

**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

**IN THE MATTER OF ELECTRONIC 2019** :  
**INTEGRATED RESOURCE PLANNING REPORT OF** : **Case No 2019-00443**  
**KENTUCKY POWER COMPANY** :

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**FIRST SET OF DATA REQUESTS OF**  
**KENTUCKY INDUSTRIAL UTILITY CUSTOMERS, INC.**  
**TO KENTUCKY POWER COMPANY**

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**COUNSEL FOR KENTUCKY INDUSTRIAL  
UTILITY CUSTOMERS, INC.**

**Dated: April 30, 2020**

## DEFINITIONS

1. "Document" means the original and all copies (regardless of origin and whether or not including additional writing thereon or attached thereto) of memoranda, reports, books, manuals, instructions, directives, records, forms, notes, letters, notices, confirmations, telegrams, pamphlets, notations of any sort concerning conversations, telephone calls, meetings or other communications, bulletins, transcripts, diaries, analyses, summaries, correspondence investigations, questionnaires, surveys, worksheets, and all drafts, preliminary versions, alterations, modifications, revisions, changes, amendments and written comments concerning the foregoing, in whatever form, stored or contained in or on whatever medium, including computerized memory or magnetic media.
2. "Study" means any written, recorded, transcribed, taped, filmed, or graphic matter, however produced or reproduced, either formally or informally, a particular issue or situation, in whatever detail, whether or not the consideration of the issue or situation is in a preliminary stage, and whether or not the consideration was discontinued prior to completion.
3. "Person" means any natural person, corporation, professional corporation, partnership, association, joint venture, proprietorship, firm, or the other business enterprise or legal entity.
4. A request to identify a natural person means to state his or her full name and residence address, his or her present last known position and business affiliation at the time in question.
5. A request to identify a document means to state the date or dates, author or originator, subject matter, all addressees and recipients, type of document (e.g., letter, memorandum, telegram, chart, etc.), number of code number thereof or other means of identifying it, and its present location and custodian. If any such document was, but is no longer in the Company's possession or subject to its control, state what disposition was made of it.
6. A request to identify a person other than a natural person means to state its full name, the address of its principal office, and the type of entity.
7. "And" and "or" should be considered to be both conjunctive and disjunctive, unless specifically stated otherwise.
8. "Each" and "any" should be considered to be both singular and plural, unless specifically stated otherwise.
9. Words in the past tense should be considered to include the present, and words in the present tense include the past, unless specifically stated otherwise.
10. "You" or "your" means the person whose filed testimony is the subject of these interrogatories and, to the extent relevant and necessary to provide full and complete answers to any request, "you" or "your" may be deemed to include any person with information relevant to any interrogatory who is or was employed by or otherwise associated with the witness or who assisted, in any way, in the preparation of the witness' testimony.
11. "AEP" means American Electric Power and/or any of their officers, directors, employees, or agents who may have knowledge of the particular matter addressed.
12. "Company" means Kentucky Power Co. d/b/a American Electric Power, and/or any of their officers, directors, employees or agents who may have knowledge of the particular matter addressed.

## INSTRUCTIONS

1. If any matter is evidenced by, referenced to, reflected by, represented by, or recorded in any document, please identify and produce for discovery and inspection each such document.
2. These interrogatories are continuing in nature, and information which the responding party later becomes aware of, or has access to, and which is responsive to any request is to be made available to Kentucky Industrial Utility Customers. Any studies, documents, or other subject matter not yet completed that will be relied upon during the course of this case should be so identified and provided as soon as they are completed. The Respondent is obliged to change, supplement and correct all answers to interrogatories to conform to available information, including such information as it first becomes available to the Respondent after the answers hereto are served.
3. Unless otherwise expressly provided, each interrogatory should be construed independently and not with reference to any other interrogatory herein for purpose of limitation.
4. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
5. Please answer each designated part of each information request separately. If you do not have complete information with respect to any interrogatory, so state and give as much information as you do have with respect to the matter inquired about, and identify each person whom you believe may have additional information with respect thereto.
6. In the case of multiple witnesses, each interrogatory should be considered to apply to each witness who will testify to the information requested. Where copies of testimony, transcripts or depositions are requested, each witness should respond individually to the information request.
7. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.
8. Responses to requests for revenue, expense and rate base data should provide data on the basis of Total Company as well as Intrastate data, unless otherwise requested.

**KIUC's FIRST SET OF DATA REQUESTS  
TO KENTUCKY POWER COMPANY  
CASE NO. 2019-00443**

- Q.1-1 For each of the 6 resource plans, provide a load and resource table showing peak demand, existing resources by individual resource, new resources, any retirements, capacity reserves, and the Company's reserve margin calculation. Provide this information to 2049, the end of the Plexos modeling period, and provide this electronically, with all formulae intact.
- Q.1-2 For every table or graph presented in the Executive Summary please provide all workpapers used to create the tables and graphs and provide them electronically with all formulae intact.
- Q.1-3 Page ES-3 mentions that runs went to 2049 so that end effects were considered. Please explain in detail how end effects were computed for both production costs, and capital revenue requirements, and provide an example of the end effects calculation for each of these types of costs..
- Q.1-4 Page ES-3 states that Kentucky Power utilized Plexos to develop least cost portfolios. Please provide a Plexos Input Summary Report and provide the Plexos derived output reports for each of the 6 optimal resource plans cases. Provide this electronically, with all formulas intact.
- Q.1-5 Concerning the MISO modeling in Plexos.
- a. Please describe in detail how the MISO modeling was performed in Plexos. Were all of the MISO loads and resources modeled or was MISO represented using transmission links and market profiles?
  - b. If MISO was represented using transmission links and market profiles, Provide all workpapers, electronically, with all formulae intact that were developed to create the MISO modeling inputs, including among other things, the derivation of the transmission capacity limits and the market price, as well as any other data modeled to represent MISO in Plexos.
- Q.1-6 Page ES-4 states "*...although the evaluation of the optimization scenarios occurred over a 30-year study period, the revenue requirements throughout the 15-year planning period influenced the identification of the Preferred Plan.*"
- a. Please provide a narrative explaining what the Company meant by the fact that revenue requirements over just 15-years influenced the identification of the Preferred Plan. Did the Company ignore costs beyond 15 years?
  - b. Provide all spreadsheets in which the final revenue requirements and net present values results that were derived for each of the 6 resource plans in which just 15 years were used.
- Q.1-7 See pg. ES-4 of the Company's filed IRP, which states, "*Kentucky Power's Preferred Plan considered a resource mix that included attributes of the various Optimal Plans.*" Provide the step by step process that the Company followed in reaching a decision going from the 6 optimal Plexos-derived resource plans to its resulting Preferred Plan. Provide all modeling analyses,

memos, workpapers, electronically with all formulas attached that were used in this decision-making process.

- Q.1-8 When solar resources were evaluated in Plexos, did the Company include any additional operating reserve requirements or add in integration costs? If not, why not, and if so, please provide all workpapers used to derive the assumptions modeled. Also, provide an explanation of the assumptions the Company used.
- Q.1-9 See Tables 1 and 2 containing the Company's commodity price forecasts.
- a. Please provide all analyses and workpapers, electronically with all formulae intact that were used to create the commodity prices in Tables 1 and 2, and extend out the data to 2049, the end of the production cost modeling period. Also supply the Company's underlying Henry Hub forecast.
  - b. Provide the same information as in the last question, but provide it in nominal dollars instead of 2018\$.
- Q.1-10 Please provide the workpapers, electronically with all formulae intact that were used to create Figures 14 and 15 on pages 58 and 59, respectively, concerning solar resources.
- Q.1-11 For every table or graph presented in Section 4, between pages 79 and 82, and on pages 93, 98, 99, 102, 103, and 105, please provide all workpapers used to create the tables and graphs. Please supply the information electronically with all formulas intact. If actual analyses had to be performed please do not just supply pasted values but provide the analyses themselves with live cells.
- Q.1-12 At page 92, the Company discusses the screening process that was performed to reduce the number of resource options evaluated. Please provide the modeling analyses, electronically with all formulae intact that were performed to screen out alternatives for its later Plexos analysis.
- Q.1-13 On page ES-4, the Company discusses the use of STMP to meet customers' requirements.
- a. Please provide the range of options this would include. Note that on page 41, the Company mentions that this could include a bilateral purchase or other means yet to be determined. Again, please provide additional information indicating what these options might look like.
  - b. Identify all STMP resources the Company has acquired over the last 10 years and describe the purchases.
- Q.1-14 See page 99, in which the Company stated, "*due to the Company's understanding of the availability of third-party capacity purchases it is appropriate to limit the availability of this resource through 2024.*"
- a. Explain how the Company came to have this understanding and provide any documents the Company relied on in reaching this conclusion.
  - b. Is it the Company's position that no third-party capacity purchases could be arranged for longer than through 2024, or that if they could be arranged the price would be significantly higher? Please explain further about the Company's understanding of the availability of these resources and if the Company believe the cost would be high, please

provide an estimate of the cost to acquire those resources longer over a longer term such as through 2030.

Q.1-15 See page 123 concerning STMP options.

- a. Please define what the Company means by “*uncertainty in the PJM capacity market*”, which led the Company not to include STMP options beyond 2024.
- b. If the Company were concerned about the uncertainty of whether market participants would be willing to add capacity to the market, wouldn’t that imply that the Company’s fundamental commodity price forecast on page 4 (Table 1) would have included significant growth in market prices over time. Instead the table shows capacity prices that are relatively flat over time. Please explain in detail.

Q.1-16 See Figure 49 and 50 on page 141. Provide justification for the Company’s increasing dependence on market energy purchases through 2034, while at the same time not allowing any market capacity purchases after 2024. What factors allow the Company to depend on market energy purchases after 2024 but not market capacity purchases?

Q.1-17 At page 101, the Company states, “*A limit on solar capacity additions is needed because as solar costs continue to decrease relative to the market price of energy there will come a point where the optimization model will theoretically pick an unlimited amount of solar resources.*” Please explain how it could be that an unlimited amount of solar resources could be picked.

Q.1-18 At page 56, the Company discussed the Bloomberg New Energy Finance’s Renewable Energy Market Outlook forecast and then at page 101, the Company indicated it based its solar assumptions on that forecast. Please provide that forecast and supply all workpapers associated with Figure 29 containing Solar Resource Pricing. Ensure that all assumptions and calculations that resulted in the levelized cost of energy are supplied.

Q.1-19 Regarding the new solar resources that the Company selected to add in 2023.

- a. Were those resources modeled as generic resources or were they modeled as new generating capacity that included “*significant capital expenditures for transmission interconnection costs?*” See page 111 where transmission costs are discussed.
- b. Please provide an estimate of the complete transmission interconnection and upgrade costs that will be required to interconnect the solar projects in 2023. A high-level estimate would be fine if that is all the Company has available.
- c. Provide a breakdown of all costs the Company expects to incur in adding the solar resources in 2023.

Q.1-20 Regarding Figure 41, CPW comparison, provide all workpapers used to create that Figure, electronically, with all formulae intact.

Q.1-21 Explain how CO2 costs associated with the SMTP purchases were modeled and how CO2 costs were accounted for when purchases from the market or sales to the market were made. Please provide an example of how those costs were derived.

- Q.1-22 Please provide all workpapers used to derive the bill impacts shown on page 133 and the Rate Impacts on page 134 (Figure 43 and Table 18, respectively), electronically with all formulae intact.
- Q.1-23 Provide the workpapers, electronically, with all formulae intact to derive the risk analysis factors and relationships in Table 19 on page 135, and Figure 44 on page 136. Also, why is the stochastic minimum for Short Term Capacity Prices \$0 throughout the study period in Figure 44?
- Q.1-24 Provide all tables and graphs included in Exhibit D, new generation technologies. Also provide all workpapers created to produce those tables and graphs and provide this electronically with all formulae intact. If actual analyses had to be performed please do not just supply pasted values but provide the analyses themselves with live cells, such as the LCOE calculations..
- Q.1-25 Provide all tables and graphs included in Exhibits E1. Also provide all workpapers created to produce those tables and graphs and provide this electronically with all formulae intact. If actual analyses had to be performed please do not just supply pasted values but provide the analyses themselves with live cells.
- Q.1-26 The Company assumed that solar resources would have a 51% capacity value.
- a. Provide the latest PJM solar capacity value assumption and reference documentation where its assumption may be found.
  - b. Provide all workpapers, assumptions, analyses, etc., electronically, with all formulae intact that the Company developed in determining that 51% would be appropriate to use for the capacity value of its solar resource options.
  - c. Provide any benchmarking evaluations the Company performed to validate the reasonableness of its 51% assumption, such as by comparing its value to other utilities' assumptions.
- Q.1-27 The Company assumed that solar resources would have a capacity factor of 24% because that "is representative of a tracking solar resource located in Jackson, Kentucky.
- a. Provide all workpapers, assumptions, analyses, etc., electronically, with all formulae intact that the Company developed in determining that 24% would be representative of a tracking solar resource located in Jackson Kentucky.
  - b. How did the Company account for degradation in its Plexos modeling analysis? Please provide all assumptions that were made.
  - c. Provide any benchmarking evaluations the Company performed to validate the reasonableness of its 24% assumption, such as by comparing its value to other utilities' assumptions.
- Q.1-28 At pg. 40 of the IRP Report, the Company states that its resources will begin to transition to the capacity performance rules starting in the 2019/20 planning year and will be held to stricter requirements than current capacity resources.
- a. What modeling assumptions in any of the Company's IRP analyses were impacted by the capacity performance rule changes.

- b. Please provide a comparison of what the assumption would have been with and without the capacity performance rule changes.

Q.1-29 Regarding more recent forecasts.

- a. If the Company has produced more recent Fundamentals Forecasts, please provide all analyses used to create the most recent version, and provide it electronically, with all formulae intact. Supply the forecasts in both nominal and real dollars.
- b. If the Company has produced more recent load forecasts, please provide the most recent peak demand and energy forecasts.
- c. If any other more recent forecasts have been developed, please identify such forecasts.

Q.1-30 For the most recent 12-month period, please provide the Rockport Unit Power invoices.

Q.1-31 For the most recent 12-month period, please provide the Transmission Accounts settlement invoices submitted to Kentucky Power under the Transmission Agreement.

Q.1-32 Please refer to Sections 4.4.3.4 and 4.4.3.5. Please describe AEP's current policy for pricing back-up service to cogenerators who experience unplanned outages. Please describe AEP's current policy for pricing maintenance service to cogenerators during planned outages.

Q.1-33 Please refer to Section 3.5.8.

- a. For each transmission project listed, please provide the actual or forecasted cost.
- b. For 2020, 2021 and 2022, please provide Kentucky Power's forecasted transmission rate base.

Q.1-34 Will any of the transmission projects listed in Section 3.5.8 be owned by AEP Kentucky Transmission Company? Please explain.

Q.1-35 Please explain how the costs of AEP Kentucky Transmission Company are included in the rates of Kentucky Power.

Q.1-36 Please explain how the costs of AEP Kentucky Transmission Company are handled in the AEP Transmission Agreement.



Q.1-37 For the years 2020, 2021 and 2022, please provide the forecasted transmission rate base of AEP Kentucky Transmission Company.

Respectfully submitted,



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