Exhibit No. 202

MoPSC Staff – Exhibit 202
Alan J. Bax
Direct Testimony
File Nos. ER-2022-0129 & ER-2022-0130

Exhibit No.:	
Issue(s):	*System Energy Losses Jurisdictional Allocation Factors Loss_Study-FAC-Voltage Adjustment Factors*
Witness:	*Alan J. Bax*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Direct Testimony*
Case Nos.:	*ER-2022-0129 and ER-2022-0130*
Date Testimony Prepared:	*June 8, 2022*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

DIRECT TESTIMONY

OF

ALAN J. BAX

Evergy Metro, Inc. d/b/a Evergy Missouri Metro
Case No. ER-2022-0129

Evergy Missouri West, Inc. d/b/a Evergy Missouri West
Case No. ER-2022-0130

Jefferson City, Missouri
June 2022

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DIRECT TESTIMONY OF

ALAN J. BAX

Evergy Metro, Inc. d/b/a Evergy Missouri Metro
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DIRECT TESTIMONY

OF

ALAN J BAX

Evergy Metro, Inc. d/b/a Evergy Missouri Metro
Case No. ER-2022-0129

Evergy Missouri West, Inc. d/b/a Evergy Missouri West
Case No. ER-2022-0130

Q. Please state your name and business address?

A. Alan J. Bax, 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 Associate Engineer in the Engineering Analysis Department of the Industry Analysis Division.

Q. Please describe your educational and work background.

A. My educational and work background is summarized in Schedule AJB-d1

Q. Are you a member of any professional organizations?

A. Yes, I am a member of the Institute of Electrical and Electronic Engineers (IEEE).

Q. Have you previously filed testimony before the Commission?

A. Yes. My case participation history with the Commission is listed in Schedule AJB-d2.

EXECUTIVE SUMMARY

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to describe my calculation of the following inputs to Staff's direct case:

- System energy line loss factors,
- Jurisdictional allocation factors for demand and energy, and
- Voltage Adjustment Factors (VAFs).

Q. To which rate case is the following direct testimony applicable?

A. I calculated inputs for both the Evergy Missouri Metro ("Evergy Metro") and Evergy Missouri West ("Evergy West") cases.

Q. Through this testimony, do you describe the development of workproduct that you provided to another Staff witness for the development of an issue?

A. Yes. I provided system energy loss factors to Staff witness Michael L. Stahlman for his development of hourly loads that are subsequently considered in Staff's fuel model. I provided jurisdictional demand and energy allocation factors to Staff witness Keith Majors for use in Staff's EMS run, which is utilized in allocating related demand and energy revenues and expenses to the Missouri retail jurisdiction. Finally, I provided the calculated VAFs to Staff witness Amanda Conner, who utilized these VAFs in conjunction with the determination of Fuel Adjustment Rates ("FARs") that are reflected in the respective Fuel Adjustment Clauses ("FACs") of Evergy Metro and Evergy West.

Q. Please summarize the results of your analyses.

A. A summary of the results of my calculations are included in Schedule AJB-d3.

SYSTEM ENERGY LOSSES

Q. What are system energy losses?

A. System energy losses are inherent in the production, transmission and distribution of electricity, largely occurring in the electrical equipment (e.g., transmission and distribution lines, transformers, etc.) between a utility's generating sources and their respective customers' meters. For example, the losses associated with the heat produced in transmitting and distributing electricity along associated conductors. In addition, small fractional amounts of energy, either stolen (diversion) or not metered, are included in my calculation of system energy losses.

Q. How are system energy losses determined?

A. The basis for calculating system energy losses is that the Net System Input ("NSI") equals the sum of "Retail Sales", "Wholesale Sales", "Company Use," and "System Energy Losses." This can be expressed mathematically as:

NSI = Retail Sales + Wholesale Sales + Company Use + System Energy Losses. NSI, Company Use, Retail Sales and Wholesale Sales are known quantities; therefore, system energy losses may be calculated as follows:

System Energy Losses = NSI – Retail Sales - Wholesale Sales – Company Use. The system energy loss factor is the ratio of system energy losses to NSI:

System Energy Loss Factor = (System Energy Losses ÷ NSI)

Q. How is NSI determined?

A. In addition to the relationship expressed in the equation above, NSI is also equal to the sum of net generation and the net interchange. Net generation is the total energy output of each generating station minus the energy consumed internally to enable its production of electricity at each plant. The output of each generation plant is continuously monitored and

metered. Net interchange is the difference resulting from netting off-system purchases and off-system sales, and is also similarly monitored.

Q. What are Retail Sales, Wholesale Sales and Company Use and how are these values determined?

A. The Commission sets cost of service based rates for a respective utility's Missouri retail customers. However, not all sales are necessarily associated with a utility's provision of service to its Missouri retail customers. Both Evergy Metro and Evergy West have retail and wholesale customers. In addition, Evergy Metro has retail customers in Kansas as well as Missouri. Retail sales in Missouri, retail sales in Kansas, and wholesale sales (under the jurisdiction of the Federal Energy Regulatory Commission ("FERC") are described as sales occurring in three separate jurisdictions. Retail Sales and Wholesale Sales represent the jurisdictional energy metered within a particular utility's system. In these cases, Evergy Metro has three applicable jurisdictions: a wholesale jurisdiction[1] and retail jurisdictions in the states of Missouri and Kansas, while Evergy West has two jurisdictions: a wholesale jurisdiction and a single retail jurisdiction in Missouri. Company Use is the electricity consumed at each of the non-generation facilities, such as the respective corporate office buildings, for both Evergy Metro and Evergy West.

Q. What are the resultant system energy loss factors for Evergy Metro and Evergy West?

A. Evergy has yet to provide appropriate data in order to perform this calculation of system energy losses as described above. The system energy line loss factors for

[1] Evergy Metro has wholesale customers in both Missouri and Kansas as well. However, for the purposes of my testimony, they are combined into one.

Evergy Metro and Evergy West indicated below are based on an evaluation of a line loss study provided, in the Direct Testimony of Evergy witness Linda Nunn. The data contained in this loss study was based on information collected on Evergy Metro and Evergy West respective electric systems during calendar year 2020. The system energy loss factors for Evergy Metro and Evergy West are as follows:

Metro - 0.0609
West - 0.0669

Which Staff witness used your calculated system energy loss factors?

I provided my calculated system energy loss factors to Staff witness Michael L. Stahlman.

Q. Please describe the existing issues with acquiring appropriate data.

A. In prior rate cases, Evergy has readily provided a response to a Staff Data Request seeking information on "Net Interchange." However, in this case I was referred to the Response to Staff Data Request No. 0061 in each respective case as Evergy's Response to Staff Data Request No. 206 in ER-2022-0129 and Staff Data Request No. 205 in ER-2022-0130. Furthermore, the data I desired was not entirely included here. In a subsequent phone call conducted on May 10, I asked to be provided a clarification as to the relevance of Evergy's Response to Staff Data Request No. 61 as it supposedly pertained to desired data sought. Evergy indicated its understanding of the clarification discussed and expressed a desire to receive a new data request in order to receive desired information. However, on the day following the date on which its response was due to the new data requests in the respective cases, Counsel for Evergy emailed Staff Counsel requesting further contact in reportedly providing desired information. Hence, I do not at this time have sufficient data to independently

verify the Company's loss numbers used above. Any updates to my recommendation of system energy losses for Evergy Metro and Evergy West will be addressed in rebuttal.

JURISDICTIONAL ALLOCATIONS

Q. Please describe the jurisdictions applicable to this case.

A. The Commission sets cost of service based rates for a utility's Missouri retail customers; however, not all the costs incurred by a utility are necessarily associated with its provision of service to its Missouri retail customers. Both Evergy Metro and Evergy West have retail and wholesale customers. In addition, Evergy Metro has retail customers in Kansas as well as Missouri. Retail sales in Missouri, retail sales in Kansas and wholesale sales (under the jurisdiction of the Federal Energy Regulatory Commission ("FERC") are described as sales occurring in three separate jurisdictions.

Q. Please define the phrase "jurisdictional allocation".

A. Some costs incurred in serving customers in a particular jurisdiction may be directly assigned to that jurisdiction. The costs that are not directly assigned to a particular jurisdiction are allocated among the various applicable jurisdictions. Jurisdictional allocation refers to the process by which demand-related and energy-related costs are allocated to the applicable jurisdictions of the respective utility. Costs that do not vary significantly over the course of a year, or that do not vary with the amount of energy generated or consumed, such as the capital costs associated with generation and transmission plant, are typically allocated on the basis of demand (i.e. "demand related"). Variable costs, such as fuel and purchased power, are typically allocated on the basis of energy consumption (i.e. "energy related"). Demand-related and energy-related costs are divided between applicable retail and wholesale operations, three jurisdictions in Evergy Metro and two jurisdictions for Evergy West. The application of

a particular allocation factor is dependent upon the types of costs being allocated among the associated jurisdictions.

DEMAND ALLOCATION FACTOR

Q. What is the definition of demand?

A. Demand refers to the rate of electric energy that is delivered to a system to meet the requirements of its customers, generally expressed in kilowatts or megawatts, either at an instant in time or averaged over any designated interval of time.

Q. What is the system peak demand?

A. System peak demand is the largest electric requirement that occurs on a utility's system within a specified period of time (e.g. hour, day, month, season, or year). In my analyses, I used hourly demands.

Q. Please explain the term coincident peak.

A. A coincident peak is the hourly contribution of each of Evergy Metro's three jurisdictions (Missouri Retail, Kansas Retail and Wholesale Operations) and Evergy West's two jurisdictions (Missouri Retail and Wholesale Operations), that occurs coincident to the respective system peak demand, i.e., each individual jurisdiction contributing demand at the time of the corresponding system peak.

Q. What types of costs are allocated on the basis of demand?

A. Capital costs associated with generation and transmission plant, as well as certain operational and maintenance expenses, are allocated on this basis. This is appropriate because generation and transmission are planned, designed and constructed to meet a utility's anticipated demand.

Q. Why use peak demand as the basis for allocations?

A. Peak demand is the largest electric requirement occurring within a specified period of time (e.g., day, month, season, year) on a utility's system. In addition, for planning purposes, an amount must be included for meeting required contingency reserves. Since generation units and transmission lines are planned, designed, and constructed to meet a utility's anticipated system peak demands plus required reserves, the contribution of each individual jurisdiction to these peak demands is the appropriate basis on which to allocate the costs of these facilities.

Q. What methodology did you use to determine the demand allocators?

A. I used what is known as the Four Coincident Peak (4 CP) methodology. A 4 CP method is appropriate for a utility that experiences dominant seasonal demands in the four summer months (June to September) relative to the demands in the other eight months of a calendar year. A utility that experiences similar hourly peaks in both winter and summer months might consider using a 12 CP method. Comparatively, a utility that does not experience similar peaks in both winter and summer months, but instead experiences a peak demand in one particular month within a calendar year may consider utilizing a 1 CP. The monthly demands reported for the months in calendar years 2020 and 2021, which include the test year and the update period for the current cases, are consistent with the monthly demands in the reporting periods associated with the last several rate cases involving Evergy Metro and Evergy West.

Q. What additional information did you consider in recommending using a 4 CP?

A. In various cases, the FERC has utilized three particular tests in its determination of a methodology to employ. The results of these tests are compared to specific ranges identified from prior FERC decisions that have persuaded the FERC in deciding which

methodology is more appropriate. FERC has used these tests to support its adoption of a 4 CP methodology in a number of cases.

Q. Please describe the FERC tests you used in your selection of a CP methodology.

A. The result of the following three tests were calculated.

Test 1 - Computes the difference between the following two percentages:

a) The average of the summer monthly system peaks during the reported peak period as a percentage of the annual peak, (Summer_Avg / Annual Peak) and

b) The average of the system peaks during the remainder of the analyzed period as a percentage of the annual peak. (Winter Avg / Annual Peak)

For calculated differences that fell between 18% and 19%, the FERC typically adopted a 12 CP methodology. For differences that fell between 26% and 31%, the FERC typically adopted a 4 CP methodology.

Test 2 - The average of the twelve monthly peaks in the reporting period as a percentage of the annual peak, (12-Month_Avg / Annual_Peak).

When the resulting percentage fell between 81% and 88%, the FERC typically adopted a 12 CP methodology. When the resulting percentage fell between 78% and 81%, the FERC typically adopted a 4 CP methodology.

Test 3 - The lowest monthly peak as a percentage of the annual peak (Mini/Max).

When the resulting percentage fell between 66% and 81%, the FERC typically adopted a 12 CP methodology. When the resulting percentage fell between 55% and 60%, the FERC typically adopted a 4 CP methodology.

Q. What were the results of the tests you conducted?

A. I applied these tests on the reported monthly demands for Evergy Metro in calendar year 2021, a period of time included within the update period of this case. The result of each test, along with its significance, is as follows:

Test 1 – Summer_Month Avg / Annual Peak – 0.9508
Winter_Month Avg / Annual Peak – 0.6501

The difference between these two ratios of 30.07% is a strong indicator to utilize 4 CP as it is at the high end of the range 26-31 percent highlighted by FERC in cases in which it used a 4 CP method.

Test 2 - 12-Month_Avg / Annual_Peak = .7503

The result of the second test, 75.03%, makes an even stronger indicator in utilizing a 4CP as it lies below the noted range of 78-81% noted by the FERC in cases the FERC adopted a 4CP methodology.

Test 3 – Minimum Monthly Peak / Maximum Monthly Peak - .5501

The result of the third test, 55.01 %, lies at the low end of the range of 55-60% noted by FERC in cases utilizing a 4 CP. Overall, the results of these three tests highly suggest that a 4 CP methodology is appropriate for utilities like Evergy Metro that have dominant seasonal peaks.

Q. Please describe the procedure for calculating the jurisdictional demand allocation factors using the 4 CP methodology.

A. The allocation factor for each applicable jurisdiction respectively for Evergy Metro and Evergy West operating systems was determined using the following process:

a. Identify the peak hourly load on both Evergy Metro and Evergy West operating system respectively in each month for the four - month period June 2021 through September 2021 and sum these hourly peak loads.

b. Identify the corresponding load in each of the applicable jurisdictions identified earlier on both Evergy Metro and Evergy West systems that contributed to the respective system overall system monthly peaks identified in "a" above and sum these loads for each particular jurisdiction.

c. Divide b. above by a. above.

The resultant ratios are the allocation factors for each applicable jurisdiction for the respective Evergy Metro and Evergy West electric system as follows:

EVERGY METRO:

Missouri Retail Jurisdiction:	0.05215
Kansas Retail Jurisdiction:	0.4771
Wholesale Jurisdiction:	0.0014
Total:	1.0000

EVERGY WEST:

Missouri Retail Jurisdiction:	0.9981
Wholesale Jurisdiction:	0.0019
Total:	1.0000

Q. Which Staff witness used your jurisdictional demand allocation factors?

A. I provided these jurisdictional demand allocation factors to Staff witness Keith Majors.

ENERGY ALLOCATION FACTOR

Q. What types of costs were allocated on the basis of energy?

A. Variable expenses, such as fuel and purchased power, along with certain operational and maintenance (O&M) expenses, are allocated to the applicable jurisdictions of both Evergy Metro and Evergy West based on energy consumption.

Q. How did you calculate the energy allocation factor?

A. The energy allocation factor for an individual jurisdiction in Evergy Metro or Evergy West is the ratio of the normalized annual kilowatt-hour (kWh) usage in the particular jurisdiction, during the period July 2020 – June 2021, to the respective Evergy Metro and Evergy West total system kWh usage. Staff also applied adjustments to these normalized kWhs accounting for losses, anticipated growth and certain customer annualizations. Normalized weather adjustments were provided by Staff witness Michael L. Stahlman. The adjustments for growth and certain annulizations were provided by Staff witness Kim Cox.

Q. What are the energy allocation factors you determined in this case?

A. Staff has calculated the following energy allocation factors for the aforementioned applicable jurisdictions, for both Evergy Metro and Evergy West, based on kWh usage data in the test year July 2020 – June 2021, including the aforementioned adjustments:

EVERGY METRO:

Missouri Retail Jurisdiction:	0.5646
Kansas Retail Jurisdiction:	0.4338
Wholesale Jurisdiction:	0.0016
Total:	1.0000

EVERGY WEST:

Missouri Retail Jurisdiction	0.9979
Wholesale Jurisdiction:	0.0021
Total:	1.0000

These jurisdictional energy allocation factors were provided to Staff witness Keith Majors to allocate related costs to the respective applicable jurisdictions for both Evergy Metro and Evergy West.

LOSS STUDY AS IT APPLIES TO THE FUEL ADJUSTMENT CLAUSE

Q. Did Evergy provide a System Energy Loss Study, for Evergy Metro and Evergy West in these cases, on which you relied, in whole or in part, in developing Staff's loss factors for Staff's direct case?

A. Yes, a document entitled "Evergy- 2020 Analysis of System Losses ("Loss Study"), was attached to the Direct Testimony of Evergy witness Linda J. Nunn.

Q. Please provide a brief description of this document.

A. The Loss Study includes information pertaining to both Evergy Metro and Evergy West. The Loss Study is indicated to include an analysis of data pertaining to the operation of both Evergy Metro and Evergy West collected during calendar year 2020, with a preparation date of December 2021.

Q. Why was this Loss Study provided?

A. Both Evergy Metro and Evergy West have initiated and maintained a Fuel Adjustment Clause ("FAC"). In order to remain in compliance with Commission regulation 20 CSR 4240-20.090(13),[2] it was necessary for both Evergy Metro and Evergy West

[2] 20 CSR 4240-20.090(13) Rate Design of the RAM. The design of the RAM rates shall reflect differences in losses incurred in the delivery of electricity at different voltage levels for the electric utility's different rate classes as determined by periodically conducting Missouri jurisdictional system loss studies. …When the electric utility

to submit a current loss study in conjunction with their respective requests to continue a Rate Adjustment Mechanism, i.e. their respective Fuel Adjustment Clauses ("FACs") in the current cases.

Q. What information are you evaluating in the Loss Study?

A. Included in the analysis of line losses reported overall for both Evergy Metro and Evergy West operating systems is a derived loss factor for each of the corresponding operating voltage levels (transmission, primary and secondary) in which Evergy Metro and Evergy West serve its customers.

Q. What are these voltage adjustment factors ("VAFs") for each operating level of the Evergy Metro and Evergy West system?

A. VAFs are determined to account for the energy losses experienced in the delivery of electricity from the generation level to the customer. I determined the VAFs applicable to the transmission, primary and secondary operating voltage levels for both Evergy Metro and Evergy West, as illustrated in Schedule AJB-d4, utilizing information concerning losses and energy sold at each specific voltage level contained in the loss study Evergy provided in its direct filing in these cases:

EVERGY METRO:

$$VAF_{Transmission} - 1.0300$$

$$VAF_{Primary} - 1.0493$$

$$VAF_{Secondary} - 1.0686$$

seeks to continue or modify its RAM, the end of the twelve- (12) month period of actual data collected that is used in its Missouri jurisdictional system loss study must be no earlier than four (4) years before the date the utility files the general rate proceeding seeking to continue or modify its RAM.

EVERGY WEST:

$$VAF_{Transmission} - 1.0300$$

$$VAF_{Primary} - 1.0503$$

$$VAF_{Secondary} - 1.0766$$

Q. What Staff members used these VAFs?

A. These VAFs were provided to Staff witness Amanda Conner for utilization in the respective FARs for Evergy Metro and Evergy West. These FARs will be applied to the individual voltage service classification of a particular customer in the respective Evergy Metro and Evergy West FAC tariffs should the Commission authorize Evergy Metro and/or Evergy West continue utilization of their respective FACs and associated tariffs.

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 Evergy Metro, Inc. d/b/a Evergy Missouri Metro's Request for Authority to Implement a General Rate Increase for Electric Service	))))	Case No. ER-2022-0129
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	))))	Case No. ER-2022-0130

AFFIDAVIT OF ALAN J. BAX

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW ALAN J. BAX and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Alan J. Bax*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Alan J Bax
ALAN J. BAX

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 6th day of June 2022.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin
Notary Public

ALAN J. BAX

I graduated from the University of Missouri - Columbia with a Bachelor of Science degree in Electrical Engineering in December 1995. Concurrent with my studies, I was employed as an Engineering Assistant in the Energy Management Department of the University of Missouri – Columbia from the Fall of 1992 through the Fall of 1995. Prior to this, I completed a tour of duty in the United States Navy, completing a course of study at the Navy Nuclear Power School and a Navy Nuclear Propulsion Plant. Following my graduation from the University of Missouri - Columbia, I was employed by The Empire District Electric Company as a Staff Engineer until August 1999, at which time I began my employment with the Staff of the Missouri Public Service Commission. My current position is an Engineer in the Engineering Analysis Department, within the Industry Analysis Division. I presented in a Peer Review of Power Quality Regulations in the National Association of Regulatory Utility Commissioners (NARUC) outreach program with the Public Utilities Commission of Sri Lanka (PUCSL), supported by the Bureau of Energy Resources (ENR) at the United States Department of State. I am a member of the Institute of Electrical/Electronic Engineers (IEEE).

TESTIMONY AND REPORTS
BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

BY ALAN J. BAX

COMPANY	CASE NUMBER
Aquila Networks – MPS	ER-2004-0034
Union Electric Company d/b/a AmerenUE	EO-2004-0108
Empire District Electric Company	ER-2002-0424
Kansas City Power and Light Company	EA-2003-0135
Union Electric Company d/b/a AmerenUE	EO-2003-0271
Aquila Networks – MPS	EO-2004-0603
Union Electric Company d/b/a AmerenUE	EC-2002-0117
Three Rivers and Gascosage Electric Coops	EO-2005-0122
Union Electric Company d/b/a AmerenUE	EC-2002-1
Aquila Networks – MPS	EO-2001-0384
Empire District Electric Company	ER-2001-299
Aquila Networks – MPS	EA-2003-0370
Union Electric Company d/b/a AmerenUE	EW-2004-0583
Union Electric Company d/b/a AmerenUE	EO-2005-0369
Trigen Kansas City	HA-2006-0294
Union Electric Company d/b/a AmerenUE	EC-2005-0352
Missouri Public Service	ER-2001-672
Aquila Networks – MPS	EO-2003-0543
Kansas City Power and Light Company	ER-2006-0314
Macon Electric Coop	EO-2005-0076
Aquila Networks – MPS	EO-2006-0244
Union Electric Company d/b/a AmerenUE	EC-2004-0556
Union Electric Company d/b/a AmerenUE	EC-2004-0598
Empire District Electric Company	ER-2004-0570
Union Electric Company d/b/a AmerenUE	EC-2005-0110
Union Electric Company d/b/a AmerenUE	EC-2005-0177
Union Electric Company d/b/a AmerenUE	EC-2005-0313
Empire District Electric Company	EO-2005-0275
Aquila Networks – MPS	EO-2005-0270
Union Electric Company d/b/a AmerenUE	EO-2006-0145
Empire District Electric Company	ER-2006-0315
Aquila Networks – MPS	ER-2005-0436

COMPANY	CASE NUMBER
Union Electric Company d/b/a AmerenUE	EO-2006-0096
West Central Electric Cooperative	EO-2006-0339
Kansas City Power and Light Company	ER-2006-0314
Union Electric Company d/b/a AmerenUE	EO-2008-0031
Union Electric Company d/b/a AmerenUE	EC-2009-0193
Empire District Electric Company	ER-2008-0093
Missouri Rural Electric Cooperative	EO-2008-0332
Grundy Electric Cooperative	EO-2008-0414
Osage Valley Electric Cooperative	EO-2009-0315
Union Electric Company d/b/a AmerenUE	EO-2009-0400
Union Electric Company d/b/a AmerenUE	EO-2008-0310
Aquila Networks – MPS	EA-2008-0279
West Central Electric Cooperative	EO-2008-0339
Empire District Electric Company	EO-2009-0233
Union Electric Company d/b/a/ AmerenUE	EO-2009-0272
Empire District Electric Company	EO-2009-0181
Union Electric Company d/b/a AmerenUE	ER-2008-0318
Kansas City Power and Light Company	ER-2009-0089
Kansas City Power and Light – GMO	ER-2009-0090
Union Electric Company d/b/a AmerenUE	ER-2010-0036
Empire District Electric Company	ER-2010-0130
Laclede Electric Cooperative	EO-2010-0125
Union Electric Company d/b/a AmerenUE	EC-2010-0364
Union Electric Company d/b/a AmerenUE	EO-2011-0052
Kansas City Power and Light Company	ER-2010-0355
Union Electric Company d/b/a AmerenUE	EO-2010-0263
Kansas City Power and Light – GMO	EO-2011-0137
Kansas City Power and Light – GMO	ER-2010-0356
Union Electric Company d/b/a AmerenUE	ER-2011-0028
Kansas City Power and Light – GMO	EO-2012-0119
Kansas City Power and Light Company	EO-2011-0137
Union Electric Company d/b/a AmerenUE	ER-2012-0121
Union Electric Company d/b/a/ Ameren Missouri	EX-2012-0332
Empire District Electric Company	EO-2011-0085
Empire District Electric Company	EO-2012-0192
Empire District Electric Company	EO-2013-0313
Union Electric Company d/b/a AmerenUE	ER-2012-0180
Union Electric Company d/b/a AmerenUE	EO-2013-0418

COMPANY	CASE NUMBER
City Utilities of Springfield	EO-2012-0441
Kansas City Power and Light – GMO	EO-2012-0367
Empire District Electric Company	ER-2011-0004
Union Electric Company d/b/a/ Ameren Missouri	ER-2012-0166
Kansas City Power and Light Company	ER-2012-0174
Union Electric Company d/b/a/ Ameren Missouri	ER-2013-0044
Kansas City Power and Light – GMO	ER-2012-0175
Central Missouri Electric Cooperative	EO-2015-0137
Empire District Electric Company	ER-2012-0345
Kansas City Power and Light Company	EO-2012-0367
Boone Electric Cooperative	EO-2015-0012
Transource Missouri, LLC	EA-2013-0098
Black River Electric Cooperative	EO-2015-0096
Union Electric Company d/b/a/ Ameren Missouri	EW-2012-0369
Empire District Electric Company	ER-2014-0351
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0044
Union Electric Company d/b/a/ Ameren Missouri	EO-2013-0418
Union Electric Company d/b/a/ Ameren Missouri	EE-2013-0511
Union Electric Company d/b/a/ Ameren Missouri	EO-2015-0017
Union Electric Company d/b/a/ Ameren Missouri	EO-2016-0087
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0009
Kansas City Power and Light Company	EO-2014-0128
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0358
Empire District Electric Company	EO-2016-0192
Empire District Electric Company	EO-2017-0217
Union Electric Company d/b/a/ Ameren Missouri	EO-2014-0296
Union Electric Company d/b/a/ Ameren Missouri	EO-2015-0328
Union Electric Company d/b/a/ Ameren Missouri	ER-2014-0258
Union Electric Company d/b/a/ Ameren Missouri	EX-2017-0153
Union Electric Company d/b/a/ Ameren Missouri	EO-2019-0391
Empire District Electric Company	EO-2018-0118
Empire District Electric Company	ER-2016-0023
Ozark Electric Cooperative Inc.	EO-2020-0163
Union Electric Company d/b/a/ Ameren Missouri	EC-2016-0235
Union Electric Company d/b/a/ Ameren Missouri	EO-2018-0058
Union Electric Company d/b/a/ Ameren Missouri	EE-2019-0395
Kansas City Power and Light – GMO	ER-2016-0156
Kansas City Power and Light – GMO	EO-2019-0061

COMPANY	CASE NUMBER
Kansas City Power and Light Company	ER-2014-0370
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0044
Kansas City Power and Light Company	ER-2016-0285
Empire District Electric Company	EO-2019-0381
Union Electric Company d/b/a/ Ameren Missouri	ER-2016-0179
Union Electric Company d/b/a/ Ameren Missouri	EO-2018-0278
Union Electric Company d/b/a/ Ameren Missouri	EO-2020-0315
Union Electric Company d/b/a/ Ameren Missouri	EO-2017-0127
Kansas City Power and Light Company	ER-2018-0145
Kansas City Power and Light Company – GMO	ER-2018-0146
Evergy Missouri West LLC	EO-2021-0388
Gridliance High Plains, LLC	EM-2022-0156
Union Electric Company d/b/a/ Ameren Missouri	EO-2021-0305
Union Electric Company d/b/a/ Ameren Missouri	EM-2021-0309
Union Electric Company d/b/a/ Ameren Missouri	ER-2019-0335
Union Electric Company d/b/a/ Ameren Missouri	EE-2019-0383
Osage Valley Electric Cooperative, LLC	EO-2022-0073
Evergy Missouri West LLC	EO-2021-0339
Liberty Utilities-Empire	EO-2021-0389
Laclede Electric Cooperative	EO-2022-0143
Empire District Electric Company	ER-2019-0374
Union Electric Company d/b/a/ Ameren Missouri	ET-2021-0082
Union Electric Company d/b/a/ Ameren Missouri	ER-2021-0240
Liberty Utilities-Empire	ER-2021-0312
Liberty Utilities-Empire	EO-2022-0226
Union Electric Company d/b/a/ Ameren Missouri	EO-2021-0401
Union Electric Company d/b/a/ Ameren Missouri	EM-2022-0094
Union Electric Company d/b/a/ Ameren Missouri	EO-2022-0102
Liberty Utilities-Empire	EO-2022-0132

SCHEDULE AJB-d2

SUMMARY

RESULTS OF CALCULATIONS

SYSTEM ENERGY LINE LOSS FACTORS

Evergy Metro -	0.0609
Evergy West -	0.0669

DEMAND[1] ALLOCATION FACTORS

Evergy Metro

Missouri Retail	0.5215
Kansas Retail	0.4771
Wholesale	0.0014

Evergy West

Missouri Retail	0.9979
Wholesale	0.0021

ENERGY[2] ALLOCATION FACTORS

Evergy Metro

Missouri Retail	0.5646
Kansas Retail	0.4338
Wholesale	0.0016

[1] Jurisdictional Demand Allocation Factors, on both Evergy Metro and Evergy West electric systems, were determined utilizing the Four Coincident Peak Methodology ("4 CP"). In addition, the former municipal electric systems of the cities of Galt, Missouri and Rich Hill, Missouri were removed from the calculations made on Evergy West's system.

[2] The Energy Allocation Factors, for both Evergy Metro and Evergy West, were modified by applying customer growth, weather normalization, customer annualizations, and energy line loss adjustments. Also, the former municipal electric systems of Galt, Missouri and Rich Hill, Missouri were removed from the calculations made on Evergy West's system.

Evergy West

Missouri Retail	0.9981
Wholesale	0.0019

VOLTAGE ADJUSTMENT FACTORS

Evergy Metro

$VAF_{Transmission}$	1.0300
$VAF_{Primary}$	1.0493
$VAF_{Secondary}$	1.0686

Evergy West

$VAF_{Transmission}$	1.0300
$VAF_{Primary}$	1.0503
$VAF_{Secondary}$	1.0766

EVERGY_METRO - ER-2022-0129

Voltage Adjustment Factors

Station	Station Input	Metered Sales	Losses Total System	Station Output	% Losses Total System
Generation				8,600,000	
Transmission	8,600,000	340,959	250,485	8,008,556	3.0000%
Primary	8,008,556	866,339	147,119	6,995,098	1.8714%
Secondary	6,995,098	6,868,556	126,542	0	1.8423%

Station	Metered Sales	Station to Station Losses		
		Trans Sales	Pri Sales	Sec Sales
Generation				
Transmission	340,959	10,229	26,477	213,780
Primary	866,339		16,213	130,906
Secondary	6,868,556			126,542

Station	Cummalative Losses			FAC Expansion Factors
	Trans Sales	Pri Sales	Sec Sales	
Generation				
Transmission	10,229	42,689	471,228	**1.0300**
Primary		16,213	257,448	**1.0493**
Secondary			126,542	**1.0686**

EVERGY WEST - ER-2022-0130

Voltage Adjustment Factors

Station	Station Input	Metered Sales	Losses Total System	Station Output	% Losses Total System
Generation				8,583,034	
Transmission	8,583,034	241,668	249,991	8,091,375	3.0000%
Substation	8,091,375	311,633	68,559	7,711,183	0.8546%
Primary	7,711,183	612,042	84,124	7,015,017	1.1030%
Secondary	7,015,017	6,843,125	171,892	0	2.5119%

Station	Metered Sales	Station to Station Losses			
		Trans Sales	Sub Sales	Pri Sales	Sec Sales
Generation					
Transmission	241,668	7,250	9,429	18,722	214,590
Substation	311,633		2,663	5,288	60,608
Primary	612,042			6,751	77,373
Secondary	6,843,125				171,892

Station	Cummalative Losses				FAC Expansion Factors
	Trans Sales	Sub Sales	Pri Sales	Sec Sales	
Generation					
Transmission	7,250	12,092	30,761	524,463	**1.0300**
Substation		2,663	12,039	309,873	**1.0388**
Primary			6,751	249,265	**1.0503**
Secondary				171,892	**1.0766**