Exhibit No.:
Issue: Weather Normalization; Customer Annualization of Unit Sales
Witness: Albert R. Bass, Jr.
Type of Exhibit: Direct Testimony
Sponsoring Party: KCP&L Greater Missouri Operations Company
Case No.: ER-2018-0146
Date Testimony Prepared: January 30, 2018

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2018-0146

DIRECT TESTIMONY

OF

ALBERT R. BASS, JR.

ON BEHALF OF

KCP&L GREATER MISSOURI OPERATIONS COMPANY

Kansas City, Missouri
January 2018

DIRECT TESTIMONY

OF

ALBERT R. BASS, JR.

Case No. ER-2018-0146

Q: Please state your name and business address.

A: My name is Albert R. Bass, Jr. My business address is 1200 Main, Kansas City, Missouri 64105.

Q: By whom and in what capacity are you employed?

A: I am employed by Kansas City Power & Light Company ("KCP&L") as Manager of Energy Forecasting and Analytics.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of KCP&L Greater Missouri Operations Company ("GMO" or the "Company").

Q: What are your responsibilities?

A: My responsibilities include supervising two employees with responsibility for short-term electric load forecasting, long-term electric load forecasting, weather normalization, and various other analytical tasks.

Q: Please describe your education, experience and employment history.

A: I received a Bachelor of Science in Business Administration degree with emphasis in Marketing from Missouri Western State University in 1989. I earned a Master of Business Administration degree from William Woods University in 1995.

Prior to joining KCP&L, I worked for APS Technologies developing product forecast models and conducting market analysis. In June 1998, I joined KCP&L as a

Technical Professional. In this role, I conducted market analysis, developed market options studies, and research. In May 2000, I assumed the responsibilities for short-term budget forecasting, long-term load forecasting for the Integrated Resource Plan, monthly kilowatt-hour ("kWh") sales and peak weather normalization, and weather normalization for rate case filings. As part of these duties, I assisted with the creation of the weather normalization testimony filed by KCP&L. In July 2013, I was promoted to Manager of Market Assessment. In March 2017, I was promoted to my current position as Sr. Manager of Energy Forecasting and Analytics.

Q: Have you previously testified in a proceeding before the Missouri Public Service Commission ("Commission" or "MPSC") or before any other utility regulatory agency?

A: Yes, I provided written testimony in KCP&L Greater Missouri Operation Company's rate case (ER-2016-0156) and KCP&L's 2014 rate case (ER-2014-0370), KCP&L's 2016 rate case (ER-2016-0285) and KCP&L's rate case before the Kansas Corporation Commission (15-KCPE-116-RTS).

Q: What is the purpose of your testimony?

A: The purposes of my testimony is to sponsor Schedules ARB-1 through ARB-4, which include weather normalization, customer growth, rate switching, and energy efficiency adjustments of test year monthly kWh sales and peak loads. I recommend that the Commission adopt these results in the current case.

I. WEATHER NORMALIZATION, DECLINE IN AVERAGE USE

Q: What normalizations are you making to kWh sales and peak loads?

A: Both monthly and hourly kWh sales are adjusted to reflect normal weather conditions. This is called a weather adjustment. The kWh sales are further adjusted for customer growth that occurs between the test year and the true-up date of June 2018, and for customers who were switched from one rate to another during or after the test year. These customers are known as rate switchers. An additional adjustment to the kWh sales is made for energy efficiency that occurs between the test year and two months prior to the true-up date of June 2018.

Q: What is the purpose of making a weather adjustment?

A: Abnormal weather can increase or decrease a utility company's revenues, fuel costs and rate of return. Therefore, revenues and expenses are typically adjusted to reflect normal weather to determine a company's future electric rates. These adjustments are made by first adjusting kWh sales and hourly loads and then using these results to adjust test-year revenues and incremental costs (*i.e.*, fuel and purchased power).

During the test year, July 2016 through June 2017, there were 24% less heating degree days and 8.5% more cooling degree days than normal at the Kansas City International Airport. Thus, heating load was significantly lower than normal while cooling load was slightly above normal. This results in a net positive weather adjustment to kWh sales.

Q: What method was used to weather-normalize kWh sales?

A: The method was based on load research ("LR") data, which was derived by measuring hourly loads for a sample of GMO's customers representing the Residential, Small

General Service ("GS"), Large GS, and Large Power classes. The hourly loads were grossed up by the ratio of the number of customers for each of these classes divided by the number sampled.

In the first step, the hourly loads for the sample were calibrated to the annual billed sales of all customers in each class. The ratio of the billed sales divided by the sum of the hourly loads was multiplied by the load in each hour.

In the second step, the hourly loads were estimated for lighting tariffs and the loads for all tariffs, including sales for resale, were grossed up for losses and compared to Net System Input ("NSI"). The difference between this sum and the NSI then was allocated back to the LR data in proportion to the hourly precisions that were estimated for the load research data.

In the third step, regression analysis was used to model the hourly loads for each rate class. These models included a piecewise linear temperature response function of a two-day weighted mean temperature.

In the fourth step, this temperature response function was used to compute daily weather adjustments as the difference between loads predicted with normal weather and loads predicted with actual weather. Normal weather was derived using spreadsheets provided by the MPSC Staff. The normal weather represents average weather conditions over the 1981-2010 time period.

In the fifth step, the daily weather adjustments were split into hourly adjustments and these were added to NSI to weather-normalize that series.

In the sixth step, the daily weather adjustments were split into billing months based on the percentage of sales on each billing cycle and the meter reading schedule for

the test year period. These weather adjustments then are used to create a weather factor for each class for each month, which are multiplied by billed kWh sales to weather-normalize monthly class billed kWh sales. The Large Power ("LP") tariff weather factor is used to weather-normalize each individual customer within that class.

Q: What adjustment did you make for rate switchers?

A: Each year a small percentage of customers are switched from their current tariff to another that is expected to reduce their electric bills. We adjusted kWh sales for the Large Power tariff for customers that switched into or out of this tariff. There were seventy-six LP customers who switched rates during the test year. The customer growth adjustment accounted for rate switchers in the other tariffs.

Q: What adjustment did you make for customer growth?

A: For each month in the test year, the weather-normalized sales per customer were multiplied by the number of customers projected for the true-up date June 2018. This adjustment is made to weather-normalized sales to the Residential, Small GS, and Large GS classes. When the numbers become available, I will revise this adjustment using the actual number of customers as of the true-up date of June 2018.

Q: What adjustment did you make for LP?

Sales to LP customers are adjusted by plotting each customer's monthly kWh sales and looking for any changes in sales that appear to be or are known to be permanent resulting in an annualization by account on an individual customer basis. If any such changes are identified, sales during the test year are adjusted to reflect the change.

There were 253 customers in the LP class at the beginning of the test year. Eight customers ended service, seventy-six customers left the LP class, four customers

switched rates within the LP class, twelve customers switched to LP class and four new customers were added to the LP class. This results in 185 LP customers annualized for the test period. Customers that moved in or out of the LP class with partial data during the test year are annualized for the full test year. The adjustments for growth to LP sales will be revised using the most current data for the true-up.

Q: Were any other adjustments made besides the adjustment for rate switchers and customer growth?

A: Yes, an additional adjustment is made to annualize the impact of the Company's energy efficiency programs on test year sales. During the test year, GMO invested significantly on programs designed to help customers use energy more efficiently. The result of this investment in energy efficiency programs is a decline in the sales made by the Company relative to the level of sales that would be made absent the programs. Because the Company programs generated customer savings during the test year and true up period, the impact of those efficiency measures installed during the test year should be annualized to reflect the full impact of the measures on the Company's sales.

Q: Do installed efficiency measures in the test year affect the test year sales and why is it necessary to further adjust sales to fully reflect the impact of the programs?

A: Yes, if a residential customer who is not participating in any Company energy efficiency programs has an annual average usage of 10,500 kWh and then decided to participate in the Company programs with four months left in the test year, which now reduces their actual test year usage to 10,000 kWh the Company would only see a reduction of 500 kWh in the test year. In this example on an annual basis going forward, however, the customer's true annual average consumption is actually reduced by 1,500 kWh due to the

energy efficiency actions promoted by the Company. The reason is the change took place during the test year, but the impacts of the installed measures are only reflected in one-third of the test year load. The effect can be extreme when you start looking at all customer participation rates and the fact that they sign up and participate in various programs throughout the test year. Since the Company has documented participation rates and measures installed in the test year, the annualized energy savings of those measures, and the installation dates of the measures, it is appropriate to reflect the full energy impact of the measures in the test year. This is a known and measurable change in the energy consumption that occurred before the end of the test year, which will continue going forward and should be annualized.

Q: What are the adjustments to annualize the impact of Company's energy efficiency programs on test year's sales?

A: Upon filing a rate case, the cumulative, annualized, normalized kWh and kilowatt ("kW") savings will be included in the unit sales and sales revenues used in setting rates as of an appropriate time (most likely two months prior to the true-up date) where actual results are known prior to the true-up period, to reflect energy and demand savings in the billing determinants and sales revenues used in setting the revenue requirements and tariffed rates in the case.

Q: Describe how you calculated the energy efficiency adjustment.

A: The calculation of the energy efficiency adjustment is based on the stipulation in Case No. EO-2015-0241[1]:

[1] Non-Unanimous Stipulation and Agreement Resolving MEEIA Filings, Case No. EO-2015-0241, pp. 13-15.

In the first step, GMO will take test period weather normalized kWh usage for each customer class by billing month and adjust it by[2] adding back the monthly kWh energy savings by customer class incurred during the test period from all active Missouri Energy Efficiency Investment Act ("MEEIA") programs, excluding Home Energy Reports and Income-Eligible Home Energy Reports programs which have a one year measure life, determined using the same methodology as described in Tariff Sheet 138.4 and 138.5 (GMO) except that calendar month load shape percentages by program by month will be converted to reflect billing month load shape percentages by program by computing a weighted average of the current and succeeding month percentages.

In the second step, the adjusted test period sales from above will be annualized for customers and additionally be adjusted further by subtracting the cumulative annual kWh energy savings from the first month of the test period through the month ending where actual results are available (most likely two months prior to the true-up date) by customer class from all active MEEIA programs, excluding Home Energy Reports and Income-Eligible Home Energy Reports, determined using the same methodology as described in Tariff Sheet 138.4 and 138.5 (GMO) except that calendar month load shape percentages by program by month are converted to reflect billing month load shape percentages by program by computing a weighted average of the current and succeeding month percentages.

---

[2] Step 1. Begin with Weather Normalized kWh per class provided by Company. Step 2. Compute Monthly Savings kWh (MS) per program in the same manner as used for TD calculation. Step 3. Weather Normalized kWh before application of Energy Efficiency (EE) adjustment. Step 4. Cumulative Annual Savings kWh (CAS) per program computed in the same manner as TD calculation as of Rebase Date. Step 5. Monthly Load Shape percentage per program converted to billing month equivalent by using a weighted average calendar month Load Shape percentage based on billing cycle information of the rate case. Step 6. Monthly EE Rebase Adjustment. Step 7. Weather Normalized kWh rebased for EE.
Non-Unanimous Stipulation and Agreement Resolving MEEIA Filings, Case No. EO-2015-0240, -0241, p. 13.

In the third step, the test period kW demand for each customer class will be adjusted by[3] adding back the monthly kW demand savings by customer class incurred during the test period from all active MEEIA programs, excluding Home Energy Reports, Income-Eligible Home Energy Reports and Demand Response Incentive programs, determined using the same methodology as described for kWh savings in Tariff Sheet 138.4 and 138.5 (GMO) and then subtracting the cumulative annual kW demand savings from the first month of the test period through the month ending where actual results are available (most likely two months prior to the true-up date) by customer class from all active MEEIA programs, excluding Home Energy Reports, Income-Eligible Home Energy Reports and Demand Response Incentive programs, determined using the same methodology as described for kWh savings in Tariff Sheet 138.4 and 138.5 (GMO).

In the fourth step, after the energy efficiency adjustment for kWh and kW has been determined, weather normalized kWh and kW are rebased with the energy efficiency adjustment. kWh sales are rebased by subtracting the energy efficiency adjustment from the weather normalized kWh and kW (demand) is determined by taking the monthly kWh and spreading it across an hourly load shape to determine the monthly peak demand.

The impacts that are applied to the weather normalized and customer adjusted kWhs used to rebase the weather normalized sales are shown in Schedule ARB-2.

---

[3] Step 1. Begin with kW demand per class provided by Company. Step 2. Compute Monthly kW demand per program in the same manner as used for TD calculation. Step 3. kW demand before application of Energy Efficiency (EE) adjustment. Step 4. Cumulative Annual kW demand per program computed in the same manner as TD calculation as of Rebase Date. Step 5. Monthly Load Shape percentage per program converted to billing month equivalent by using a weighted average calendar month Load Shape percentage based on billing cycle information of the rate case. Step 6. Monthly EE Rebase Adjustment. Step 7. kW demand rebased for EE.
Non-Unanimous Stipulation and Agreement Resolving MEEIA Filings, Case No. EO-2015-0240, -0241, p. 13.

Q: What are the results of these normalizations?

A: Schedule ARB-1 shows the monthly adjustments for normalization on kWh sales. Schedule ARB-2 shows the annualized kWh energy efficiency impact. Schedule ARB-3 shows weather-normalized customer annualized monthly peaks by class. Schedule ARB-4 shows weather-normalized customer annualized loads by class at the time of the monthly system peak load.

Q: How are these results used?

A: Weather-normalized, customer-annualized kWh sales are used to calculate test year revenues and fuel costs.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority to Implement A General Rate Increase for Electric Service	))))	Case No. ER-2018-0146

AFFIDAVIT OF ALBERT R. BASS, JR.

STATE OF MISSOURI)
) **ss**
COUNTY OF JACKSON)

Albert R. Bass, Jr., being first duly sworn on his oath, states:

1. My name is Albert R. Bass, Jr. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Sr. Manager-Energy and Forecasting.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of KCP&L Greater Missouri Operations Company consisting of ten (10) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Albert R. Bass, Jr.

Subscribed and sworn before me this 29th day of January, 2018.

Notary Public

My commission expires: 4/26/2021

ANTHONY R WESTENKIRCHNER
Notary Public, Notary Seal
State of Missouri
Platte County
Commission # 17279952
My Commission Expires April 26, 2021

WEATHER ADJUSTMENTS TO MONTHLY BILLED SALES OF GMO

NORMALIZATIONS TO MONTHLY MWH SALES

		Weather Adjustments to Monthly Billed Sales												
	Tariff	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Test Year
GMO	Residential	35,007	-3,656	8,484	11,450	-9,304	-14,644	-4,952	-24,678	-25,654	-10,259	-1,738	3,976	-35,968
	Small GS	5,519	-279	2,674	2,836	-1,159	-3,076	-1,724	-6,815	-5,377	-2,087	-608	1,027	-9,070
	Large GS	6,507	-381	3,267	3,148	-1,945	-3,529	-1,920	-7,728	-6,788	-2,553	-530	1,232	-11,221
	Large Power	3,106	-659	2,226	2,316	978	-437	-1,433	-3,279	-1,152	145	-29	742	2,524
	Total	50,138	-4,975	16,651	19,749	-11,430	-21,686	-10,029	-42,500	-38,971	-14,754	-2,906	6,977	-53,735

ANNUALIZED ENERGY EFFICIENCY IMPACTS FOR GMO

ENERGY EFFICIENCY ADJUSTMENT TO MONTHLY MWH SALES

		Energy Efficiency Adjustments to Monthly Billed Sales												
State	Tariff	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Test Year
GMC	Residential	-6,039	-6,234	-5,083	-3,917	-3,353	-3,376	-3,485	-3,119	-2,755	-2,568	-2,613	-2,844	-45,385
GMC	Small GS	-3,698	-3,774	-3,585	-3,416	-3,328	-3,160	-3,112	-2,874	-2,532	-2,087	-1,832	-1,830	-35,227
GMC	Large GS	-4,576	-4,674	-4,467	-4,287	-4,175	-3,977	-4,022	-3,822	-3,462	-2,867	-2,403	-2,346	-45,079
GMO	Large Power	-3,003	-3,071	-2,976	-2,936	-2,903	-2,791	-2,860	-2,747	-2,659	-2,510	-2,347	-2,341	-33,142
	Total	-17,315	-17,753	-16,110	-14,555	-13,759	-13,304	-13,480	-12,561	-11,408	-10,031	-9,195	-9,361	-158,833

WEATHER NORMALIZED MONTHLY PEAK LOADS (MW) for GMO

		WEATHER NORMALIZED MONTHLY PEAK LOADS WITH CUSTOMER GROWTH THROUGH July 2016 (MW)												
	Tariff	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Test Year
GMO	Residential	945	991	701	447	558	750	750	671	687	534	698	878	991
	Small GS	282	279	242	199	177	245	250	227	148	160	183	214	282
	Large GS	150	145	133	100	99	128	146	124	102	175	205	217	217
	Large Power	325	330	317	293	271	268	276	280	263	289	306	330	330
	Lighting	16	16	16	16	16	16	17	17	17	17	17	17	17

Note: These numbers include losses.

WEATHER NORMALIZED MONTHLY COINCIDENT PEAK LOADS (MW) for GMO

WEATHER NORMALIZED MONTHLY COINCIDENT PEAK LOADS WITH CUSTOMER GROWTH THROUGH July 2016 (MW)

	Tariff	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Test Year
GMO	Residential	945	991	690	408	551	750	750	671	687	518	680	878	991
	Small GS	261	235	239	191	159	182	181	174	136	141	158	186	261
	Large GS	126	114	125	97	89	104	88	110	102	158	187	202	126
	Large Power	312	322	300	287	258	262	258	273	250	283	294	325	322
	Lighting	0	0	1	0	16	0	17	0	0	0	0	0	17
	Total Retail	1,643	1,663	1,355	984	1,073	1,298	1,295	1,228	1,175	1,099	1,321	1,591	1,663
	Sales for Resale	6	6	5	3	4	5	5	5	4	3	4	5	6
	Total System	1,650	1,669	1,360	987	1,077	1,303	1,299	1,233	1,179	1,103	1,324	1,596	1,669

Note: These numbers include losses.