

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2022 INTEGRATED RESOURCE )  
PLAN OF EAST KENTUCKY POWER ) CASE NO. 2022-00098  
COOPERATIVE, INC. )  
)

**INITIAL DATA REQUESTS OF JOINT INTERVENORS  
KENTUCKIANS FOR THE COMMONWEALTH, KENTUCKY SOLAR ENERGY  
SOCIETY, AND MOUNTAIN ASSOCIATION PROPOUNDED TO EAST  
KENTUCKY POWER COOPERATIVE, INC.**

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Mountain Association*

Dated: June 30, 2022

## DEFINITIONS

1. "Document" means the original and all copies (regardless of origin and whether or not including additional writing thereon or attached thereto) of any memoranda, reports, books, manuals, instructions, directives, records, forms, notes, letters, or notices, in whatever form, stored or contained in or on whatever medium, including digital 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 business address, and 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.), identifying number, 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 and why it was so disposed.
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 data requests 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 other 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. "EKPC" or "the Company" means East Kentucky Power Cooperative, Inc. and/or any of their officers, directors, employees or agents who may have knowledge of the particular matter addressed, and affiliated companies.

12. "Joint Intervenors" means the Mountain Association, Kentuckians For The Commonwealth, and Kentucky Solar Energy Society, who were granted the status of full joint intervention in this matter.

13. "Cryptocurrency operation" means any facility, operation or location that uses computers, machines or other equipment to generate, validate, maintain, and/or authenticate cryptocurrency transactions, ledgers, blockchain and/or hashes, including operations that may be described as data centers or data processing facilities.

## **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 requests for information 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 Joint Intervenors. 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 data request 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.

**INITIAL DATA REQUESTS PROPOUNDED TO EAST KENTUCKY  
POWER COOPERATIVE, INC. BY JOINT INTERVENORS**

- 1.1. Please provide, in spreadsheet format with formulas intact, the workpapers (including input and output files) supporting EKPC's energy requirements and peak forecasts.
- 1.2. At page 27 of IRP Vol. 1, in response to a PSC Staff Recommendation that EKPC "conduct additional sensitivity analyses to investigate alternate variations in input assumptions", EKPC states that it hired Guidehouse to prepare several carbon price forecasts. Please explain how those carbon price forecasts related to the Staff's recommendations on load forecasting.
- 1.3. At page 160 of IRP Vol. 1 (pdf190), EKPC states: "This forecast was approved by the EKPC Board of Directors in December, 2020, and was approved by the Rural Utilities Service ('RUS')."

At page 1 of the Technical Appendix, Section 1.0, EKPC states "EKPC's '2021-2035 Load Forecast' was prepared pursuant to its Work Plan, which was approved by both EKPC's Board of Directors and by RUS in December 2019."

- a. Please clarify the month and year in which the EKPC Board of Directors approved the load forecast used in the IRP.
- b. Please provide a copy of EKPC's most recent RUS-approved Work Plan.

- 1.4. Refer to page 1 of the Technical Appendix – Load Forecast, which states “IHS Global Insight, Inc. (‘IHS’) released an updated outlook in June 2020.”
  - a. On the same page, EKPC states: “Factors considered in preparing the forecast include national, regional, and local economic performance, population and housing trends, service area industrial development, electric price, household income, appliance saturations and efficiencies, demand-side management programs, and weather.” Please identify which among the listed factors considered in preparing the load forecast is sourced from IHS’s June 2020 outlook.
  - b. To the extent of your knowledge, has IHS updated its outlook since June 2020? If so, please list the month and year of each such updated outlook.
  
- 1.5. Refer to page 2 of the Technical Appendix – Load Forecast, which states: “Having actual energy for most of 2020, energy for 2020 was estimated outside of the construct of the model using insights from the owner-members and analysis of recent impacts due to COVID-19. To prevent skewing the growth rates, 2020 has been excluded from the calculations.”
  - a. Did you perform any load forecast calculations that included calendar year 2020 forecast or actual data? If so, please provide the results of that analysis.
  - b. Please quantify, to the best of your ability, the degree to which including 2020 data would “skew” the load forecast.
  - c. Please clarify if the decision to exclude the 2020 load data from the load forecast was made internally by EKPC or as part of the larger RUS load forecast development process.
  - d. Has EKPC ever taken the decision to remove a complete year of data from its load forecasting sample in the past? For example, the years associated with the Great Recession, the Polar Vortex, or years containing similar events.
  
- 1.6. Please provide load forecasts developed after December 2020, if any.
  
- 1.7. Please explain in full each change, if any, to the load forecast methodology, as reflected in Vol. I Technical Appendix – Load Forecast, as compared to each of the following:

- a. The load forecast methodology used in EKPC's 2018 Load Forecast and 2019 IRP, filed with the Kentucky Public Service Commission in Case No. 2019-00096.
- b. The load forecast methodology used in EKPC's 2014 Load Forecast and 2015 IRP, filed with the Kentucky Public Service Commission in Case No. 2015-00134.
- c. The load forecast methodology used in EKPC's 2010 Load Forecast and 2012 IRP, filed with the Kentucky Public Service Commission in Case No. 2012-00149.

1.8. Please provide the following information on an annual basis for each of the years 2020 and 2021:

- a. Total energy requirements (MWh)
- b. Total energy requirements disaggregated by customer class (MWh)
- c. Percent increase (or decrease) in total energy requirements relative to the preceding year
- d. Actual annual load factor (%)
- e. Actual winter peak demand (MW)
- f. Actual summer peak demand (MW)

1.9. Please provide the following information for the period January 1, 2022 through June 30, 2022:

- a. Total energy requirements (MWh)
- b. Total energy requirements disaggregated by customer class (MWh)

1.10. For each customer class reflected in Table 3-10, please provide the historical average growth rates from 2010 to 2022.

1.11. Refer to Table 3-4, titled "Class Sales". Please provide Owner-Members' Form 7 data for 2021, and an updated version of Table 3-4 including 2021 actual data in native, machine-readable format with all formulae intact.

1.12. Refer to Table 3-5, titled "EKPC Recorded Annual Energy Sales (MWh) and Energy Requirements (MWh) 2016–2020". Please provide Owner-Members' Form 7 data for 2021, and an updated version of Table 3-5 including 2021 actual data in native, machine-readable format with all formulae intact.

1.13. Refer to Technical Appendix, Vol. I – Load Forecast at page 16, which states:

Electricity Rates: The wholesale power cost projections are based on EKPC's 2019 Integrated Resource Plan filing with the Kentucky Public Service Commission. Each owner-member provides a projection of the distribution adder for the retail rate assumption used in the individual owner-member models."

Please answer the following:

- a. Please identify the month and year when the wholesale power cost projections in EKPC's 2019 IRP were finalized.
- b. Has EKPC updated its wholesale power cost projections since its 2019 IRP filing with the Kentucky Public Service Commission?
  - i. If so, please produce each such projection.
  - ii. If not, please explain why, in EKPC's view, it is reasonable to rely on wholesale power cost projections that are more than two years old.

1.14. Does EKPC's load forecast assume the development of any cryptocurrency operations? If so, please identify each operation and explain your assumptions in full along with supporting analyses, workpapers, and documentation (in machine-readable format with formulas intact).

1.15. Do the load forecasts of any individual member-owner assume the development of any cryptocurrency operations? If so, please (a) identify each member-owner forecasting cryptocurrency operations in their distribution service territory, (b) identify each existing and expected cryptocurrency operation in each member-owner's service territory, and (c) explain your assumptions in full along with supporting analyses, workpapers, and documentation (in machine-readable format with formulas intact).

1.16. Do EKPC's generation assets currently serve any cryptocurrency operations? If so, please answer the following:

- a. Please identify the amount of load or capacity factor attributable to cryptocurrency operations on an annual basis for each of 2019, 2020, 2021, and 2022 (to date).
- b. Please describe the peak load or capacity factor attributable to cryptocurrency operations served by EKPC in each of 2019, 2020, 2021, and 2022 (to date).

- c. Has the addition of load from cryptocurrency operations impacted the capacity factors of any EKPC generation resources? Please explain why or why not in full, including the specific unit(s) impacted, the direction and magnitude of changes in capacity factor, and any implications with respect to fuel, operation, and maintenance expenses.
- d. Has EKPC incurred any capital costs or other costs in relation to serving new load from cryptocurrency operations? If so, please describe each such expense in full, including dollar amount, purpose, and forecasted return.
- e. Do any cryptocurrency operations participate in EKPC's DSM programs? If so, please identify each program that cryptocurrency operations participated in, the number of cryptocurrency operations participating in each program, and the dollar value of incentives or rebates paid to participating cryptocurrency operations (in the aggregate and on average).

1.17.Regarding RTSim, please answer the following questions and requests:

- a. Does EKPC know of any other users of RTSim? If so, please list those users.
- b. What is EKPC's annual cost to license RTSim?
- c. What technical support, if any, is provided by RTSim's vendor?
- d. What are the typical run times for an RTSim simulation?
- e. Does RTSim have any data auditing or other QA functionalities?
- f. What data format is needed for input files, e.g., CSV, text, etc.?
- g. What data output formats are available in RTSim?
- h. Does RTSim use hourly chronology or load duration curves?
- i. How is the RTSim topology set up to capture interactions with PJM?
- j. Can RTSim represent more than one resource sharing an inverter? Please explain in full.
- k. Can RTSim dispatch energy limited resources based on price or does a shape have to be specified?
- l. Are the Monte Carlo simulations sequential?
- m. What does EKPC mean when it says this IRP used the "statistical load methodology"? What other methodologies are available?

1.18. At page 162 of the IRP Vol. 1, EKPC states "There is one set of load data in the model, which was created from the EKPC Load Forecast. Around this forecasted load, a range of distributions created four additional loads to define the high and low range of the potential loads to be examined. The model draws load data a few days at a time from the different forecasts (to represent weather patterns) to assemble the hourly loads to be simulated."

- a. Is the load sampling connected to any specific weather patterns given to the model? If so, please explain how this was accomplished and provide any supporting documentation.
- b. How are the market prices, natural prices, coal prices, and emissions costs correlated to load? Please explain in full.
- c. Please provide the load distributions described in these sentences.

1.19. Does RTSim's Resource Optimizer use dynamic or integer programming? If the latter, how does the model develop "a large number of potential resource plans"? Please explain in full.

1.20. How are capital costs treated in Resource Optimizer, i.e., as revenue requirements, levelized project costs, or some other methodology? Please explain in full.

1.21. Does Resource Optimizer calculate the net present value of revenue requirements or the net present value of system cost? Please explain in full.

1.22. To what type of iterations is EKPC referring when it says, "...the Resource Optimizer was set to try up to 2500 unique expansion plans, with each of those simulated with 5 iterations"? Please explain in full.

1.23. On page 162 of the IRP Vol. 1, when EKPC says "Five hundred (500) iterations are used in the model simulations" does that mean 500 per portfolio or 500 total across all portfolios? Please explain in full.

1.24. Refer to Table 8-4, titled "DSM AFFECTED BASE RESOURCE OPTIMIZATION.

- a. Please explain what is shown in Table 8-4, including explaining the relevance of "DSM AFFECTED" in the table title.
- b. Please provide the spreadsheet with all formulas and links intact that was used to create Table 8-4.

- 1.25. Did EKPC model any additional, future DSM in any portfolio? If not, why not? If so, what did EKPC model? Please explain in full.
- 1.26. Regarding the Load Research Program (discussed in IRP section 3.7), please answer the following:
- a. Does the EKPC load research program include any residences or commercial customers who are net metering customers, who use battery-back-up systems or who own electric vehicles? If yes, please provide the load data gathered from those customers over the past five years.
  - b. Does the Smart Home Pilot provide metering of specific circuits and appliances within the home, so as to determine actual energy use per appliance (e.g., heating, cooling, water heating, plug loads, lighting, etc.)? Please explain.
  - c. Please provide the data gathered for all customers participating in the load research and smart home pilot for the preceding 5 years.
- 1.27. Please refer to pages 2, 3, and 34 of the IRP where it is implied that EKPC must incorporate the effects of electric vehicle penetration to adequately serve load for customers. However, on page 29 of Technical Appendix Volume 1, EKPC reported that over 94% of its customers had no plans to acquire an electric vehicle. Please answer the following:
- a. Did EKPC adjust its load forecast for future electric vehicle penetration?
  - b. If so, please provide the data and assumptions used by EKPC to estimate future electric vehicle adoption.

1.28. Refer to page 35 of the 2022 IRP, particularly the statement that “the U.S. electric vehicle market is expanding rapidly and there will be increased infrastructure demand in Kentucky particularly along highway corridors within EKPC territory. . . . While projected adoption of EVs is predicted to be slower in Kentucky in comparison to other states (and in particular EKPC territory), EKPC recognizes that even modest increases in EV load in concentrated areas could provide challenges and opportunities for EKPC and its owner-members.”

- a. Please identify and produce the source relied on by EKPC when it represents that adoption of EVs is predicted to be slower in Kentucky generally and in particular in EKPC’s territory.
- b. To EKPC’s knowledge, how many EVs are currently owned and operated in EKPC territory?

1.29. For each of EKPC’s coal-fired units, please provide the following historical annual data by unit, or, if EKPC does not maintain unit-level data, by plant, from 2012 to present:

- a. Fixed O&M cost
- b. Variable O&M cost
- c. Fuel costs
- d. Capital costs
- e. Heat rate
- f. Generation
- g. Capacity rating
- h. Capacity factor
- i. Forced outage rate
- j. Planned outage rate
- k. Energy revenues
- l. Capacity revenues
- m. Ancillary services revenues.

1.30. For each existing coal-fired unit, please provide the following projected annual data by unit, or if EKPC does not maintain unit-level data, by plant, for the economic analysis period in this filing (i.e., 2022–2036):

- a. Fixed O&M cost
- b. Variable O&M cost
- c. Fuel costs
- d. Capital costs
- e. Heat rate
- f. Generation
- g. Capacity rating
- h. Capacity factor
- i. Forced outage rate
- j. Planned outage rate
- k. Energy revenues
- l. Capacity revenues
- m. Ancillary services revenues.

1.31. Please confirm if EKPC is modeling the thermal resources on a UCAP or ICAP basis, and provide the following information for each of EKPC's thermal units:

- a. Forecasted annual capital expenditures
- b. Summer and Winter capacity contributions
- c. Forced outage rates for the last five years
- d. Forecasted forced outage rates

1.32. Please provide the most recent condition assessment report for each of EKPC's thermal generating units.

1.33. For each of the Companies' existing coal-fired units, please produce the most recent estimate that the Companies have prepared or caused to be prepared of the capital and O&M costs to comply with the following regulations:

- a. Acid deposition control program
- b. Cross State Air Pollution Rule
- c. Mercury and Air Toxics Standards
- d. Combustion turbine NESHAP rule
- e. NAAQS
- f. Regional Haze rule
- g. Greenhouse gas regulations
- h. 316(b) cooling water intake rule
- i. Effluent Limitations Guidelines
- j. Any new definition of waters of the United States
- k. Coal Combustion Residuals rule
- l. Pending enforcement actions by citizen groups or regulatory agencies of any state and/or federal environmental requirements.

1.34. For each of the Companies' existing coal-fired units, please provide the capital and O&M costs projected to be incurred each year from 2022 through 2036 to comply with the following regulations:

- a. Acid deposition control program
- b. Cross State Air Pollution Rule
- c. Mercury and Air Toxics Standards
- d. Combustion turbine NESHAP rule
- e. NAAQS
- f. Regional Haze rule
- g. Greenhouse gas regulations
- h. 316(b) cooling water intake rule
- i. Effluent Limitations Guidelines
- j. Any new definition of waters of the United States
- k. Coal Combustion Residuals rule
- l. Pending enforcement actions by citizen groups or regulatory agencies of any state and/or federal environmental requirements.

1.35. Please provide unredacted versions of the tables shown on pages 104–110, in native machine-readable format with formulae intact.

1.36. Refer to Tables 7-1, 7-2, 7-3, and 7-4.

- a. Please provide the estimated cost for each individual major project listed in each table.
- b. For each cost estimate provided in response to subpart (a), please specify the degree of cost certainty (e.g., using the cost estimate classification system of AACE International or other commonly-used cost certainty methodology).

1.37. Please answer the following questions regarding EKPC's landfill gas generation resources:

- a. Does EKPC own and operate the landfill gas facilities, or does EKPC purchase the power from each facility from a third-party owner and operator? Please explain.
- b. Please identify the expected operational life for each landfill gas facility.
- c. Please provide the forecasted annual energy generation through the expected operational life for each landfill gas facility.
- d. Has EKPC evaluated the potential for developing additional landfill gas facilities in its service area or in Kentucky? If so, please produce each such evaluation. If not, please explain why not.
- e. In EKPC's estimation, what is the maximum technical potential for landfill gas generation in EKPC's service territory? Please explain.

1.38. Did EKPC evaluate any of its existing generation units for retirement?

- a. If yes, please identify each unit evaluated for retirement and describe EKPC's methodology for evaluating optimal retirement timing.
- b. Please identify the assumed retirement date for each generating unit in EKPC's portfolio and state whether that assumed retirement date is consistent with EKPC's most recent depreciation study, filed with the Kentucky Public Service Commission in Docket No. 2021-00103.

- 1.39. On page 161 of the IRP it is stated that, "Market and fuel prices are updated on a regular basis to ensure that current expectations are being modeled in the analysis. Fuel and market cost assumptions and projections were developed in the Fall 2021 in order to have adequate time to robustly evaluate integrated resource plan alternatives." Please provide the market and fuel commodity prices used by EKPC to evaluate the 2022 IRP.
- 1.40. Please provide, in spreadsheet format with all formulas and links intact, the RTSim input and output files used in the production of this IRP.
- 1.41. Please provide any RTSim model documentation in EKPC's possession, including, but not limited to the user manual.
- 1.42. If RTSim outputs were post-processed in any way, please provide those spreadsheets with all formulas and links intact.
- 1.43. Please explain if short term market purchases were available in the capacity expansion modeling. If purchases were allowed, please provide the annual amount and cost that was available for selection.
- 1.44. How were the Guidehouse carbon prices incorporated into the IRP modeling, if at all?
- 1.45. At page 24 of the IRP, EKPC states "The 2022 IRP preparation however added an additional external step to ensure EKPC's ability to meet its sustainability goal of 15% of new renewable energy in 2035..."
- What is EKPC's current progress towards meeting this goal?
  - Why are any new renewables missing from Table 1-4 page 25?
- 1.46. Refer to Table 1-3, titled "DSM Impacts", which shows forecasted DSM impacts for the first five years in the load forecast used in the 2022 IRP and the load forecast used in the 2019 IRP.
- Please confirm that, with respect to the rows reporting values from the 2022 IRP, "Year 1" refers to 2023. If anything but confirmed, please identify what year is reflected as "Year 1" of the 2022 IRP in Table 1-3.
  - Please confirm that, with respect to the rows reporting values from the 2019 IRP, "Year 1" refers to 2019. If anything but confirmed, please identify what year is reflected as "Year 1" of the 2019 IRP in Table 1-3.

1.47. Refer to page 35 of the IRP (pdf page 52), particularly the paragraph discussing provisions in the infrastructure law related to energy efficiency.

- a. What percentage of residential customers served by EKPC's 16 owner-members would meet the income qualifications for low-income home weatherization?
- b. Please explain in full how federal spending on energy efficiency in EKPC's service territory is expected to impact EKPC's load forecast. If no analysis of impacts has been performed, please explain why not.
- c. Please explain whether and the cost-effectiveness of EKPC's EE/DR programs will be impacted by the infrastructure law.
- d. EKPC states that "Kentucky, and Kentucky-based recipients are likely to receive a portion of these federal monies." To the best of EKPC's knowledge, what is the possible amount of federal energy efficiency funding expected for (i) Kentucky as a whole and (ii) EKPC's service territory.
- e. Does EKPC agree that it is in the best interests of its owner-members' retail customers to maximize the federal investment of energy efficiency resources in EKPC's territory? If EKPC disagrees, please explain in full the basis for your disagreement.

1.48. Refer to page 35 of the IRP, particularly the paragraph discussing provisions in the federal infrastructure law related to grid modernization.

- a. EKPC states that it "is still awaiting additional information as to how these resources will be distributed and for what specific purposes the dollars can be used." Please provide any updated details along these lines.
- b. Please explain the potential grid hardening and resilience projects that EKPC is considering in relation to these grid modernization funds.
- c. Please elaborate on EKPC's expectations with respect to cybersecurity for electric cooperatives under the federal infrastructure law (e.g., resources available, allowed uses, process, timeline, etc).

- 1.49. Refer to pages 178–179 of the 2022 IRP, discussing the Biden Administration’s particular focus on environmental justice, and explaining: “EKPC’s service area includes a significant number of end users in economically distressed communities. As such, there may be opportunities for increased funding directed toward bringing energy and efficiency programs to those areas, through RUS electric programs.”
- a. Please identify and explain the specific energy and efficiency programs in the above-referenced statement.
  - b. Please describe EKPC’s efforts to support or engage with the referenced energy and efficiency programs.
  - c. Please describe the amount of current funding to the referenced energy and efficiency programs and the portion of that funding available in EKPC’s service area.
  - d. What is the magnitude of the potential funding increase?
- 1.50. Please provide the impact that EKPC’s demand-side management programs have had on each of (a) winter peak, (b) summer peak, and (c) energy requirements on an annual basis over the most recent ten year period.
- 1.51. Please answer the following questions relating to the Load Impacts of DSM Programs, presented at pages 115–119 of the 2022 IRP:
- a. Do columns labeled “Participants” reflect new participants in each year or cumulative participants dating from 2022 forward? Please explain.
  - b. Are the impacts on Total Requirements, Winter Peak, and Summer Peak reflecting only new participants in each year, or cumulative impacts for all participants since 2022 (or some other baseline year)? Please explain.
  - c. What is the basis for the assumed number of participants each year?
  - d. On what basis did EKPC select participation rates which fall below the Maximum and Realistic Achievable Potential of these programs? Please explain in full.
  - e. For each DSM program, please explain whether the cost-benefit (or cost-effectiveness) analysis is affected by the number of participants? Please continue to explain how the DSM analysis considered economies of scale, in which greater market penetration can create economic benefits that reduce per unit cost of saved energy.
  - f. Has EKPC researched and performed cost-benefit analysis on different strategies for implementing DSM programs, to identify

potential cost-effective methods to increase program participation? Please explain in detail and produce each such analysis or study.

- g. Has EKPC issued an RFP for DSM service providers, with the intent to solicit proposals for achieving greater participation rates, in line with the Maximum and Realistic Achievable Potential? If so, please provide that RFP and responses thereto. If not, please explain why not.
- h. Refer to the table at page 116, reflecting the forecasted load impacts of the Heat Pump Retrofit program. Please explain the basis for assuming no impact on winter peak demand, including supporting documentation and workpapers, if any.
- i. Refer to the table at page 118, reflecting the forecasted load impacts of the Residential Energy Audit Program. Please explain why assumed participants, impact of total energy requirements and impact on seasonal peak demand are flat from 2026 onward.

1.52. Who implements DSM programs for EKPC and its owner-members? Are the programs operated by EKPC, the individual owner-members, or third-parties? Please answer for each individual DSM program.

1.53. Refer to Table 5-3, titled "DSM Program Costs." Please clarify whether the program costs provided in Table 5-3 are intended to reflect annual costs, cumulative costs over the IRP planning period, or some other time scale. Please explain.

1.54. Please provide workpapers relied on to develop Table 5-4, titled "DSM Program Cost Savings" in native, machine-readable format with formulae intact.

1.55. Refer to Technical Appendix Vol. 2 at page DSM-6, which states that “EKPC sponsored multiple EKPC DSM Collaborative meetings in 2021 to review all energy efficiency and demand response measure cost-effectiveness results and obtained input from the Collaborative representatives pertaining to DSM program changes.”

- a. Please clarify whether the referenced “DSM Collaborative” is synonymous with or distinct from the “Sustainability Collaborative” mentioned elsewhere in the IRP materials.
- b. Please identify the dates of the referenced EKPC DSM Collaborative meetings in 2021.
- c. Please identify the individuals and organizations that participated in each meeting identified in response to subpart (b).
- d. Please produce any presentations or materials EKPC distributed to the DSM Collaborative in 2021 and 2022.
- e. Please produce any notes or other records in EKPC’s possession detailing input obtained from the Collaborative representatives pertaining to DSM program changes.

1.56. In Technical Appendix Volume 2, Ex. DSM-2, EKPC provides annual DSM reports for program years 2018, 2019, and 2020. Please provide the 2021 annual DSM report.

1.57. Refer to Technical Appendix Volume 2, Ex. DSM-6. Please clarify what annual DSM budget level is assumed in the derivation of program load impacts provided in Ex. DSM-6. (e.g., the base case \$3 million budget scenario).

- 1.58. For each of the energy efficiency and demand response programs included in EKPC's 2022 IRP, please answer the following requests:
- a. Please explain in detail how avoided costs were determined for each cost benefit test used (e.g., Total Resource Cost Test, Utility Cost Test, Participant Cost Test, Rate Impact Measure Test, Societal Cost Benefit Test)
  - b. Please provide the values used for each element of the avoided cost categories listed below. Please provide the source of the values used and state whether the values are in nominal dollars or in real, inflation-adjusted dollars.
    - i. Energy cost
    - ii. Capacity cost
    - iii. Capacity reserves (if not included in capacity costs)
    - iv. Natural gas price
    - v. Environmental externalities, including avoided methane loss from gas transmission, distribution, and storage infrastructure
    - vi. Line losses, for energy and peak (please specify if the estimate is based on average or marginal line loss rates)
  - c. Please state whether any of the following avoided cost categories listed below are included in the Companies' avoided cost calculation and if so, please provide the value, source of the value, and state whether the value is in nominal dollars or in real, inflation-adjusted dollars.
    - i. Ancillary services
    - ii. Transmission and distribution
    - iii. Non-energy benefits ("NEBs") (please specify which NEBs are included, if any)
    - iv. Increased reliability
    - v. Reduced risk (e.g., reduced exposure to future fuel price volatility, future environmental regulation compliance costs, uncertainties of demand forecasts and related capital investments, etc.)
    - vi. Reduced credit and collection costs
    - vii. Reduced pollution or environmental damage
    - viii. Reduced negative health impacts
    - ix. Any other avoided cost values incorporated into cost-effectiveness analysis.

- 1.59. Refer to Exhibit DSM-1, 2021 Potential Study prepared by GDS Associates, Inc.
- a. Please define each of the terms (i) maximum achievable potential and (ii) realistic achievable potential.
  - b. Please (i) list each factor or variable used in the derivation of realistic achievable potential that differs from the factor(s) or variable(s) used in the derivation of maximum achievable potential, and (ii) explain in full the basis for each changed factor or variable.
  - c. As applied in the referenced document, is the “maximum achievable potential” equivalent to “achievable potential”? If not, please explain in full each difference between the two terms.
- 1.60. At page 10 of the IRP, EKPC states it “has re-evaluated all of its DSM programs for cost-effectiveness. Some programs have been eliminated and others have been modified.”
- a. Please provide the analysis referred to in these sentences.
  - b. Please explain why EKPC chose to eliminate programs rather than attempt to modify them in order to become cost-effective? Please provide any documents that support your response.
  - c. Please explain in full why no new DSM programs are being proposed.
- 1.61. In EKPC’s view, have participation levels in its DSM programs materially changed over the last 5 years or the last 10 years? Please explain what changes EKPC has observed, if any, including EKPC’s opinion on the driver(s) of those changes.
- 1.62. How, if at all, did GDS’ Potential Study influence the recommended DSM plan given on page DSM-17 of Volume 2? Please explain in full.
- 1.63. Please provide Appendices A and B of the GDS potential study in electronic spreadsheet format.

- 1.64. Please answer the following questions related to EKPC's commercial and industrial customers:
- a. When a new commercial or industrial customer is added to the EKPC system, what options for interruptible, direct load control, or other similar service are provided to that customer? Please explain in full.
  - b. If interruptible, direct load control, or other similar tariffs are available, are their credits and assumptions informed by any avoided cost data, e.g., PJM energy and capacity prices? Please explain in full.
  - c. Please provide a breakdown of peak MW and MWH of industrial load by sector and season. This could be provided using NAICS or SIC or a comparable segmentation.

1.65. At page 33–34 of the IRP, EKPC states “At maximum, Energy Efficiency may receive compensation for four delivery years of capacity value if it were planned and not yet implemented before the start of the first delivery year....participation in the RPM capacity market would not provide monetary value to offset any implementation costs. Because EKPC territory is a single zone in the PJM region, and no other load serving entities serve load in our zone, we would derive no financial compensation from our Energy Efficiency clearing in the market. To be able to treat Energy Efficiency (a load reducer) as a supply resource that competes against generation, PJM scales up the load in the zone. Effectively, the energy efficiency would be an offset to the load allocated to us. Moreover, participation could be a cost because PJM has established measurement and verification requirements to ensure that the Energy Efficiency provides the capacity value for which it would be paid. Those requirements are complex, and EKPC would incur a cost to produce the required evaluation and reports.”

- a. From EKPC's perspective, how, if at all, are the capacity deferral and energy demand reduction benefits of energy efficiency realized by EKPC?
- b. What is EKPC's position on the benefits of registering demand response resources with PJM? If different than its position on energy efficiency, please explain why.
- c. What is EKPC's understanding of how the impacts of energy efficiency beyond the first four years of any given measure's life are accounted for by PJM?
- d. Has EKPC done any analysis of the tradeoff between measurement and verification costs and the benefit of

additional market revenue for energy efficiency? If so, please provide that analysis.

- e. Please describe the methodology used by PJM to scale up its zonal load. Please identify any PJM manuals, or reports that detail this methodology. If data additional to the hourly load data are used to undertake this methodology please identify the sources of those data.
- f. Please identify which tables in the PJM January 2022 Load Forecast Report correspond to EKPC's capacity planning, energy efficiency, demand response, and other relevant load forecasting data applied to the EKPC zone. Particularly as it applies to subpart (e) of this question.

1.66. Refer to page 129 of the IRP, specifically the statement that "EKPC expects to see a net overall reduction in system losses as a result of the planned construction of 31.1 miles of new 69 kV line in the 2022–2036 period."

- a. Please quantify the expected net overall reduction in system losses as a result of the planned construction of 31.1 miles of new 69 kV line in the 2022–2036 period."
- b. Please explain in full how the expected net overall reduction in system losses discussed in the referenced statement have been incorporated into EKPC's forecasted energy requirements in the 2022–2036 period.

1.67. Refer to Section 6.0 Transmission and Distribution Planning at page 131, particularly the discussion of merchant-generation facilities in the PJM queue that requested interconnection to the EKPC transmission system, and answer the following questions:

- a. For each of the six projects that have an executed Interconnection Service Agreement, please provide the generation resource type (e.g., stand-alone solar generation facilities or hybrid solar/battery storage facilities) and installed capacity.
- b. Please explain whether and to what extent EKPC considered the potential to enter into power purchase agreements with new merchant-generation facilities seeking interconnection to the EKPC transmission system.
- c. To EKPC's knowledge, are any projects among the total 103 active merchant-generation facilities in the PJM queue requesting interconnection to the EKPC transmission system intended to serve cryptocurrency operations? If so, please

explain the basis for EKPC's knowledge, identify each such project, and describe the project, to the extent possible.

- 1.68. Refer to Section 6.0 Transmission and Distribution Planning at page 133, particularly the statement that "EKPC monitors peak distribution substation transformer loads seasonally to identify potential loading issues for delivery points to owner-members."
- a. Please list peak distribution substation transformer loads where potential loading issues were identified in the last three years (i.e., three most recent summer and winter seasons)
  - b. To EKPC's knowledge, has the addition of new load from cryptocurrency operations caused or contributed to potential or actual loading issues for delivery points to owner-members? If so, please identify each such instance, the impacted delivery point(s), and the impacted owner-member(s); and explain in detail the measures undertaken by EKPC in response.
- 1.69. Refer to Section 6.0 Transmission and Distribution Planning at page 134, particularly the discussion of planned improvements to EKPC distribution substations for the 2022–2025 period, and Tables 6-10 and 6-11.
- a. Among these planned improvements and additions to EKPC distribution substations, please identify each project necessary to meet growing member demand, including identification of the specific owner-member(s)
  - b. Among these planned improvements and additions to EKPC distribution substations, please identify each project intended to serve new load from cryptocurrency mining operations.
- 1.70. Refer to the bulleted list of transmission expansion projections from 2019-2021, provided at page 127 of the 2022 IRP.
- a. For each listed project, please specify whether it was required to meet PJM criteria or EKPC's criteria to meet local planning needs (as discussed at the top of page 125).
  - b. Please identify which among the listed projects are "supplemental projects" (i.e., projects resulting from local planning criteria that are provided to PJM for inclusion in the RTEP).
  - c. For each listed project, please describe in full the process and methodology used to determine need, costs, and benefits.

- 1.71. Refer to the bulleted list of transmission expansion projects from 2022 to 2024, provided at page 129 of the 2022 IRP.
- a. For each listed project, please state whether it was developed through a regional planning process or a local planning process.
  - b. For each listed project, please describe in full the process and methodology used to determine need, costs, and benefits.
- 1.72. Please refer to Table 8-5 and provide a description of the difference between the Power Purchase Agreement (“PPA”) and “Seasonal PPA” resources.
- 1.73. Refer to page 8 of the IRP where it is stated that EKPC, “...expects to utilize PPAs to cover the future winter period needs for a hedge against energy price exposure and solar PPAs to meet its sustainability goals on an economic basis. Did the Company incorporate the probability of dispatch of the Solar PPAs during the winter peak into its modeling? If so, please provide the estimated capacity factors of Solar PPAs during these times.
- 1.74. Refer to page 58 of the IRP where it is stated: Solar PPAs were based on expected costs from a recent RFP for solar energy. The PPAs were allowed to annually enter into the model throughout the study period of the capacity expansion study. This allowed solar energy to be compared with market purchases and natural gas resources.
- 1.75. Please provide the following information:
- a. The results of the aforementioned RFP for solar energy.
  - b. The energy prices against which the solar PPAs were compared in spreadsheet format with all formulas and links intact.
- 1.76. Does the Company anticipate securing the firm capacity rights in the execution of future Solar PPAs? Please explain in full.
- a. Please provide a narrative for the Company's plans in securing the firm capacity of future Solar PPAs.
  - b. If the Company does not anticipate securing the firm capacity of future Solar PPAs, is it the Company's intention to register the Solar PPAs as energy-only resources in the PJM footprint?
- 1.77. At page 59 of the IRP Vol.1, EKPC states “The merchant solar facilities are not being built to serve EKPC load.” Please explain what is meant by this statement. What purpose do these facilities then serve?

- 1.78. Please explain why EKPC participates in the RPM rather than satisfying its capacity load obligation through the Fixed Resource Requirement option.
- 1.79. At page 44 of the IRP Vol. 1, EKPC states that the RPM auction “compensates EKPC for any additional capacity supply resources that clear in the auction.” Please explain why excess supply resources can produce revenue to EKPC but energy efficiency cannot (see page 33).
- 1.80. Please provide annual net revenues for 2019, 2020, and 2021 by product type, e.g., capacity, energy, A/S, for each of EKPC’s generating units.
- 1.81. In its 2022 IRP, EKPC repeatedly discusses its belief that conventional generation resources will continue to be required to facilitate the transition to renewable and low/no carbon emitting resources. *E.g.*, 2022 IRP at 36, 40, 160. Please answer the following:
- a. Please provide EKPC’s analysis of potential reliability problems in its territory as a result of increased levels of renewable generation.
  - b. Has EKPC estimated, forecasted, or otherwise sought to identify what level of development of renewable generation resources it believes would cause reliability problems.
  - c. Please describe EKPC’s efforts to facilitate transmission planning necessary to enable greater levels of renewable integration.
  - d. Does EKPC agree that regional transmission planning processes are an important component of ensuring reliability and minimizing the cost of any transmission expansion or transmission upgrades needed to enable greater levels of renewable generation. Please explain the basis for your agreement or disagreement in full.
- 1.82. Refer to the 2022 IRP at page 2, stating that “[a]nother strategic objective is to continue to ensure reliability and affordability of electric service while supporting beneficial electrification and thoughtfully responding to growing pressures to carbonize.” Please describe in full EKPC’s efforts to support beneficial electrification.

- 1.83. Refer to the 2022 IRP at pages 164-165, reporting that “[t]here are currently approximately 9,023 kW of solar voltaic installations within the EKPC service territory taking advantage of the member cooperatives’ net metering tariff. This number continues to grow as solar voltaic prices continue to decrease.”
- a. Has EKPC or its sixteen owner-member cooperatives attempted to forecast distributed solar generation? If so, please provide each such forecast, including supporting workpapers in native format with formulae intact. If not, please explain why not.
  - b. How many metered retail customers are currently using the member cooperatives’ net metering tariff?
  - c. Please explain in full detail how the expected growth in distributed solar generation is incorporated into the load forecast used in this IRP.
  - d. Has EKPC prepared or caused to be prepared an analysis of the potential grid resilience and reliability benefits of distributed solar generation in its territory? If so, please produce that analysis. If not, please explain why not.
- 1.84. Please explain in detail efforts undertaken by EKPC to encourage participation in its Green Energy Tariff.
- 1.85. Refer to page 59 of the 2022 IRP, stating “EKPC continually monitors the solar share program and the interest in that program. Based on participation to date, EKPC does not anticipate expanding that program within the planning horizon of this IRP.”
- a. Is the “solar share program” synonymous with the Green Energy Tariff? If not, please clarify and explain in full.
  - b. Please provide the participation levels in the solar share program over the most recent 5 years.
  - c. Please provide EKPC’s forecast of participation in the solar share program over the planning horizon of this IRP.
  - d. Please specify the level of interest in the program that, in EKPC’s view, would justify expanding the program.
- 1.86. Please provide the forecasted emissions from EKPC’s generation portfolio on an annual basis over the IRP planning period, including, as applicable, carbon dioxide, carbon monoxide, methane, particle pollution, sulfur dioxide, nitrogen oxide, mercury, and arsenic.
- 1.87. Please provide a ranked list of the ten worst performing circuits since the beginning of 2020 in terms of (a) frequency of outages and (b) duration of outages.

1.88. Using data since the beginning of 2020 to the present, please identify the ten zip codes with the highest SAIFI and the ten zip codes with the lowest SAIFI.

1.89. Refer to page 179 of the IRP, acknowledging that "EKPC's service area includes a significant number of end users in economically distressed communities."

- a. Please list the census tracts in EKPC's service area where these economically distressed communities are located. If not available by census tract, please respond using the most granular geographic scale available.
- b. Please state the estimated number of end users in economically distressed communities and the forecasted rate of load growth in those communities.
- c. In EKPC's reply comments in FERC Docket No. RM21-17 (filed November 30, 2021), the Company noted its "unique position of being a member-owned generation and transmission owning electric cooperative serving the needs of customer owned distribution cooperatives in rural Kentucky, including populations that spend over 30% of their income on energy." Please provide EKPC's analysis of energy burden in its service territory.

1.90. Refer to EKPC's Sustainability Plan, including commitments to achieve a 35% reduction in CO2 emissions by 2035 and a 70% reduction in CO2 emissions by 2050.

- a. Please state the baseline emission year.
- b. Please state EKPC's actual CO2 emissions in the baseline year.
- c. Please explain in full detail how EKPC selected the above-referenced percentage reduction thresholds, including an explanation of why the selected thresholds are appropriate targets for EKPC.
- d. Is EKPC also pursuing targeted reductions of other greenhouse gas emissions, including methane emissions, for example? Please explain in full.
- e. In EKPC's estimation, is the portfolio reflected in this IRP capable of achieving a 35% reduction in CO2 emissions by 2035? Please explain in full including production of workpapers and supporting analyses demonstrating achievability.

- 1.91. Refer to EKPC's Sustainability Plan, particularly the commitment to obtain 10% of energy from new renewables by 2030, and to obtain 15% of energy from new renewables by 2035.
- a. Please explain what is intended by "new renewables" including identification of the baseline year.
  - b. Please explain in full detail how EKPC selected the above-referenced percentage reduction thresholds.
  - c. In EKPC's estimation, is the portfolio reflected in this IRP capable of achieving a 10% increase in energy from new renewables by 2030? Please explain in full including production of workpapers and supporting analyses demonstrating achievability.
  - d. In EKPC's estimation, is the portfolio reflected in this IRP capable of achieving a 15% increase of energy from new renewables by 2035? Please explain in full including production of workpapers and supporting analyses demonstrating achievability.
- 1.92. Please list which among EKPC's owner-members offer the Kentucky Energy Retrofit Rider or comparable pay-as-you-save or on-bill financing program, and answer the following questions:
- a. For each participating owner-member and in the aggregate, please provide the following information on an annual basis for each of the most recent three years:
    - i. Number of homes that completed an energy assessment.
    - ii. Number of homes that completed a retrofit.
    - iii. Number of accounts in default.
    - iv. Dollar amount in default.
    - v. Average capital cost per retrofit.
    - vi. Projected savings in kWh.
    - vii. Projected bill savings for retail participants.
    - viii. Average monthly on-bill charge.
  - b. Please provide the forecasted participation and savings rates over the IRP planning period, including production of associated workpapers in native format with formulae intact.

- 1.93. Please list the qualified facilities (under the Public Utilities Regulatory Policies Act) that EKPC currently obtains energy or capacity from, including the following details:
- a. Generation type
  - b. Facility ICAP
  - c. Facility UCAP
  - d. Contract term
  - e. Expected useful life
- 1.94. Please provide EKPC's forecasted potential to obtain energy from PURPA qualified facilities over the IRP planning period. If no such forecasting attempt was made as part of this IRP exercise, please explain in full why not.
- 1.95. Refer to EKPC's acknowledgement, at page 56 of the 2022 IRP, "that market and fuel prices levels at the end of March 2022 are significantly higher than they were in the Fall 2021, when EKPC developed the price assumptions for this study. The bulk of the differences would impact the short term operations, but the market is expected to eventually turn back towards the price assumptions used in the study."
- a. Please define the time period contemplated by the phrase "short term operations" as used in the above-referenced statement.
  - b. Please define the time period contemplated by the phrase "eventually" as used in the above-referenced statement (e.g., number of days, weeks, months, or years).
  - c. Please explain in full detail EKPC's basis for expecting that the market will "eventually turn back towards the price assumptions used in the study." Please produce the documentation, analyses, and reports relied on by EKPC in forming this expectation.
  - d. In EKPC's estimation, what factors contributed to the market and fuel price levels observed at the end of March 2022? Please explain.
  - e. Has EKPC performed an analysis of risk exposure should high market or fuel prices continue? If so, please explain the methodology, inputs, and results, and provide associated workpapers. If not, why not?

- 1.96. Please list the currently effective coal supply contracts, including the following details for each: month/year of execution; annual delivery volumes; cost per ton; and term.
- 1.97. Please identify the month/year of EKPC's most recent RFP for coal supply contracts and summarize the responses received, including offered tonnage, delivered price per ton, and term.

Respectfully submitted,



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## CERTIFICATE OF SERVICE

In accordance with the Commission's July 22, 2021 Order in Case No. 2020-00085, *Electronic Emergency Docket Related to the Novel Coronavirus COVID-19*, this is to certify that the foregoing electronic filing was submitted to the Commission on June 30, 2022; that the documents in this electronic filing are a true representations of the materials prepared for the filing; and that the Commission has not excused any party from electronic filing procedures for this case at this time.

A handwritten signature in black ink, consisting of a large loop on the left, a smaller loop in the middle, and a long horizontal stroke extending to the right.

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Tom FitzGerald