DATA REQUEST

KPSC 8_1 Refer to Section II of the Application, Exhibit D, page 135 of 185, Tariff N.M.S. II, Application, Inspection and Processing Fees.
a. Explain how Kentucky Power would decide whether an impact study is necessary with respect to a Level 2 Application.
b. Provide the total cost of each impact study performed from 2016 to present.

RESPONSE

a. Distribution Planning Engineers reviewing an application on technical merits may recommend additional study for any application if the extent and severity of impacts on the Area Electric Power System cannot be readily determined and additional time and labor would be required to model the generator on the local distribution circuit.

b. Please refer to KPCO_R_KPSC_8_1_Attachment1 for the requested information

KPSC Case No. 2020-00174 Commission Staff's Eight Set of Data Requests Dated February 12, 2021 Item No. 1 Attachment 1 Page 1 of 1

Customer Invoiced Costs of Distribution Impact Studies performed between 2016 to Present

Project	Invoice Amount
1	\$1,000.00
2	\$20,557.14
3	\$12,053.14
4	\$12,840.02
5	\$12,840.02
6	\$19,165.27
7	\$15,221.38
8	\$15,221.38
9	\$15,221.38
10	\$15,221.38

DATA REQUEST

KPSC 8_2 Refer to the Direct Testimony of Alex E. Vaughan (Vaughan Direct Testimony), page 22, lines 16–17, which states, "This is appropriate because a growing amount of the Company's cost of service is comprised of fixed costs related to infrastructure investments."

a. Provide all analyses Kentucky Power conducted to substantiate this claim.

b. Provide a definition of "fixed costs" as used in the above sentence, including, but not limited to, the Federal Energy Regulatory Commission (FERC) accounts, or classified costs in Kentucky Power's cost study, considered as fixed costs.

RESPONSE

a. The statement is premised upon a comparison of the growth in infrastructure investments by Kentucky Power since September 30, 2014. Please refer to Section V schedule 4 filed in this case, the Company's 2017 base case (2017-00179) and the 2014 base case (2014-00396) before that. Please also see the direct testimony of Company Witness Vaughan and the discussion concerning rising transmission infrastructure costs over the same time period.

b. "Fixed costs" for purposes of this discussion are costs that do not change (increase, decrease or go away) when volumetric (kWh) energy usage changes, including but not limited to, costs associated with connecting a customer to the radial distribution system and with sizing the distribution system to meet customer peak kW demand.

DATA REQUEST

KPSC 8_3 Refer to Vaughan Direct Testimony, page 22, line 17, to page 23, line 2.

a. Provide all analysis and documents that Kentucky Power relied on as support for this section of testimony.

b. Explain how the changes in the PJM market directly influenced the on to off peak changes Kentucky Power is proposing. Provide all workpapers associated with your analysis, including all calculations in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

a. Besides the Company's experience in the energy markets of PJM, please also refer to KPCO_R_KPSC_8_3_Attachment1 for 10 years of historic PJM LMPs at which the Company's load settles. The attachment shows around the clock average, on-peak and off-peak day ahead LMPs.

b. The on/off peak differential in the Company's TOU rates was not supported by cost of service and as such the Company proposed to increase the amount of fixed cost contribution recovered in the off-peak TOU rates. Based on the Company's understanding of the Commission's January 13, 2021 Order, the Company's proposed rate design was accepted in the rates set forth in Appendix C to the Order. As can be seen in KPCO_R_KPSC_8_3_Attachment1, historic on-peak LMPs (marginal cost of energy) are lower than the Company's off-peak TOU rates, hence the proposed and approved TOU rate design refinement.

DATA REQUEST

KPSC 8_4 Refer to Vaughan Direct Testimony, page 24, lines 16–18. Explain and provide the analysis that Kentucky Power relied upon for determining the two netting time periods (i.e., 8 AM to 6 PM and 6 PM to 8 AM).

RESPONSE

Please refer to the direct testimony (pages 26-27) and Exhibit AEV-3 of Company Witness Vaughan that support the Company's NMS II proposal. Please also refer to the Company's response to Joint Intervenors 1-5.

These are attached as KPCO_R_KPSC_8_4_Attachment1 and KPCO_R_KPSC_8_4_Attachment2 respectively.

VAUGHAN-24

1 **Q**. BEFORE YOU DISCUSS THE PROPOSED CHANGES TO THE NMS TARIFF, 2 CAN YOU CLARIFY WHETHER OR NOT THE CHANGES WILL APPLY TO CURRENT CUSTOMERS TAKING SERVICE UNDER THE COMPANY'S NMS 3 4 **TARIFF?**

5 A. The Company's proposed changes to the NMS tariff will only apply to customers whose 6 eligible electric generating facility begins service after January 1, 2021. Existing NMS 7 customers will continue their current service under the existing NMS I tariff. This proposal comports with the requirements of KRS 278 466 and is a reasonable outcome because 8 9 current NMS customers made their investment decisions based on the old 1 to 1 net 10 metering policy and the underlying economics. They thus will be grandfathered under the 11 previous compensation regime for up to 25 years. This filing however should serve as 12 notice to customers that the NMS tariff is changing and that a new compensation system 13 will be in place for customers who choose to net meter in the future.

14 Q. PLEASE DESCRIBE THE COMPANY'S CHANGE TO THE NETTING PERIODS 15

UNDER ITS PROPOSED TARIFF NMS II.

16 A. The Company is proposing two time of use ("TOU") netting periods, 8 AM to 6 PM and 6 17 PM to 8 AM, for each day of the year. All net kWh (and kW where applicable) usage 18 (negative or positive) will be accumulated for each netting period for the billing period. If 19 a customer's eligible generator produces more kWh than are consumed by the customer's 20 load in a netting period for the billing period then the customer's eligible generator has 21 produced excess generation which is referred to as "net negative energy" ("NNE") in 22 proposed tariff NMS II. If a customer's load requirements (kWh usage) is greater than the

VAUGHAN-25

1		kWh produced by its eligible generator during a netting period for the billing period then
2		the customer has net positive billing energy and demand (where applicable).
3	Q.	WHAT NET AMOUNTS OF BILLABLE ENERGY AND NNE DOES THE
4		COMPANY EXPECT USING THE PROPOSED NETTING PERIODS FOR A
5		TYPICAL RESIDENTIAL CUSTOMER THAT IS NET METERING?
6	A.	The Company would expect a typical residential customer having a typical solar net
7		metering installation to have approximately 639 kWh of billing energy and produce 783
8		kWh of excess generation in a billing period. I have calculated these amounts based on the
9		test year average residential usage of 1,240kWh per month, the average load shape of the
10		residential class, the average solar net metering installation size in the Company's service
11		territory, and the solar generation shape that can be expected in eastern Kentucky.
12	Q.	HOW ARE THE OTHER KWH OF USAGE TREATED?
13	A.	In the above average customer example, the NMS II tariff billing for the month results in
14		only 639 kWh of billing energy when we know that an average customer uses 1,240 kWh
15		each month on average. The other 601 kWh of customer usage was netted by the
16		customer's self-generation and is not being billed by the Company and thus receiving a

17 credit equal to the full retail rate.

KPSC Case No. 2020-00174 Commission Staff's Eight Set of Data Requests Dated February 12, 2021 Item No. 4 Attachment 1 Page 3 of 3 Exhibit AEV-3 Page 1 of 2

<u>Avg Monthly kWh</u> 639 783 601

> Net Billing kWh Net Excess Gen Netted kWh

Excess % Hours wt
68% 5%
52% 70%

Exhibit AEV-3 Example of Typical Customer and Typical Solar Install

KPSC Case No. 2020-00174 Commission Staff's Eight Set of Data Requests Dated February 12, 2021 Item No. 4 Attachment 2 Page 1 of 1

Kentucky Power Company KPSC Case No. 2020-00174 Joint Intervenors First Set of Data Requests Dated August 12, 2020

DATA REQUEST

JI_1_005 Explain how the N.M.S. II time blocks hours were selected?

RESPONSE

The netting periods were selected to register the majority of eligible solar generation in a single netting period. They thus only provide a one-to-one netting for load that is more closely matched up with actual eligible solar generation.

DATA REQUEST

KPSC 8_5 Refer to Vaughan Direct Testimony, page 27, lines 10–11. Describe how marginal losses, congestion, and distribution losses (primary and secondary) are calculated and included in the avoided cost rate, and identify the individual dollar value of each of those components. Provide workpapers supporting the calculations in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

PJM marginal losses and transmission congestion are components of the total PJM LMP which is the Company's marginal cost of energy used in the NMS II avoided cost rate and in the Company's approved Cogen SPP tariff. The calculation of the avoided distribution losses and their inclusion in the NMS II avoided cost rates can be found in KPCO_R_KPSC_3_1_Attachment15 and KPCO_R_KPSC_3_1_Attachment17.

The forward energy prices used in the proposed NMS II rates are total LMP, meaning that they include the energy, marginal loss and congestion components of LMP. These components are not specifically broken out. Please also refer to the Company's response to KPSC 4-102 and KPSC 5-24.

DATA REQUEST

KPSC 8_6 Refer to KPCO_R_KPSC_3_1_Attachment17_VaughanWP3. Identify all components of the "On Pk" and "Off Pk" \$/kWh values in the Cogen SPP Energy values in rows 15 and 16 on tab "Excess Gen Price", and provide the calculations in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

The forward looking PJM LMP includes energy, transmission congestion, and marginal transmission losses, as well as a gross up for avoided primary distribution losses. The requested information does not exist because components of forward looking LMP are not broken out. Please also refer to the Company's response to Staff 8-5 for background on the calculations and where they can be found in other discovery responses.

Please also note that the Commission's January 13, 2021 Order did not approve the forward PJM energy prices as the Company's avoided cost of energy; instead, it approved PJM LMP at the time of delivery for use in the Company's Cogen SPP tariff offering.

DATA REQUEST

KPSC 8_7 Provide 8760-hour system and residential load profiles for each of last five years in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

The requested information does not exist because the Company does not compute residential annual class load profiles in the normal course outside of rate case test years and because the Company does not have interval metering on its residential class. Please see KPCO_R_KPSC_8_7_Attachment1 for the residential load profile from the test year in the Company's 2017 base rate case filing. Please refer to KPCO_R_KPSC_3_1_Attachment17 for the residential load profile for the test year in this case. Those are the only two residential 8760 load profiles available for the last 5 years.

KPCO_R_KPSC_8_7_Attachment2 provides hourly internal load for 2016 through 2020.

Witness: Alex E. Vaughan

Witness: Randy E. Holliday

DATA REQUEST

KPSC 8_8 Refer to Kentucky Power's Post-Hearing Brief, page 100. Explain whether the described "cost of service analysis" conducted by Kentucky Power refers to the avoided cost calculations in AEV-3. Describe and produce any other cost of service analyses, aside from AEV-3, that have informed the appropriateness of the proposed compensation rate.

RESPONSE

The referenced "cost of service analysis" included the calculations set forth in Exhibit AEV-3 to Company Witness Vaughan's Direct Testimony and those contained in Exhibits AEV R-4 through AEV-R7 of Mr. Vaughan's Rebuttal Testimony.

Please also refer to the supplemental testimonies and exhibits of Company Witnesses Vaughan and Stegall to be filed on or before February 25, 2021.

DATA REQUEST

KPSC 8_9 Refer to the Rebuttal Testimony of Alex E. Vaughan (Vaughan Rebuttal Testimony), Exhibit AEV-R4. Provide all supporting work papers in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible. Also, provide links or copies of all references used to support the workpapers.

RESPONSE

Please refer to KPCO_R_KPSC_8_9_Attachment1 for the requested information.

DATA REQUEST

KPSC 8_10 Refer to Vaughan Rebuttal Testimony, page 28, which states, "the energy value is then grossed up for avoided primary distribution level losses."

a. Provide the percentage of residential customers who take service at the primary distribution service level.

b. Explain why it is appropriate to not gross up losses at the secondary level for those taking service at the secondary level.

RESPONSE

a. 0% of Kentucky Power's residential customers take service at the primary distribution service level.

b. There are no secondary loss savings when a customer generator back feeds excess generation. Total secondary system losses will remain the same regardless of whether they are being served by customer excess generation or grid power. Therefore a gross up for avoided secondary losses is not appropriate.

DATA REQUEST

KPSC 8_11 Refer to Vaughan Rebuttal Testimony, page 28. For the most recent ten years available, provide Kentucky Power's highest 876 hours of load at the distribution level for each year. Provide your answer in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

KPCO_R_KPSC_8_11_Attachment1 provides internal load for the 876 highest hours for 2011-2020.

Witness: Randy E. Holliday

DATA REQUEST

KPSC 8_12 Refer to Vaughan Rebuttal Testimony, page 28. For the most recent three years available, provide Kentucky Power's highest 876 hours of load at each distribution substation for each year. Provide your answer in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

DATA REQUEST

KPSC 8_13 Refer to Vaughan Rebuttal Testimony, page 28. Define "highest distribution loading (peak loads [sic]) events ... (and) ... the Company designs its distribution system to service the highest peak load."
a. Explain whether peak loads vary by circuit or substation, or both, and provide documents that substantiate your response.
b. Explain Kentucky Power's approach to sizing substations, including, but not limited to, the load forecasts that are utilized for sizing substations and whether a distribution system peak or a more local forecast is used to size substations.

RESPONSE

DATA REQUEST

KPSC 8_14 Refer to Vaughan Rebuttal Testimony in general. Provide Kentucky Power's distribution system planning guidelines and manuals used for planning, sizing, and replacing distribution system equipment.

RESPONSE

DATA REQUEST

KPSC 8_15 Refer to Vaughan Rebuttal Testimony in general. Provide Kentucky Power's distribution system planning criteria used for determining whether equipment requires replacement for thermal violations.

RESPONSE

DATA REQUEST

KPSC 8_16 Refer to Vaughan Rebuttal Testimony, page 29, lines 12–20. Also, refer to Vaughan Direct Testimony, page 26, line 20, to page 27, line 6. Explain how load reductions from solar are accounted for by PJM, and provide all references relied upon for your answer.

RESPONSE

For a non-market facing resource in PJM, such as a residential or commercial solar net metering system, the system's output reduces the Company's hourly load settled in PJM's energy markets. The output is not specifically accounted for in any way other than that it reduces the Company's hourly load that is settled at the Kentucky Power residual load aggregate in PJM. For more information on how PJM settles its energy market, please refer to PJM's manuals which are publicly available at www.pjm.com.

DATA REQUEST

KPSC 8_17 Refer to KPCO_R_KYSEIA_1_3_Attachment1. Explain the source of the solar project data used in the "Peak Reduction" tab. Include in your answer, but do not limit it to, the number of facilities and years the data represents. Provide all workpapers relied upon to support both the initial and current discovery request, including calculations in Excel spreadsheet format with formulas intact and unprotected, and all rows and columns fully accessible.

RESPONSE

Please refer to the Company's response to KPSC 4-82 and Joint Intervenors 2-14.

Additionally, the Company chose to use a utility scale solar project shape in the avoided cost analysis due to the higher capacity factor it would achieve as a conservative assumption in the calculation of the avoided cost rate.

DATA REQUEST

KPSC 8_18 Refer to the Rebuttal Testimony of Brian K. West, page 15. Provide the screening criteria Kentucky Power uses to evaluate interconnecting facilities, and include a detailed explanation of how each screening criteria is tested and the associated assumptions.

RESPONSE





Vaughan DR.docx

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E-Signature 1: Alex E. Vaughan (AEV)

February 22, 2021 04:37:32 -8:00 [14B654CFA87C] [167.239.221.83] aevaughan@aep.com (Principal) (Personally Known)

E-Signature Notary: S. Smithhisler (SRS)

February 22, 2021 04:37:32 -8:00 [75423C57DACE] [167.239.221.83] srsmithhisler@aep.com

I, S. Smithhisler, did witness the participants named above electronically sign this document.



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VERIFICATION

The undersigned, Alex E. Vaughan, being duly sworn, deposes and says he is a Director-Regulatory Pricing & Renewables for American Electric Power Service Corporation that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

	Alex E. Vaughan Signed on 2021/02/22 04:37:22-8:00
	Alex E. Vaughan
STATE OF OHIO)) Casa Na. 2020 00174
COUNTY OF FRANKLIN) Case No. 2020-00174)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Alex

E. Vaughan this^{22nd} y of February 2021.



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Signed on 2021/02/22 04	:37:32 -8:00

Notary Public

Notary ID Number: ___2019-RE-775042_____

My Commission Expires: ___April 29, 2024____





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E-Signature Summary

E-Signature 1: Randy E. Holliday (REH)

February 18, 2021 05:10:54 -8:00 [54AE9C101CC5] [167.239.2.87] reholliday@aep.com (Principal) (Personally Known)

E-Signature Notary: S. Smithhisler (SRS)

February 18, 2021 05:10:54 -8:00 [CCF5885171AA] [167.239.221.83] srsmithhisler@aep.com

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VERIFICATION

The undersigned, Randy E. Holliday, being duly sworn, deposes and says he is Economic Forecast Analyst for American Electric Power Service Corporation that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

	Randy E. Holliday Signed on 200 100/18 05 10:54 - 8:00
	Randy E. Holliday
	,
STATE OF OHIO)) Case No. 2020-00174
COUNTY OF FRANKLIN)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by

Randy E. Holliday, this^{18th} Jay of February 2021.



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Notary Public

Notary ID Number: ____2019-RE-775042_____

My Commission Expires: __April 29, 2024___





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E-Signature Summary

E-Signature 1: Everett Phillips (G)

February 19, 2021 07:12:49 -8:00 [4E1FF737C837] [167.239.2.87] egphillips@aep.com (Principal) (Personally Known)

E-Signature Notary: S. Smithhisler (SRS)

February 19, 2021 07:12:49 -8:00 [DFBC92D9A209] [167.239.221.83] srsmithhisler@aep.com

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VERIFICATION

The undersigned, Everett G. Phillips, being duly sworn, deposes and says he is Vice President of Distribution Region Operations for Kentucky Power Company that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

	Everett Phillips Symet an 2021 102/19 27 12 49 - 600
	Everett G. Phillips
STATE OF OHIO)
COUNTY OF FRANKLIN)Case No. 2020-00174)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Everett G. Phillips, this _____ day of February 2021.



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Signed on 2021/02/19 07:12:49 -8:00	_

Notary Public

Notary ID Number: ___2019-RE-775042_____

My Commission Expires: __April 29, 2024___

VERIFICATION

The undersigned, Brian K. West, being duly sworn, deposes and says he is Vice President, Regulatory & Finance for Kentucky Power Company that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

Brian K. West

State of Indiana)) ss Case No. 2020-00174 County of Allen)

Subscribed and sworn to before me, a Notary Public, in and for said County and State, Brian K. West this 17th day of February, 2021.

Regiana M. Sistevaris

Digitally signed by Regiana M. Sistevaris Date: 2021.02.17 13:03:35 -05'00'

Regiana M. Sistevaris, Notary Public

My Commission Expires: January 7, 2023