicates that residential data is not categorized by rate codes, since 99.50% of residential customers and kWh sales are billed under a single rate code-Time Choice Residential Rate Plan ("TC-RG"). Therefore, Staff conducted an energy efficiency adjustment for the residential rate class at the aggregate level. As per the response to Staff DR 0328.1, Empire currently does not track kWh savings on a per-customer basis for the LPS rate class. Therefore, Staff performed the LPS's energy efficiency adjustment at the aggregate level. However, adjustments for other non-residential rate classes were carried out according to their individual rate codes.

Q. What is Staff's recommended energy efficiency adjustment to be applied to the level of current revenues and billing determinants?

A. Staff's total energy efficiency adjustment is ** [redacted] ** for the update period ending September 30, 2024.

Q. Through this testimony, do you describe the development of a work product that you provided to other Staff witnesses for the development of an issue in this case?

A. Yes. Development of the energy efficiency adjustment is the result of the process described in this testimony, which Staff witnesses Kim Cox and Marina Gonzales use to determine total revenue billing determinants. To represent the effect of the energy efficiency adjustment on Empire's revenue, the energy efficiency adjustment is applied to revenue billing determinants.

LIGHTING REVENUES AND BILLING DETERMINANTS

Q. What are billing determinants?

A. Billing determinants are what a revenue requirement is divided by to produce rates. Billing determinants are also the combination of components to which rates are applied

to calculate the customer's bill. Examples of billing determinant components are customer charge, usage, and demand.

Q. What billing determinants are used to set rates for lighting rate schedules?

A. Specifically, for lighting rate schedules, the billing determinants used for the metered lighting rate schedules are customer charge and energy usage.[4]

Q. What process was used to estimate test period revenues and billing determinants by lighting rate schedule?

A. Empire provided the billing determinants by class, rate code, and then item number, which is the identifier for each charge type within a lighting class. For the test year, Staff calculated revenues for each lighting class and each item number. This was done by multiplying the units provided for each lighting item number by the verified tariff rate to come up with a monthly revenue for each rate code and item number.[5] The summation of the monthly revenues provides the total annual revenue for each lighting rate schedule.

Staff updated test year lighting revenues by making adjustments to reflect the change in usage through the 12-months ending September 30, 2024, for lighting rate schedule revenues. The update period revenue adjustment is calculated by subtracting test year revenue from the update period revenue.

Q. Did Staff adjust the lighting usage for weather-sensitivity?

A. No. The lighting class is not considered to be weather sensitive. The determinants for both the metered and non-metered lighting classes remain relatively consistent regardless of weather, because the lighting classes are subject to regular schedules to

[4] Additional charges are applied at specific rate classes as detailed in the respective Tariff schedule and reflected in the respective workbook for each service schedule: Miscellaneous Lighting ("MS"), Special Lighting Service ("LS"), Private Lighting ("PL"), and Municipal Street Lighting ("SPL").
[5] Rates for the SPL and PL rate schedules are billed per lamp rather than per kWh.

serve public places in all incorporated municipalities and other governmental agencies through long-term contracts.

Q. Does the currently effective Empire tariff include non-metered fixtures in the lighting rate schedule?

A. Yes, Empire's currently effective Municipal Street Lighting Service Schedule includes Non-Metered Fixtures. The monthly energy for each type and size of lamp is determined by multiplying the annual kWh by the monthly usage factor listed in the Revised Sheet No. 1.

Q. What information was available to Staff to estimate test period revenues and billing determinants by lighting rate schedule?

A. Staff relied on data provided in Empire's workpapers that were delivered initially on November 13, 2024, via SharePoint, and were supplemented through several responses to data requests.[6] Staff made manual adjustments to implement Empire's adjustments due to Empire's changes in the billing cycle.[7]

Q. Does Staff recommend removing any lighting tariff?

A. Yes. Staff recommends removing Empire's Municipal Street Lighting Emitting Diode ("LED") Tariff Schedule SPL-LED (Tariff Section 3, Sheet No. 1b) is no longer in place.[8] Additionally, no customers are on this tariff schedule.[9]

[6] Refer to Empire responses to Data Request Nos. 0245 A, B, 0330, 0333, and 0410.
[7] Liberty response to inquiry about determination of energy for Schedule SPL (Non- Metered): "SPL is part of our bill cycle 21 so up until January 2024, they were billed at the beginning of the month for the previous month's usage…We changed our cycle 21 bill date in January so in our raw billing determinant files you have been looking it there will actually be two sets of bills in January 2024, for cycle 21. One billed at the beginning of the month for December's usage and then bills that went out at the end of January for January's usage. We billed through the end of the month for this cycle through March 2024 and then in April 2024 it went back to billing at the beginning of the month for the prior month's usage."
[8] Response to Staff DR 0290.
[9] "Incandescent Lamp Sizes (No New Installation Allowed) … 4,000 lumen." Tariff Section 3, Sheet No. 1. Liberty's email (04/09/2025) confirmed that "No units were reported in the files for that lamp".

CONCLUSION AND RECOMMENDATION

Q. What is your recommendation concerning the energy efficiency adjustment, the lighting revenues, and the billing determinants?

A. I recommend the Commission rely upon the energy efficiency adjustment, lighting class revenues, and determinants that Staff has provided for incorporation into Staff's revenue requirement and rate design.

Q. Does this conclude your direct testimony?

A. Yes. It does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

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	)))))	Case No. ER-2024-0261

AFFIDAVIT OF HARI K. POUDEL, PhD

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW HARI K. POUDEL, PhD and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Hari K. Poudel, PhD*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

HARI K. POUDEL, PhD

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 1st day of July 2025.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2029
Commission Number: 12412070

Notary Public

CREDENTIALS AND CASE PARTICIPATION OF HARI K. POUDEL, PhD

Current Position

Currently, I work for the Missouri Public Service Commission ("Commission") as an Economist in the Tariff/Rate Department of the Industry Analysis Division. The Department of Tariff and Rate Design takes part in and offers advice on matters filed with the Commission, such as rate, complaint, application, territorial agreements, sale, and merger. The Department also handles rate design, weather variables, and weather normalization tasks and offers technical assistance. I am responsible for using quantitative economic techniques and statistical analysis to address energy-related challenges that have an effect on utility ratemaking. I am also responsible of recommendations for the Commission based on a various economic analysis of the problems relating to energy and energy efficiency.

Educational Credentials and Work Experience

I received a Doctor of Philosophy in Public Policy from the University of Missouri, Columbia, Missouri in May 2020. I also received a graduate certificate in Public Utility Regulation & Economics from the New Mexico State University in May 2025. In 2008, I received a Master's in Agricultural Economics degree from Hohenheim University in Germany.

I've been employed with the Missouri Public Service Commission since October 25, 2021, in the Tariff/Rate Department of the Industry Analysis Division as a Regulatory Economist. Prior to joining the Commission, I was a Research/Data Analyst for the Missouri Department of Health and Senior Services. I analyzed public health data that directly affects Missourians in my capacity as an analyst.

Testimonies/Memorandum

SN	Case Number	Company Name	Issue
1.	GR-2021-0320	Liberty Utilities	Tariff Compliance
2.	GR-2022-0235	Spire Missouri, Inc.	Weather Normalization Adjustment Rider (WNAR)
3.	ER-2022-0146	Ameren Missouri	Rider Energy Efficient Investment Charge (EEIC)
4.	GT-2022-0233	Liberty Utilities	Weather Normalization Adjustment Rider (WNAR)
5.	ER-2022-0129 & ER-2022-0130	Evergy Metro, Inc. & Evergy Missouri West, Inc.	General Rate Case
6.	ER-2022-0337	Ameren Missouri	365-Day Adjustment, Weather Variables, Weather Normalization, Hourly Load Requirement Energy Efficiency Adjustment
7.	GO-2023-0002	Spire	Weather Normalization Adjustment Rider (WNAR)
8.	GT-2023-0088	Liberty Utilities	Weather Normalization Adjustment Rider (WNAR)
9.	GT-2023-0274	Liberty Utilities	Weather Normalization Adjustment Rider (WNAR)
10.	EA-2023-0286	Ameren Missouri	Economic Feasibility
11.	GT-2024-0054	Liberty Utilities (Midstates Natural Gas)	Weather Normalization Adjustment Rider (WNAR)
12.	GT-2024-0055	The Empire District Gas Company	Weather Normalization Adjustment Rider (WNAR)
13.	GR-2024-0107	Ameren Missouri	Weather Normalization Adjustment Rider (WNAR)
14.	EO-2023-0136	Ameren Missouri	Throughput Disincentive, Marginal Rate Analysis, Rebound Effect, Rate Case Annualization
15.	EO-2023-0369 & EO-2023-0370	Evergy Metro, Inc. & Evergy Missouri West, Inc.	MEEIA (Throughput Disincentive, Rebound Effect, Rate Case Annualization)
16.	ER-2024-0189	Evergy Missouri West, Inc.	MEEIA, Net Margin Rate, Economic Development Riders, PISA Compliance
17.	GR-2024-0106	Liberty Utilities	Weather Normalization, 365 Days-Adjustment

SN	Case Number	Company Name	Issue
18.	ER-2024-0319	Ameren Missouri	Energy Efficiency Adjustment (MEEIA), Marginal Rate Analysis, Rebound Effect, Economic Development Riders
19.	ER-2024-0319	Ameren Missouri	Rate Design
20.	EA-2024-0292	Evergy Missouri West, Inc.	Economic Feasibility