

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

In the Matter of:

ELECTRONIC 2023 INTEGRATED RESOURCE)
PLAN OF BIG RIVERS ELECTRIC) CASE NO. 2023-00310
CORPORATION)

**INITIAL DATA REQUESTS OF JOINT INTERVENORS
KENTUCKIANS FOR THE COMMONWEALTH
AND KENTUCKY RESOURCES COUNCIL**

Tom FitzGerald
Ashley Wilmes
Byron L. Gary
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602
(502) 875-2428
FitzKRC@aol.com
Ashley@kyrc.org
Byron@kyrc.org

*Counsel for Joint Intervenors, Kentuckians
for the Commonwealth and Kentucky
Resources Council*

Dated: December 8, 2023

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. Unless otherwise specified in each individual interrogatory or request, the terms “you,” “your,” “Big Rivers,” or “Company” refer collectively to Big Rivers Electric Corporation, including any parent or affiliated companies, predecessors-in-interest,

officers, directors, employees, authorized agents, outside consultants or contractors, or other representatives who may have knowledge of the particular matter addressed.

11. “Joint Intervenors” means the Kentuckians For The Commonwealth and Kentucky Resources Council.

12. “Commission” or “PSC” means the Kentucky Public Service Commission, including its Commissioners, personnel, and offices.

13. Unless otherwise specified in each individual interrogatory or request, the term "IRP" means the integrated resource plan, as filed in this matter by Big Rivers Electric Corporation.

14. “C&I” means Commercial and Industrial.

15. “CCS” means Carbon Capture and Sequestration.

16. “CSAPR” means Cross State Air Pollution Rule.

17. “DG” means distributed generation.

18. “DSM” means Demand Side Management.

19. "EIA" means U.S. Energy Information Administration.

20. "EIR" means Energy Infrastructure Reinvestment.

21. “EV” means electric vehicle.

22. “FAC” means Fuel Adjustment Clause.

23. “ITC” means Investment Tax Credits.

24. “MISO” means Midcontinent Independent System Operator.

25. “NAAQS” means National Ambient Air Quality Standards.

26. “NEBs” means non-energy benefits.

27. “NewERA” means Empowering Rural America.

28. “NGCC” means natural gas combined cycle.

29. “NPV” means net present value.

30. "O&M" means Operation and Maintenance.
31. "PACE" means Powering Affordable Clean Energy.
32. "PTC" means Production Tax Credits.
33. "RFI" means Request for Information.
34. "RFP" means Request for Proposals.
35. "RUS" means Rural Utility Service.
36. "SAIDI" means System Average Interruption Duration Index.
37. "SAIFI" means System Average Interruption Frequency Index.
38. "SIP" means State Implementation Plan.
39. "TRC" means Total Resource Cost.
40. "UCAP" means Unforced Capacity.

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. Whenever the documents responsive to a discovery request consist of modeling files (including inputs or output) and/or workpapers, the files and workpapers should be provided in machine-readable electronic format (e.g., Microsoft Excel), with all formulas and cell references intact.
5. The answers provided should first restate the question asked and also identify the person(s) supplying the information.
6. 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.
7. Wherever the response to a request consists of a statement that the requested information is already available to Joint Intervenors, please provide a detailed citation to the document that contains the information. This citation shall include the title of the document, relevant page number(s), and, to the extent possible, paragraph number(s) and/or chart/table/figure number(s).
8. If you claim a privilege including, but not limited to, the attorney-client privilege or the work product doctrine, as grounds for not fully and completely responding to any discovery request, please describe the basis for your claim of privilege in sufficient detail so as to permit Joint Intervenors or the Commission to evaluate the validity of the claim. With respect to documents for which a privilege is claimed, please produce a

“privilege log” that identifies the author, recipient, date, and subject matter of the documents or interrogatory answers for which you are asserting a claim of privilege and any other information pertinent to the claim that would enable Joint Intervenors or the Commission to evaluate the validity of such claims.

9. 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.

10. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.

INITIAL DATA REQUESTS PROPOUNDED TO
BIG RIVERS ELECTRIC CORPORATION BY JOINT INTERVENORS

- 1.1. With regards to each modeling run carried out as part of this IRP, including Appendices:
 - a. Produce all modeling input and output files (in electronic machine readable, unprotected format with original formulas intact) for each run.
 - b. Produce any workbooks or workpapers, in electronic, machine readable, unprotected format with original formulas intact, used to develop or process inputs to the model.
 - c. Produce any workbooks or workpapers, in electronic, machine readable, unprotected format with original formulas intact, used to review or process outputs of each model run.

- 1.2. For each monthly billing period in calendar years 2021 and 2022, as well as the first and second quarters of 2023, please provide the following information for residential class customers:
 - a. Service charge (per month)
 - b. Energy charge (per kWh)
 - c. FAC factor (per kWh)
 - d. Actual average monthly usage (kWh)

- 1.3. Refer to page 7 of the IRP. With regards to the statement that the IRP “reflects the continuing, in-depth analysis required to ensure future demand is met with a reliable supply of affordable electricity”:
 - a. Identify and produce any analysis of the average energy burden (i.e. percent of household income that goes towards utility bills) that Big Rivers residential customers currently experience or would experience as a result of the resource decisions proposed in this IRP.
 - b. State whether reducing energy burdens for low-income customers was considered as part of this IRP process. If so, explain how. If not, explain why not.
 - c. Identify the following data for each monthly of 2022:
 - i. Number of customers who were sent a notice of potential disconnection of electric service due to non-payment.
 - ii. Number of customers who had their electric service disconnected due to non-payment.
 - iii. Number of customers with past due electric bills, and the average amount owed on such past due bills.
 - iv. Total arrearages for all Big Rivers customers.
 - v. Total late payment fees charged to Big Rivers customers.

- 1.4. Refer to pages 24-25 and Table 2.2.7(a) of the IRP. With regards to the RFIs for economic development projects discussed therein:
 - a. Identify the same data provided in Table 2.2.7(a) for each of the years 2015-2019.
 - b. Identify how many of the economic development projects that submitted RFIs in any of the years 2015 through 2023 have actually been implemented in the Big Rivers territory, and the total MW of the projects that have been implemented.
 - c. Produce any forecast or projection of the number and total MW of economic development projects that will be implemented in the Big Rivers territory in any of the years 2024 through 2042.

- 1.5. Refer to page 30 of the IRP. With regards to the minimum generation limits for Big Rivers' generating units:
 - a. Identify the current limit for each unit.
 - b. Identify the historical limit for each unit.
 - c. Identify when Big Rivers "significantly lower[ed] the historical minimum generation limit" on each unit.

- 1.6. Refer to page 33 of the IRP. With regards to Big Rivers' generation performance:
 - a. Confirm that the capacity of the Wilson plant was derated more than 200 MW from December 19, 2022 through Jan. 2, 2023, including during Winter Storm Elliot.
 - b. Confirm that the Wilson plant was tripped offline for 2.6 hours during Winter Storm Elliot due to wet/frozen coal issues.
 - c. Confirm that the Reid CT unit experienced two starting failures for a total of 8 hours during Winter Storm Elliot.
 - d. Identify by day and hour(s) each time since January 1, 2018 that Green Units 1 and/or 2 were on forced outage, unavailable, or derated due to inadequate fuel supply.
 - e. Identify by day and hour(s) each time since January 1, 2018 that the Reid CT unit was on forced outage, unavailable, or derated due to inadequate fuel supply.

- 1.7. Refer to Table 2.3(b) on page 34 of the IRP.
 - a. Identify the net capacity factor for each of the years 2018 through 2022 for each of the Wilson, Green, and Reid units.
 - b. Identify the net output factor for each of the years 2018 through 2022 for each

of the Wilson, Green, and Reid units.

- 1.8. Refer to page 35 of the IRP. For each of the Wilson, Green, and Reid generating units (or by plant if Big Rivers does not maintain unit-level data):
 - a. Explain the basis for the “expected retirement date” of each of the units identified therein, and produce any analysis, modeling input and output files, workpapers, or other documents supporting such dates.
 - b. Produce any profit and loss statement, revenue projection, net present value (“NPV”) revenue requirement, or other economic analysis of the unit completed since 2018, including any modeling input and output files, workpapers, or other documents used in carrying out such analysis.
 - c. Produce the most recent condition assessment for each unit.
 - d. Produce any analysis or assessment of the impact that retirement of each unit would have on resource adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability.
 - e. Identify any transmission grid upgrades or changes that would be needed to allow for the retirement of any of the units.

- 1.9. Refer to page 36 of the IRP.
 - a. Produce the 2022 All Source Request for Proposals (“RFP”) for generation resources.
 - b. Explain why Big Rivers issued an RFP for generation resources in 2022.
 - c. Produce all of the bids received in response to the 2022 RFP.
 - d. Produce any summary, analysis, or report regarding the bids received in response to the 2022 RFP.

- 1.10. For each of Wilson, Green, and Reid generating units, provide the following historical annual data by unit, or, if Big Rivers does not maintain unit-level data, by plant, from 2018 to present:
 - a. Fixed O&M cost
 - b. Non-fuel 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.
- n. Unforced capacity (“UCAP”)

1.11. For each of the Wilson, Green, and Reid generating units, provide the following projected annual data by unit, or, if Big Rivers does not maintain unit-level data, by plant, for the years 2023 through 2037:

- a. Fixed O&M cost
- b. Non-fuel 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
- n. Unforced capacity (“UCAP”)

1.12. Refer to page 56 of the IRP. With regards to the Powering Affordable Clean Energy (“PACE”) program:

- a. Identify and produce any analysis or evaluation that you carried out or reviewed of potential funding opportunities under the PACE program.
- b. Produce the referenced Letter of Interest and any supporting materials that Big Rivers submitted to the Rural Utilities Service (“RUS”).
- c. Explain why Big Rivers decided to include only the two referenced projects in its Letter of Interest, as opposed to additional and/or larger projects. Produce any supporting documentation for that decision.
- d. State whether Big Rivers has been invited to submit a full application under the PACE program.
 - i. If so, produce the invitation and any application that Big Rivers has submitted. If Big Rivers has not yet submitted the application, state by when it plans to do so.
 - ii. If not, state whether Big Rivers has been informed that it will not be invited to submit an application, or whether Big Rivers is still waiting for a response to its Letter of Interest.
- e. State whether Big Rivers would still proceed with the two projects proposed in the Letter of Interest if it does not receive PACE support for those projects. If not, explain why not.

- 1.13. Refer to pages 56-57 of the IRP. With regards to the Empowering Rural America (“NewERA”) program:
- a. Identify and produce any analysis or evaluation that you carried out or reviewed of potential funding opportunities under the NewERA program.
 - b. Describe the “project that will significantly reduce carbon emissions,” including what types of resources would be involved in the project, the estimated amount by which the project would reduce carbon emissions, the estimated cost of the project, the amount of NewERA funding Big Rivers is seeking for the project, and the anticipated timing of the project.
 - c. Produce the referenced Letter of Interest and any supporting materials that Big Rivers submitted to the Rural Utilities Service (“RUS”).
 - d. State whether Big Rivers has been invited to submit a full application under the NewERA program.
 - i. If so, produce the invitation and any application that Big Rivers has submitted. If Big Rivers has not yet submitted the application, state by when it plans to do so.
 - ii. If not, state whether Big Rivers has been informed that it will not be invited to submit an application, or whether Big Rivers is still waiting for a response to its Letter of Interest.
 - e. State whether Big Rivers would still proceed with the project proposed in the Letter of Interest if it does not receive NewERA support for those projects. If not, explain why not.
- 1.14. Has Big Rivers sought any financing for potential clean energy projects from the U.S. Department of Energy’s Energy Infrastructure Reinvestment (EIR) program¹?
- a. If so, identify the potential clean energy projects for which financing has been sought, and produce any Letter of Interest, application, or other documentation of such proposal.
 - b. If not, explain why not.
- 1.15. Has Big Rivers sought any financing or funding for potential clean energy projects from the U.S. Department of Agriculture’s Rural Energy for America Program?²
- a. If so, identify the potential clean energy projects for which financing has been sought, and produce any Letter of Interest, application, or other

¹ DOE, *ENERGY INFRASTRUCTURE REINVESTMENT*, <https://www.energy.gov/lpo/energy-infrastructure-reinvestment> (last visited December 4, 2023).

² USDA Rural Development, Rural Energy for America Program, <https://www.rd.usda.gov/programs-services/energy-programs/rural-energy-america-program-renewable-energy-systems-energy-efficiency-improvement-guaranteed-loans> (last visited December 4, 2023)

- documentation of such proposal.
- b. If not, explain why not.

1.16. Did Big Rivers' IRP process consider the availability of the Low-Income Communities Bonus Credit Program for solar and wind facilities located in low-income communities or developed as part of a qualified low-income residential building or economic benefit project.³ If so, how was that program considered? If not, explain why not.

1.17. Refer to pages A-17 to A-18 of Appendix A to the IRP. With regards to the electric vehicle ("EV") forecast set forth therein:

- a. Identify and produce the EIA Annual Energy Outlook regional projections from which the forecasted annual EV energy charging values are derived.
- b. Explain how the forecasted annual EV energy charging values were derived from the EIA Annual Energy Outlook regional projections, including any changes you made to the assumptions or results of the EIA projections.
- c. State whether any Inflation Reduction Act tax incentives were factored into the EV forecast. If so, explain how. If not, explain why not.
- d. State whether Big Rivers has evaluated incentive programs, creation of a public charging network, or other steps it could take to increase the adoption of electric vehicles in its territory.
 - i. If so, explain the results of such evaluation and produce any documentation of the same.
 - ii. If not, explain why not.

1.18. Refer to pages A-19 to A-20 of Appendix A to the IRP. With regards to the distributed generation ("DG") forecast set forth therein:

- a. Identify and produce the specific portions of the EIA Annual Energy Outlook from which the forecasted annual DG amounts are derived.
- b. Explain how the forecasted annual DG amounts were derived from the EIA Annual Energy Outlook, including any changes you made to the assumptions or results of the EIA forecast.
- c. State whether any Inflation Reduction Act tax incentives were factored into the DG forecast. If so, explain how. If not, explain why not.
- d. For each of the years 2018 through 2023, provide the following information for the Big Rivers rural system in total and for each of Big Rivers' member distribution companies. Provide data for all customer classes, DG technologies, and tariffs used (e.g. Net metering, SQF, LQF, etc.):

³ See e.g., Internal Revenue Service Notice 2023-17, *Initial Guidance Establishing Program to Allocate Environmental Justice Solar and Wind Capacity Limitation Under Section 48(e)* (Feb. 13, 2023), <https://www.irs.gov/pub/irs-drop/n-23-17.pdf>.

- i. the total number of DG customers.
 - ii. The total capacity (KW) of DG.
 - iii. The total energy (kwh) exported to Big Rivers by DG customers.
 - e. For each of the years 2023 through 2042, and for each of residential and commercial customers, identify the forecasted number and capacity (KW) of DG customers in the Big Rivers rural system, and explain the basis for that forecast.
 - f. State whether Big Rivers has evaluated any programs or other steps it could take to increase the number of DG customers in its rural system.
 - i. If so, explain the results of such evaluation and produce any documentation of the same.
 - ii. If not, explain why not.
 - g. Has Big Rivers prepared or reviewed any analysis of the potential grid resilience and reliability benefits of distributed solar generation in its territory? If so, produce that analysis. If not, explain why not.
 - h. Kenergy's Solar Net Metering and Alternative Energy webpage states that "Many of Kenergy's substations are becoming saturated with solar energy production and reaching their capacity limit."⁴
 - i. Explain the basis for this claim, and produce any analysis and data showing that many of Kenergy's substations are reaching their capacity limits, and that they are doing so because of solar energy production.
 - ii. State whether the capacity limits referenced here are the substations' rated capacity or some lower limit established by Kenergy and/or Big Rivers. If it is a lower limit, identify what percent of the rate capacity the limit is set at, and explain the reason for applying such lower limit.
 - iii. State whether Big Rivers is taking any steps to address the capacity limit issue to ensure that it does not restrict solar net metering growth. If so, explain what steps are being taken. If not, explain why not.
- 1.19. Refer to page A-32 of Appendix A to the IRP. With regards to the Large C&I Class projections:
- a. Identify the three new consumers projected to be added in 2024 and the projected energy sales to each.
 - b. Explain why your 2023 Load Forecast shows no changes to the number of consumers, use per consumer, or energy sales in the Large C&I Class from 2029 through 2042.
 - c. Has Big Rivers created or reviewed any forecast of the number of consumers, use per consumer, or energy sales in the Large C&I Class for any of the years 2029 through 2042?
 - i. If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such

⁴ <https://www.kenergycorp.com/alternative-energy/>

forecast.

ii. If not, explain why not.

1.20. Refer to pages A-33 and A-34 of Appendix A to the IRP. With regards to Direct Serve Class projections:

- a. Identify the one new consumer that you expected to add to the Direct Serve Class in each of 2023 and 2024.
- b. Explain why, starting in 2028 and then every fourth year thereafter, the use per consumer and energy sales for the Direct Serve Class increases 0.12% and then declines by 0.12% the very next year.
- c. Explain why your 2023 Load Forecast shows no changes to the number of consumers or, with the exception of the 0.12% issue referenced in subpart b, to the use per consumer and energy sales for the Direct Serve Class from 2025 through 2042.
- d. Has Big Rivers created or reviewed any forecast of the number of consumers, use per consumer, or energy sales in the Direct Serve Class for any of the years 2025 through 2042?
 - i. If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such forecast.
 - ii. If not, explain why not.

1.21. Refer to page A-34 of Appendix to the IRP. For each of the 17 Direct Serve consumers in 2023:

- a. Produce the current contracts for energy sales with each of the Direct Serve consumers.
- b. For each contract for sales to Direct Serve consumers, identify the amount of energy sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.
- c. For each Direct Serve consumer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of the current contract.
- d. Identify each Direct Serve consumer that has stated an intent not to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of their current contract.

1.22. Refer to pages A-43 and A-44 of Appendix A to the IRP. Identify the percentage of sales projected to be contributed by the Direct Serve class in each of the years 2024 through 2041.

- 1.23. Refer to page A-45 of Appendix A to the IRP. With regards to Non-Member Energy Sales:
- a. Identify and produce any analysis or calculation showing that the transactions with any or all of the Non-Member Energy customers have “derive(d) value for the Big Rivers Members” over any of the years 2018 through 2023, including any workpapers, modeling input and output files, or other documentation supporting the same.
 - b. Identify and produce any projection or forecast of the “value for the Big Rivers Members” that would be derived from Non-Member Energy customers in any of the years 2024 through 2042.
- 1.24. Refer to pages A-45 and A-46 of Appendix A to the IRP. With regards to Non-Member Energy Sales:
- a. Identify and produce any forecast or estimate of Non-Member Energy Sales (whether to current or potential future Non-Member Energy customers) in any of the years of 2030 through 2042.
 - b. Produce the current contracts for energy sales with each of the Non-Member Energy customers.
 - c. For each contract for Non-Member Energy Sales, identify the amount of energy sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.
 - d. For each Non-Member Energy Sales customer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of the current contract.
 - e. Identify each Non-Member Energy Sales customer that has stated an intent not to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of their current contract.
- 1.25. Refer to page A-49 of Appendix A to the IRP.
- a. Explain why your 2023 Load Forecast shows no changes to the coincident peak contribution of the Direct Serve class in every year from 2025 through 2042.
 - b. Has Big Rivers created or reviewed any forecast of the Direct Serve class coincident peak contribution for any of the years 2025 through 2042?
 - i. If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such forecast.
 - ii. If not, explain why not.
- 1.26. Refer to page A-50 of Appendix A to the IRP. With regards to Non-Member Capacity Sales:

- a. Identify and produce any forecast or estimate of Non-Member Capacity Sales (whether to current or potential future Non-Member Energy customers) in any of years of 2029 through 2042.
 - b. Produce the current contracts for capacity sales with each of the Non-Member Capacity customers.
 - c. For each contract for Non-Member Capacity Sales, identify the amount of capacity sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.
 - d. For each Non-Member Capacity Sales customer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for capacity sales beyond the expiration of the current contract.
 - e. Identify each Non-Member Capacity Sales customer that has stated an intent not to extend, renew, or otherwise continue contracting for capacity sales beyond the expiration of their current contract.
- 1.27. Refer to page A-51 of Appendix A to the IRP. Identify and produce any forecast or estimate of the non-coincident peak contribution of current or potential future Non-Member Sales customers in any of the years 2029 through 2042.
- 1.28. With respect to cryptocurrency facilities in Big Rivers territory:
- a. Identify all currently operating cryptocurrency facilities in Big Rivers territory by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and which consumer class they belong to.
 - b. Identify all proposed cryptocurrency facilities that you anticipate will begin operating in Big Rivers territory in the next three years by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and to which consumer class they would belong.
 - c. For each currently operating or proposed cryptocurrency facility identified in response to paragraphs (a) and (b), please explain in detail whether or how you have incorporated the facility into the load forecast for this IRP.
 - d. Identify the projected cryptocurrency capacity need (in MW) in Big Rivers territory for each of the years 2023 through 2042.
- 1.29. With respect to data centers in Big Rivers territory:
- a. Identify all currently operating data centers in Big Rivers territory by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and which consumer class they belong to.
 - b. Identify all proposed data centers that you anticipate will begin operating in Big Rivers territory in the next three years by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load

- factor, and to which consumer class they would belong.
- c. For each currently operating or proposed data center identified in response to paragraphs (a) and (b), please explain in detail whether or how you have incorporated the facility into the load forecast for this IRP.
 - d. Identify the projected data center capacity need (in MW) in Big Rivers territory for each of the years 2023 through 2042.
- 1.30. Refer to page E-3 of Appendix B to the IRP. For each of the Achievable, Economic, and Technical energy efficiency potential savings levels, identify:
- a. The annual spending for 2024 through 2033 needed to achieve each level of energy efficiency savings potential.
 - b. The Total Resource Cost (“TRC”) benefit-cost ratio for each level of energy efficiency savings potential.
- 1.31. For each of the energy efficiency and demand response programs evaluated in the Demand-Side Management Potential Study included as Appendix B to the IRP, answer the following requests:
- a. Explain in detail how avoided costs were determined for each cost benefit test used (e.g., Total Resource Cost, Utility Cost, Participant Cost, Rate Impact Measure)
 - b. Provide the values used for each element of the avoided cost categories listed below, identify 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. 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. Any other avoided cost values incorporated into cost-effectiveness analysis.

1.32. Refer to page 80 of the IRP, and page 83 of Big Rivers' 2020 IRP.

- a. Given that the current IRP demand-side management potential study found a TRC ratio of 3.1 for a \$1 million per year energy efficiency program, and the 2020 IRP found a TRC ratio of 2.5 to 2.7 for a \$2 million and \$1 million program, respectively, explain in detail why Big Rivers has not yet sought Commission approval for any new proposed DSM programs.
- b. State whether you anticipate seeking Commission approval for any new proposed energy efficiency programs in the next three years. If not, explain why not.

1.33. Refer to page 87 of the IRP, and page 88 of Big Rivers' 2020 IRP.

- a. Given that the current IRP found 13 demand response programs to have a TRC ratio higher than 1, and that the 2020 IRP found four demand response programs with a TRC ratio higher than 1, explain in detail why Big Rivers has not yet sought Commission approval for any new demand response programs.
- b. State whether you anticipate seeking Commission approval for any new proposed demand response programs in the next three years. If not, explain why not.

1.34. Refer to page 81 of the IRP. With regards to the DSM-14 Low-Income Weatherization Program-Pilot:

- a. Identify the level of activity in the Program in 2019, 2020, and 2021.
- b. Describe the steps that Big Rivers has taken since 2019 to promote and encourage participation in the Program.
- c. Identify the amount that Big Rivers has spent each year since 2019 to promote and encourage participation in the Program.
- d. State whether Big Rivers has analyzed why no activity in the Program has been seen since March 31, 2021. If so, explain the results of such analysis and produce any written documentation regarding such analysis. If not, explain why not.

1.35. Identify the currently effective coal supply contracts, including the following details for each: month/year of execution; annual delivery volumes; cost per ton; and term.

- 1.36. Identify the month/year of Big Rivers' most recent RFP for coal supply contracts and summarize the responses received, including offered tonnage, delivered price per ton, and term.

- 1.37. Refer to page 106 of the IRP. Produce the Big Rivers 2019-2033 Long-Term Financial Plan and any supporting workpapers and modeling input and output files, and identify the date that such Plan was created.

- 1.38. Refer to page 106 of the IRP. With regards to the IRP assumptions about Big Rivers' existing generation resources:
 - a. Explain why you neither evaluated the economics of any retirement date for the Wilson plant, nor allowed the model the option of selecting the retirement of Wilson plant, during any year of the planning period.
 - b. Explain why you evaluated only a single retirement date for the Green units during the planning period, rather than either evaluating multiple different retirement dates or allowing the model the option of selecting an economic retirement date.
 - c. Explain why you neither evaluated the economics of any retirement date for the Reid combustion turbine, nor allowed the model the option of selecting the retirement of Reid, during any year of the planning period.

- 1.39. Refer to pages 107-108 of the IRP. Identify the limits on the amount and duration of reliance on the MISO market for capacity included in your modeling, and explain the basis for such limits.

- 1.40. Refer to page 116 of the IRP. Produce the Big Rivers 2023-2037 Long-Term Financial Plan and any supporting workpapers and modeling input and output files, and identify the date that such Plan was created.

- 1.41. Refer to Table 7.1.4(e) on page 118 of the IRP. State whether the \$38.10/MWh "variable cost for Encompass model" for the Unbridled PPA includes any solar tax credits under the Inflation Reduction Act.
 - a. If so, identify in \$/MWh the amount of tax credit included.
 - b. If not, explain why not.

- 1.42. Refer to pages 119 and 145 of the IRP. Identify and produce the Energy Information Administration "public technology assessment" referenced therein.

- 1.43. With regards to the EnCompass expansion planning and production cost modeling discussed in Chapter 7 of IRP:
 - a. Explain how and at what value the Inflation Reduction Act's expanded and extended Investment Tax Credits ("ITC") and Production Tax Credits ("PTC") were factored into the project costs for solar, wind, and battery storage resources.
 - b. Explain each way in which the ITC and PTC for solar, wind, and battery storage were factored into Big Rivers' EnCompass modeling for this IRP.

- 1.44. Refer to page 125 of the IRP. With regards to the discussion of wind energy:
 - a. Explain in detail what steps Big Rivers has taken over the past five years to evaluate whether there are viable locations for wind energy in Kentucky.
 - b. Identify and produce any analysis or study that Big Rivers has carried out or reviewed of whether there are viable locations for wind energy in Kentucky.
 - c. Explain the "pricing basis risk between strong wind regionals and the Big Rivers service territory" and produce any analysis of that risk.
 - d. Produce the "rural Kentucky generation profile data" referenced therein, and explain how the production assumptions for wind that Big Rivers used are consistent with that data.

- 1.45. Refer to pages 125-26 of the IRP. With regards to the potential DSM program that was evaluated as part of the IRP:
 - a. Explain the basis for assuming a \$1 million (nominal) annual program budget for the potential DSM program.
 - b. Explain why you did not evaluate a potential DSM program with a higher annual budget, such as \$2 million or \$4 million per year.
 - c. Explain why you did not evaluate a DSM program reflecting the achievable potential identified in your DSM Potential Study.
 - d. Explain why you did not evaluate a DSM program reflecting the economic potential identified in your DSM Potential Study.

- 1.46. Refer to Tables 7.2.1(a) and (b) on pages 135-36 of the IRP.
 - a. Explain in detail the basis for the annual project capacity limit in the EnCompass modeling of 300 MW for 4-Hour Storage, and 200 MW for each of Solar PV and Wind, as opposed to higher limits for those resources.
 - b. Identify and produce any studies, analysis, or other documents supporting the annual project capacity limits referenced in response to subpart a above.
 - c. Explain in detail the basis for the cumulative project capacity limit in the EnCompass modeling of 600 MW for 4-Hour Storage, as opposed to a higher

limit.

- d. Identify and produce any studies, analysis, or other documents supporting the cumulative project capacity limit for 4-Hour Storage referenced above.

1.47. Refer to Tables 7.2.1(a) and (b) on pages 135-36 of the IRP. Confirm that the EnCompass model was allowed to select Big Rivers' \$1 million DSM program only in 2024, as opposed to in any later year.

1.48. State whether you allowed the EnCompass model to select an economic resource (i.e. a resource that would reduce the NPV cost of a portfolio) in a particular year even if there was not an energy or capacity need in that year. If not, explain why not.

1.49. Refer to Table 7.1.4(a) on page 114 of the IRP, and Table 7.2.1(a) on page 135 of the IRP.

- a. Explain why Table 7.1.4(a) identifies 2022 as the "First Available Year" for 4-Hour Li-Ion BESS in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for 4-hour storage in the EnCompass model until 2029.
- b. State whether, besides the PACE 4-hour storage project, any 4-hour storage resources could be selected in your EnCompass modeling before 2029.
 - i. If so, identify the years in which such 4-hour storage resources could be selected, and any limits on such resources before 2029.
 - ii. If not, explain why not.
- c. Explain why Table 7.1.4(a) identifies 2023 as the "First Available Year" for Solar PV resources in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for Solar PV in the EnCompass modeling until 2027.
- d. State whether any Solar PV resources could be selected in your EnCompass modeling before 2027.
 - i. If so, identify the years in which Solar PV resources could be selected, and any limits on the amount of such resources that could be selected, before 2029.
 - ii. If not, explain why not.
- e. Explain why Table 7.1.4(a) identifies 2024 as the "First Available Year" for Wind resources in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for Wind in the EnCompass modeling until 2028.
- f. State whether any Wind resources could be selected in your EnCompass modeling before 2028.
 - i. If so, identify the years in which Wind resources could be selected, and

any limits on the amount of such resources that could be selected, before 2028.

ii. If not, explain why not.

1.50. Refer to page 145 of the IRP. Identify and produce the “EIA’s public technology assessment” and the “EPA estimates for carbon capture technologies” referenced therein.

1.51. Refer to pages 145-46 of the IRP. With regards to the discussion therein of Carbon Capture and Sequestration (“CCS”):

- a. State whether Big Rivers has identified secure geological storage site(s) to which its captured carbon emissions could be transported for permanent sequestration. If so:
 - i. Identify such site(s) and produce any analysis of their suitability for permanent sequestration.
 - ii. State whether sufficient CO₂ pipeline infrastructure exists to enable transport of the captured CO₂ to the site(s) and, if not, the estimated cost of building such infrastructure.
- b. Identify the basis for the assumption that the carbon capture equipment would capture 90% of CO₂ emissions from Wilson or the new gas combined cycle plant, and produce any analyses supporting that capture rate.
- c. Identify the outage rate that you assumed for the Wilson plant, the gas combined cycle plant, and the carbon capture technology in your modeling of the ACR Portfolio.

1.52. Refer to Table 7.4.1(c) on page 155 of the IRP. With regards to the annual levels of coal generation projected by the EnCompass modeling:

- a. Explain why coal generation falls by more than 60% from 2024 to 2026 (from 3,093 GWh to 1,140 GWh).
- b. Explain why annual coal generation remains below 1,000 GWhs in every year from 2027 through 2031.
- c. Explain why coal generation more than doubles from 2031 to 2033 (from 981 GWh to 2,136 GWh) and then remains above 2,000 GWh per year through 2042.

1.53. Compare Table 7.1.6(a) on page 132 to Table 7.4.1(c) on page 155 of the IRP.

- a. Confirm that you are forecasting between 4,700 and 4,900 GWh of total energy needs per year for every year of 2030 through 2042. If not confirmed, explain your answer.
- b. Confirm that your EnCompass modeling projects total generation of more

- than 6,500 GWh in 2030, increasing to more than 8,000 GWh per year for every year from 2034 through 2042. If not confirmed, explain your answer.
- c. Explain why you are planning to generate 1,000s of GWh more energy in each of the years 2030 through 2042 than needed to serve Big Rivers total forecasted energy needs.
 - d. Identify and produce any analysis of the costs, benefits, and/or risks to ratepayers of Big Rivers planning to generate 1,000s of GWh more energy in each of the years 2030 through 2042 than needed to serve total forecasted energy needs.
- 1.54. Refer to pages 156-158 of the IRP. Identify the annual generation by fuel type for each of the years 2023 through 2042 from the EnCompass modeling of the Alternative Portfolio.
- 1.55. Refer to page 181 of the IRP. With regards to Big Rivers' plan to "[c]ontinue MISO Generator Interconnection Agreement process to ensure cost and ability to interconnect a NGCC unit":
- a. Identify when Big Rivers initiated the referenced Interconnection Agreement process.
 - b. Explain the current status and estimated remaining timeline of such process.
 - c. Produce any generation interconnection application, including attachments, that Big Rivers has submitted to MISO for an NGCC unit.
- 1.56. Has Big Rivers engaged stakeholders, including residential customers, in the development of this IRP?
- a. If so, explain how and provide copies of all materials concerning the IRP shared with stakeholders, and any comments submitted to Big Rivers by stakeholders during the IRP development process.
 - b. If not, explain why not.
- 1.57. Please identify the current compliance status of the Wilson facility with current Effluent Limitations Guidelines for steam electric power plants, as updated by EPA in 2020.
- a. Please describe in detail any compliance projects that have been proposed to and/or approved by the Commission, with reference to any cases in which such projects were proposed and/or approved, and state the current status of such projects and expected timing of their completion.
 - b. Has the Company assessed how much additional cost would be required to comply with EPA's proposed supplemental Effluent Limitations Guidelines rule, which was published in the Federal Register on March 29, 2023 (88 Fed.

Reg. 18,824)? If yes, please describe in detail what additional projects would be required to comply with the requirements of that proposed rule (if finalized as proposed) and the current cost estimate for those projects. If not, please explain in detail why not.

- c. The proposed supplemental rule (if finalized as proposed) would change the technology basis for FGD wastewater requirements and require zero discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.
- d. The proposed supplemental rule (if finalized as proposed) would change the technology basis for bottom ash transport water requirements and require zero discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.
- e. The proposed supplemental rule (if finalized as proposed) would require additional wastewater treatment for combustion residual leachate prior to discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.

1.58. Please refer to pages 95-98 of the IRP, dealing with contributions to nonattainment of National Ambient Air Quality Standards (NAAQS).

- a. Please explain the assertion at page 97 that the Revised CSAPR Rule Update relating to contributions to violations of the 2008 ozone NAAQS involved denials of SIP applications that are currently subject to litigation in several Federal Courts of Appeal, and cite which cases are being referred to.
- b. Please explain any evaluation Big Rivers has undertaken of the June, 2023 Good Neighbor Plan for the 2015 ozone NAAQS, 88 FR 36654 ("Good Neighbor Plan"), including how Big Rivers would comply with the final emissions allowances if the stay of the disapproval of the SIP related to the 2015 ozone NAAQS were lifted or similar reductions were otherwise required.
- c. Produce any analysis Big Rivers has conducted related to the Good Neighbor Plan's impact on dispatch or operation of any of its facilities.
- d. Identify and produce any analysis that Big Rivers has carried out or reviewed of the impact on residential and industrial customers' rates of implementing the Good Neighbor Plan.

1.59. Please refer to pages 99–100 of the IRP.

- a. Please identify any "legacy ponds" or "CCR Management Units" – as those

- terms are defined in the May 18, 2023 proposed rule – that are present at Coleman, Green, Reid/HMP&L, or Wilson generating stations.
- b. Please identify the “various industry trade groups” that are referenced in the IRP and please explain how the Company is “involved with [those groups] in litigation challenging the proposed rule.”
 - c. Please identify the “litigation challenging the proposed rule” that the Company is “involved with” and specify whether any ratepayer funds are being used to support any such litigation. If ratepayer funds are being used to support any such litigation, please explain in detail and identify the amount of funds that the Company is contributing to such litigation and the Company’s justification for doing so.

1.60. Refer to pages 93 – 95 of the IRP, which discusses EPA’s “Proposed GHG Rule”:

- a. Produce any comments that Big Rivers submitted to EPA regarding the Proposed GHG Rule.
- b. With regards to your reference on page 94 of the IRP to the “exceptionally high costs of implementation” of the Proposed GHG Rule, identify and produce any analysis that Big Rivers has carried out or reviewed of the cost of implementing the Rule if it were finalized in its proposed form.
- c. Identify and produce any analysis that Big Rivers has carried out or reviewed of the impact on residential and industrial customers’ rates of implementing the Proposed GHG Rule if it were to be finalized in its proposed form.
- d. Identify and produce any evaluation that Big Rivers has carried out or reviewed of the cost and/or technological feasibility of bringing the Wilson plant into compliance with the BSER standards set forth in the Proposed GHG Rule.
- e. Identify and produce any evaluation that Big Rivers has carried out or reviewed of the cost and/or technological feasibility of bringing the approximately 635 MW natural gas combined cycle plant included in the IRP Base Case with the BSER standards set forth in the Proposed GHG Rule.

1.61. Refer to Big Rivers’ 2022 Annual Report,⁵ which states at page 11 that: “This past year brought new successes as the Big Rivers System Average Interruption Duration Index (SAIDI) hit 3.02 for the entire transmission system, equating to about three minutes of Member outage time in 2022. The Meade County RECC region SAIDI score was even more remarkable, with zero outage minutes for the year.”

- a. Explain how that statement is consistent with the 2022 data reported in the Energy Information Administration’s Annual Electric Power Industry Report,

⁵ http://www.bigrivers.com/wp-content/uploads/2023/05/2022_BigRivers_AnnualReport.pdf

Form EIA-861,⁶ which shows 2022 SAIDI values of 385.11 minutes for Kenergy Corp., 145.345 minutes for Jackson Purchase Energy Corporation, and 142.306 minutes for Meade County Rural E.C.C.⁷

- b. Identify the projected SAIDI and System Average Interruption Frequency Index (SAIFI) values for each of Kenergy, Jackson Purchase, and Meade County Rural E.C.C. for each of the years 2023 through 2038, and produce any analysis supporting such projections.
- 1.62. Refer to page 12 of Big Rivers' 2022 Annual Report. Identify the projected values for each of the following for each of the years 2023 through 2038 for which a projection exists:
- a. Long-term debt
 - b. Line of credit
 - c. Margins for Interest Ratio (MFIR)
 - d. Times Interest Earned Ratio (TIER)
 - e. Debt Service Coverage Ratio (DSCR)
- 1.63. Please refer to page 11 of Big Rivers' 2022 Annual Report, where the Company states that it received "1,848 MW or 15 Crypto Currency Project REFI's in 2022."
- a. Please produce copies of the "15 Crypto Currency Project REFI's" that are referenced in the 2022 Annual Report.
 - b. For each of the 15 referenced projects, please identify:
 - i. The name of the company proposing the cryptocurrency facility;
 - ii. The proposed location of the facility;
 - iii. The proposed capacity need of the facility;
 - iv. The proposed firm capacity need of the facility;
 - v. The anticipated load factor of the facility; and
 - vi. The current status of the project, i.e., was the proposed facility constructed, is it still under development, are there any ongoing discussions between the project proponent and the Company, or is the project no longer under active consideration.
 - c. Has Big Rivers received any "REFI's" for cryptocurrency projects in 2023? If yes, please produce copies of the REFI's and identify for each project the information requested above in paragraph (b).
- 1.64. How many Big Rivers customers primarily heat their homes using electric

⁶ <https://www.eia.gov/electricity/data/eia861/>

⁷ The referenced values can be found in the Reliability_2022.xlsx file available at <https://www.eia.gov/electricity/data/eia861/zip/f8612022.zip> (see lines 361, 378, and 471 on the Reliability_States tab).

heating? Please provide any available analyses or workpapers to support your answer.

- a. Of the customers primarily heating their home with electric heating, please further specify what type of electric heating is used by the customer, such as boiler, furnace, heat pump, electric resistance, unit heater, or infrared. Please provide any available analyses or workpapers that support your answer.
- b. Has the Company considered specifically targeting energy efficiency measures toward customers who primarily heat their homes with electric resistance heating?
 - i. If yes, please explain how the Company has considered this and provide copies of any workpapers or other documents that support your answer.
 - ii. If not, please explain in detail why not.

1.65. How many Big Rivers customers live in manufactured housing? Please provide any available analyses or workpapers to support your answer.

- a. Has the Company considered specifically targeting energy efficiency measures toward customers who live in manufactured housing?
 - i. If yes, please explain how the Company has considered this and provide copies of any workpapers or other documents that support your answer.
 - ii. If not, please explain in detail why not.

1.66. Refer to page 166 of the IRP. With regards to MISO's coordinated short-term and long-term transmission planning processes:

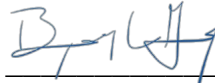
- a. Describe in detail in what ways Big Rivers has participated in the referenced MISO transmission planning processes over the past five years.
- b. Identify and produce any comments that Big Rivers has submitted in the referenced MISO transmission planning processes over the past five years.
- c. Identify and produce any studies or analyses that Big Rivers has carried out over the past five years as part of its participation in the referenced MISO transmission planning processes.

1.67. Refer to pages 166-167 of the IRP.

- a. Identify and produce Big Rivers most recent assessment of "its transmission system's ability to transfer power into and out of Big Rivers' local balancing area."
- b. Identify and produce any studies or other analyses supporting the statement that "a simultaneous net import capability of approximately 900 MW is expected."
- c. State whether Big Rivers has evaluated steps that it could take to increase its

net import capability. If so, describe the results, and produce any documentation of, such evaluation. If not, please explain why not.

Respectfully submitted,

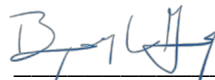


Tom FitzGerald
Ashley Wilmes
Byron L. Gary
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602
(502) 875-2428
FitzKRC@aol.com
Ashley@kyrc.org
Byron@kyrc.org

*Counsel for Joint Intervenors,
Kentuckians for the Commonwealth and
Kentucky Resources Council*

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 electronic filing was submitted to the Commission on December 8, 2023; 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.



Byron L. Gary