

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

In the Matter of:

ELECTRONIC 2024 INTEGRATED)
RESOURCE PLAN OF DUKE ENERGY) CASE NO. 2024-00197
KENTUCKY, INC.)

**TENDERED INITIAL REQUESTS FOR INFORMATION OF KENTUCKY
SOLAR ENERGY SOCIETY, KENTUCKIANS FOR THE
COMMONWEALTH, AND KENTUCKY RESOURCES COUNCIL TO
DUKE ENERGY KENTUCKY**

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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. "Company", "Duke Energy", or "Duke", means Duke Energy Kentucky, Inc., and/or any of its officers, directors, employees or agents who may have knowledge of the particular matter addressed, and affiliated companies including Duke Energy Corporation.
12. "DEOK" means Duke Energy of Ohio and Kentucky.
13. "Joint Intervenors," or "Joint Movants" means Kentucky Solar Energy Society, Kentuckians for the Commonwealth, and Kentucky Resources Council who have moved for the status of full intervention as joint intervenors in this matter.
14. Unless otherwise specified in each individual request the term "tariff" means the tariff as filed in this matter by Company.
15. "IRP" means integrated resource plan.
16. "2024 IRP" means the Kentucky 2024 Duke Energy Integrated Resource Plan.
17. "NAAQS" means national ambient air quality standards.
18. "PM" means particulate matter
19. "PM_{2.5}" means particles with diameters generally less than or equal to 2.5 µm, also known as fine particulate matter.
20. "2024 PM_{2.5} NAAQS" means the EPA *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, 89 Fed. Reg. 16,202 (Mar. 06, 2024).
21. "GNP" means good neighbor plan.
22. "2015 Ozone GNP" means the EPA *Federal "Good Neighbor Plan" ("GNP") for the 2015 Ozone National Ambient Air Quality Standards*, 88 Fed. Reg. 36,654 (Jun. 05, 2023).
23. "Legacy CCR Rule" means the EPA *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments rule*, 89 Fed. Reg. 38,950 (May 08, 2024).
24. "Section 111 Update" means the EPA *New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas*

Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798 (May 09, 2024).

25. "CAA" means Clean Air Act.
26. "CO₂" means carbon dioxide.
27. "CCS" means carbon capture and storage.
28. "EIR" means the Energy Infrastructure Reinvestment Program.
29. "ELCC" means effective load carrying capacity.
30. "GRIP" means the Grid Resilience and Innovation Partnerships Program.
31. "IRA" means the Inflation Reduction Act of 2022.
32. "ITC" means investment tax credits.
33. "O&M" means operation & maintenance.
34. "PTC" means production tax credits.
35. "PV" means solar photovoltaic.
36. "PVRR" means present value revenue requirement.
37. "TFP" means the Transmission Facilitation Program.
38. "SMR" means small modular reactor.
39. "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. 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. 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. 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.
10. The interrogatories are to be answered under oath by the witness(es) responsible for the answer.

TENDERED INITIAL DATA REQUESTS PROPOUNDED
TO DUKE ENERGY KENTUCKY BY JOINT
INTERVENORS

Joint Movants for Joint Intervention hereby tender the following initial requests for information to the Company:

- 1.1. Please provide the workpapers underlying all figures and tables in the 2024 IRP, in native file format with formulas intact.
- 1.2. For each East Bend and Woodsdale generating unit, provide the following historical annual data by unit, or, if Duke 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”)
- 1.3. For each East Bend and Woodsdale generating unit, provide the following historical annual data by unit, or, if Duke 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”)
- 1.4. Regarding East Bend Unit 2, please answer the following:
- a. Please describe the gas supply capacity currently available to East Bend 2.
 - b. Please explain whether existing gas supply infrastructure available to East Bend 2 would be adequate to meet the unit’s full requirements if operated as a dual fuel unit.
 - i. If additional gas supply infrastructure would be necessary to operate East Bend 2 as a dual fuel unit, please describe the necessary infrastructure, provide cost estimates, and explain in full how the estimated costs were included in the IRP modeling.
 - c. Please explain whether existing gas supply infrastructure available to East Bend 2 would be adequate to meet the unit’s full requirements if fully converted to gas-fired operation.
 - i. If additional gas supply infrastructure would be necessary to operate East Bend 2 fully on gas, please describe the necessary infrastructure, provide cost estimates, and explain in full how the estimated costs were included in the IRP modeling.
- 1.5. According to Form EIA-861 “Advanced Meters” (2022), over 99% of Duke Energy Kentucky customers have advanced metering infrastructure. Please answer the following requests:
- a. Is the information in Form EIA-861 accurate? If more accurate or recent details on advanced meters is available, please provide that information.
 - b. Has the Company implemented conservation voltage reduction? If so, please explain the efforts undertaken.
 - c. Please explain how the Company’s investment in advanced meter improves the efficiency or quality of service to customers.
- 1.6. Please refer to the Kentucky 2024 Duke Energy Integrated Resource Plan (“2024 IRP”) at p. 2, and the statement that “Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company) is a wholly-owned subsidiary of Duke Energy Ohio, Inc. (Duke Energy Ohio),” and the statement at p. 10 that “Electric energy and peak demand forecasts are prepared each year as part of the planning process by a staff that is shared among Duke Energy Corp. (Duke Energy) affiliated utilities.” Please explain the relationship between Duke Energy Kentucky, Duke Energy Ohio, Duke Energy Ohio/Kentucky (DEOK) and Duke Energy.
- 1.7. Please refer to the 2024 IRP at p. 3, particularly that, as compared to the 2021 IRP, “the 2024 IRP includes updated policies at both the state and federal level including: . . . Removal of a CO2 tax on plant emissions as a likely future policy primarily due to the inclusion of the IRA and EPA CAA Section 111 provisions.”
- a. Please list additional justifications for removing a CO2 tax on plant emissions in the 2024 IRP, if any.
 - b. Please explain why a CO2 tax on plant emissions was not included in scenarios that assumed EPA’s CAA Section 111 provisions would be stayed or eventually repealed.

- c. Please explain how scenarios that assumed EPA’s CAA Section 111 provisions would be stayed or appealed accounts for regulatory risk of carbon emitting generating sources.
- 1.8. Please refer to the 2024 IRP at pp. 8-9, and the statement that “Future regulation cannot be forecasted in a quantitative manner; therefore, the current regulatory environment is assumed to persist throughout the planning period. The one major exception to that assumption is regarding a stay of, future changes to, or repeal of the EPA CAA Section 111 Update, which, given its potential impact, is addressed in several sensitivities under a ‘without EPA CAA Section 111 Update’ scenario,” and answer the following requests:
- a. What makes the EPA CAA Section 111 Update different from other regulations in regard to quantification?
 - b. Refer also to p. 11, “Environmental Regulations Included in the IRP.” Did the Company consider the impacts of any other environmental regulations than those listed here?
 - c. Did the Company consider the impact of the Reconsideration of the National Ambient Air Quality Standards (“NAAQS”) for Particulate Matter (“PM”) (“2024 PM_{2.5} NAAQS”)?
 - i. If so, how? If not, why not?
 - ii. Please refer to the statement at p. 130 that “[a]s to Duke Energy Kentucky, a likely impact of the more stringent PM NAAQS would be increased permitting requirements for projects that are located in a nonattainment area. Under the Clean Air Act, a new major source of air pollutants or a major modification to an existing source must obtain preconstruction permits, that demonstrate through air quality modeling that the source will not cause or contribute to a NAAQS violation.” Did the Company assess the additional cost for any of its portfolios of additional preconstruction permitting? If so, provide the results of any such assessment. If not, why not?
 - d. Did the Company consider the impact of the Federal “Good Neighbor Plan” (“GNP”) for the 2015 Ozone National Ambient Air Quality Standards (“2015 Ozone GNP”)? If so, how? If not, why not?
 - e. Did the Company consider the impact of the Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments rule (“Legacy CCR Rule”)? If so, how? If not, why not?
- 1.9. Please refer to the 2024 IRP at p. 9, particularly that “[t]he Company included supply and demand-side resource for consideration if they are technically feasible and commercially available in its service territory during the planning window,” and answer the following requests:
- a. Confirm that the Company considers CCS “technically feasible and commercially available in its service territory.” If anything but confirmed, please explain.
 - b. Confirm that the Company considers CCS of emissions from a combined

- cycle gas plant “technically feasible and commercially available in its service territory.” If anything but confirmed, please explain.
- c. Confirm that the Company considers SMRs “technically feasible and commercially available in its service territory.” If anything but confirmed, please explain.
 - d. Please refer also to the statement at p. 12 that “[t]he first step in the screening process for supply-side resources is a technical screening to eliminate from consideration those technologies that are not technically or commercially available during the planning window. Technologies excluded from consideration on these grounds include solar steam augmentation, fuel cells, supercritical CO2 Brayton cycle, and liquid air energy storage.” Produce any analysis, study, or other references relied upon in determining that the technologies listed are not technically or commercially available during the planning window.
 - e. Please refer also to the statement at p. 12 that “[a]lso excluded from further consideration are technologies that are not feasible or available in the Duke Energy Kentucky service territory. These include geothermal, offshore wind, pumped storage hydropower, and compressed air energy storage.” Please produce any analysis, study, or other reference relied upon in determining that the technologies listed are not feasible or available in the Duke Energy Kentucky service territory.
 - f. Confirm whether all resources outside the Duke Energy Kentucky service territory were excluded from consideration.
- 1.10. Please refer to the 2024 IRP at p. 9, particularly that “[t]he primary criteria for evaluating each portfolio is affordability using PVRR as the metric, CO2 reduction and level of market purchases.”
 - a. Please explain why CO2 reduction was selected as a primary criteria for evaluating portfolios.
 - b. Please explain why “level of market purchases” was selected as a primary criteria for evaluating portfolios.
 - 1.11. Please confirm that, as a member of PJM, and excluding the energy generated from solar resources connected on the distribution level, the Company sells all the energy generated from its units in PJM’s energy market. If anything but confirmed, please explain.
 - 1.12. Please confirm that, as a member of PJM, and excluding the energy supplied from solar resources connected on the distribution level, the Company buys all the energy needed to serve customer load from PJM’s energy market. If anything but confirmed, please explain.
 - 1.13. Please refer to the 2024 IRP at p. 12, including the statement that “for rapidly developing technologies (e.g., solar photovoltaic (PV) and battery storage), the Company blended the AEO forecast factors with additional third-party capital cost projections.”

- a. In addition to PV and battery storage, please list each other resource technology that Duke applied a blended capital cost projection for in the modeling.
 - b. Please provide the referenced third-party capital cost projections.
 - c. Please describe the Company's methodology for "blending" AEO forecast factors and third-party capital cost projections.
 - d. Has the Company analyzed or caused to be analyzed the historical accuracy of AEO forecast factors for PV or battery storage? If so, please provide each such analysis.
 - e. Is the Company aware of any analysis evaluating the historical accuracy of AEO forecast factors for PV, battery storage, or resources generally? If so, please identify each such analysis.
- 1.14. Please refer to the statement at p. 14 of the 2024 IRP that "Annual US coal consumption has fallen over 30% in the last decade in response to coal plant retirements and relatively low natural gas prices." Does the Company anticipate that coal supply will decline, remain steady, or increase over the forecast period?
- 1.15. Please refer to the 2024 IRP at p. 16-25, Section 3.B. Power Prices, and answer the following requests:
- a. Please provide the hourly energy price outputs for each of the six generation expansion plan scenarios (listed in Table 3.1) in excel format, if possible.
 - b. At p. 16, the IRP states, "generic unit characteristics and reserve margin requirements are consistent across expansion plans for each of the operating regions." Please explain the meaning of "operating regions" as used in this statement.
 - c. At p. 16, the IRP states, "[e]xisting generating units were allowed to economically retire in each scenario." For each expansion plan scenario, please identify the generating units retired by the model and the year selected for economic retirement.
 - d. Were the hourly energy prices modeled in the generation expansion plan scenarios used in the resource modeling described in Section 6 of the IRP? If so, please identify which energy price forecast was used in each modeling exercise summarized in Section 6.
 - e. Were the base, high, and low fuel forecasts used in the generation expansion plan scenarios also used in the resource modeling described in Section 6 of the IRP? If so, please explain in full.
 - f. Compare figure 3.6 at p. 19 with figures 3.4, 3.8, 3.10, 3.12, and 3.14 and explain the difference in 2025-2050 projections. Compare also with figure 3.5 and confirm whether the graph appears to show growth in capacity, not generation.
- 1.16. Please refer to Section 3.D., Inflation Reduction Act Assumptions.
- a. What IRA benefits aside from the Production Tax Credits (PTC) and Investment Tax Credits (ITC) did the Company evaluate?
 - b. What IRA benefits has the Company applied for?
 - c. Has the Company evaluated the Grid Resilience and Innovation Partnerships

- (GRIP) Program?
- d. Has the Company evaluated the Energy Infrastructure Reinvestment (EIR) Program?
 - e. Has the Company evaluated the Transmission Facilitation Program (TFP)?
 - f. Please provide any evaluation, documentation, communication, letter of interest, or application related to the Company's engagement with any IRA programs.
 - g. If the Company has not evaluated any other IRA programs explain why not.
- 1.17. Please refer to the 2024 IRP at p. 28, and the statement that "Energy community bonuses are based on siting projects on retired coal generation sites or closed mined sites, brownfield sites or statistical area categories with historical employment in fossil areas and high unemployment. It was assumed that 25% of standalone solar, 25% of solar plus storage and 25% of batteries would be located in energy communities and that 100% of SMRs would be located in energy communities." Answer the following requests:
- a. What portion of the Duke Energy Kentucky service territory qualifies as an energy community?
 - b. What is the basis for the assumption that 25% of standalone solar would be located in energy communities?
 - c. What is the basis for the assumption that 25% of solar plus storage would be located in energy communities?
 - d. What is the basis for the assumption that 25% of batteries would be located in energy communities?
 - e. What is the basis for the assumption that 100% of SMRs would be located in energy communities?
- 1.18. Please refer to the 2024 IRP at p. 28, and the statement that "From review of studies from Rhodium, REPEAT, Resources for the Future, Energy Innovation and other recent IRPs, Duke Energy has determined that the 75% reduction from 2022 levels will not be reached until the mid-2040s at the earliest." Please provide the referenced studies and other recent IRPs, or publicly-accessible links to each.
- 1.19. Please refer to the IRP at p. 28, including the statement that Duke "assumed that 25% of standalone solar, 25% of solar plus storage, and 25% of batteries would be located in energy communities and that 100% of SMRs would be located in energy communities."
- a. Please explain how this 25% assumption was applied in the modeling (e.g., are their particular solar resource options with cost assumptions that include the energy community adder and other solar resource options without the energy community adder).
 - b. Has Duke mapped or otherwise analyzed the sites in the DEOK PJM load zone that would likely qualify as energy communities? If so, please provide any such maps or analyses.
 - c. Please explain why a battery storage would be more or less likely to be sited in an energy community than a SMR.

- d. Please explain why a solar resource would be more or less likely to be sited in an energy community than a SMR.
- 1.20. Please refer to the 2024 IRP at p. 30, and the statement that “Executing on these compliance pathways will require updates to Kentucky statutes.” Answer the following requests:
- a. Please explain what updates to Kentucky statutes the Company is referring to.
 - b. Explain what updates to Kentucky statutes the Company believes will be required.
 - c. Explain how the Company intends to comply if statutes are not amended.
- 1.21. Please refer to Table 3.3 at p. 31 and answer the following requests:
- a. Provide the source for the PVRR, Discount Rate, and Inflation Rate, along with any underlying calculations or workpapers.
 - b. With regard to the note, please state what the requirements do include.
- 1.22. Please refer to Table 3.3 at IRP p. 31. Please explain the costs included in Table 3.3 (e.g., capital costs of resource conversion and additions in the preferred portfolio, fuel supply costs, energy market revenues (or losses)).
- 1.23. Please refer to the IRP at p. 37, including the following statement:

For the 2025/2026 Delivery Year, PJM determined that the members of the Gas Combined Cycle Dual Fuel Class are so distinct from one another that a single ELCC Class Rating would fail to capture their physical characteristics. This is due to the Gas Combined Cycle Dual Fuel Class having very few members (less than 10 units) following the dual fuel attestation process for the 2025/26 BRA and there being a large disparity in the observed historical performance during hours of risk across the members of this class. Therefore, no ELCC Class Rating will be determined for the Gas Combined Cycle Dual Fuel Class for the 2025/2026 Delivery Year.

- a. To the Company’s knowledge, what is the resource-specific ELCC value for each of the referenced 10 units.
 - b. As understood by the Company, please explain the meaning and significance of “performance during hours of risk” in PJM.
- 1.24. Please refer to the 2024 IRP at p. 39 and explain what is meant by “zonal pricing risk.” Is the zonal pricing risk quantifiable? How or why not?
- 1.25. Please refer to the IRP at p. 39, including that statement that “[w]ithin the modeling execution assumption, opportunities to mitigate the above risks were identified, such as capping the generating size of an asset or considering shorter term power purchase agreements.”
- a. Please explain the phrase “modeling execution assumption.”
 - b. Please explain how capping the generating size of an asset would mitigate

- zonal pricing risk exposure.
- c. Please confirm that the amount of zonal pricing risk exposure would be influenced by a given resource's ELCC, e.g., one 250 MW resource with an ELCC of 70% will have more zonal pricing risk exposure than a 250 MW resource with an ELCC of 15%.
 - d. Where purchase power agreement available to EnCompass as a selectable resource addition? If please, please describe how in material detail.
- 1.26. Please refer to the 2024 IRP at p. 38, and provide the referenced "publicly available Front-End Engineering and Design (FEED) studies as well as published studies," or publicly-accessible links to the same.
 - 1.27. Please refer to the 2024 IRP at p. 39 and the statement that "Based on the timelines to site and develop a wind resource, it was determined that a wind resource located in Duke Energy Kentucky's service territory was not feasible in the near term." Explain the timeline to site and develop a wind resource and define "near term" as used in this context.
 - 1.28. Please refer to the IRP at p. 43, including the statement that "Portfolios were optimized in EnCompass for each East Bend strategy . . .", and listing of three optimized portfolios intended to comply with the EPA CAA Section 111 Update.
 - a. In the "East Bend DFO Conversion by 2030" portfolio, was the selection of DFO by 2030 a fixed input by the Company or was DFO by 2030 selected by the resource optimization model? Please explain.
 - b. In the "East Bend Natural Gas Conversion by 2030" portfolio, was the selection of natural gas conversion by 2030 a fixed input by the Company or was natural gas conversion by 2030 selected by the resource optimization model? Please explain.
 - c. In the "East Bend Retirement by 2032" portfolio, was the selection of retirement by 2032 a fixed input by the Company or was retirement by 2032 selected by the resource optimization model? Please explain.
 - 1.29. Please refer to the IRP at p. 54, including the statement that "market purchases also vary between portfolios prior to operational changes at East Bend due to random outages that are modeled in EnCompass." How does EnCompass model random outages for East Bend prior to operational changes as compared to after operational changes? Please explain.
 - 1.30. Please refer to the 2024 IRP at pp. 43-60, Section 6 Model Results & Sensitivity Analysis, and answer the following requests.
 - a. Please identify, for each scenario, the first year in which the East Bend 2 unit was allowed to economically retire in the model.
 - b. Please identify, in each optimized portfolio and each alternate portfolio, the first year in which each Woodsdale CT unit was allowed to economically retire in the model.
 - 1.31. Please refer to the 2024 IRP at Table 6.4, p. 44, and specifically the values for

the “East Bend CC w/CCS (1x1) for years 2039 and 2040 and confirm whether these values are accurate.

- 1.32. Please refer to Section 6.C., Alternate Portfolios, and specifically the “With EPA CAA Section 111 Update Scenario” options 4 and 5 as well as Tables 6.7, 6.8, 6.10, and 6.11, and confirm how the “East Bend CC (1x1)” allowed to enter service in either 2032 or 2038, or the “East Bend CT” allowed to enter service in 2038 would comply with EPA’s CAA Section 111 Update.
- 1.33. Please refer to the 2024 IRP at p. 56, and explain how “the CC ... would reduce customer exposure to fluctuating market prices compared to the natural gas conversion case....”
- 1.34. Please refer to the 2024 IRP at p. 62, “Inflation Impacts on New Generation” and explain how the results of the recent PJM 2025/2026 Base Residual Auction impact the analysis in the 2024 IRP.
- 1.35. Please refer to the 2024 IRP at p. 63 and the statement that “[t]he requirements of SB4 and SB349 do not apply to the Company’s plan to convert East Bend to DFO,” and answer the following requests:
 - a. Explain the Company’s rationale that the requirements of SB4 and SB349 do not apply to the conversion of East Bend to DFO.
 - b. Is it the Company’s understanding that the requirements of SB4 and SB349 would or would not apply to the conversion of East Bend to run exclusively on natural gas? Please explain.
 - c. Is it the Company’s understanding that the requirements of SB4 and SB349 would or would not apply to the replacement of the current East Bend Unit 2 with a combined cycle unit. Please explain.
- 1.36. Please refer to the 2024 IRP at p. 64, and specifically the statement that “There currently are no transmission system projects planned or in-progress affecting any Duke Energy Kentucky transmission facilities that are intended to provide or are associated with the provision of additional resources.” Please answer the following requests:
 - a. Please confirm no transmission upgrades are planned or needed to accommodate the additional solar added in the preferred portfolio in 2029, 2031, 2033, 2035, 2037, and 2039. Why or why not?
 - b. Please confirm no transmission upgrades are planned or needed for the additional capacity of the East Bend CC (1x1) planned for 2039 in the preferred portfolio. Why or why not?
 - c. Explain the transmission upgrades that would be needed under each of the optimized and alternative portfolios in Section 6.
- 1.37. Please refer to the IRP at p. 67, including the statement: “Internal forecasts are utilized for electricity prices, weather conditions, and customer adoption of rooftop solar and electric vehicles.”
 - a. Please provide the Company’s forecast for customer adoption of rooftop

- solar.
- b. Please provide the Company's forecast for customer adoption of electric vehicles.
 - c. Please provide the Company's forecast for customer adoption of behind-the-meter battery storage.
- 1.38. Please refer to the 2024 IRP at pp. 90-92 and provide the units for Tables B.15-B.27.
- 1.39. Please refer to the 2024 IRP at p. 102, particularly the statement that "[t]he Company may vary the incentive by type of equipment and differences in efficiency to induce customers to purchase greater levels of efficiency at the minimum necessary incentive amount."
- a. As part of this IRP, did the Company evaluate the potential impact of higher incentives in its Residential Smart Saver® program on participation, estimated savings, or cost-effectiveness?
 - i. If so, please provide that evaluation, including supporting documentation and workpapers in native file format with formulas intact.
 - ii. If not, please explain why not.
- 1.40. Please list the neighborhoods identified for the Neighborhood Energy Saver Program during Fiscal Year 2022-2023.
- 1.41. Please list the neighborhoods served through the Neighborhood Energy Saver Program during Fiscal Year 2022-2023.
- 1.42. Please refer to the 2024 IRP at p. 127, regarding the updates to the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units (aka "Mercury and Air Toxics Standards" or "MATS" Rule), and the 2024 Update ("MATS Update"). Answer the following requests:
- a. Refer to the statement that "East Bend demonstrates compliance using the filterable particulate surrogate." Provide hourly filterable PM emissions from East Bend for the past three years in native machine-readable electronic format (e.g., CSV or Microsoft Excel), with all formulas and cell references intact.
 - b. Refer to the statement that "[t]o ensure that it can reliably meet the lower filterable particulate standard prior to July 8, 2027, Duke Energy Kentucky is evaluating capital projects that will be required on the electrostatic precipitators (ESP) and flue gas desulfurization (FGD) units. Initial cost estimates for these projects have been included in the IRP modeling efforts to ensure that compliance with the MATS regulation is factored into long-term planning decisions." Provide the cost estimates, separated out for each option being considered.

- 1.43. Please refer to the 2024 IRP at pp. 127-128, regarding “Interstate Transport – Ozone “Good Neighbor” Plans,” and provide the following information:
- a. Ozone season emissions of nitrogen oxides (NO_x) from each of the Woodsdale and East Bend units, at the unit level.
 - b. Allowances used, purchased, sold, and traded for each of the Woodsdale and East Bend units over the past five years under the 2015 Ozone GNP or its predecessor programs.
- 1.44. Please refer to the 2024 IRP, Appendix F, at p. 144, noting that “[a]ll portfolios were developed with the inclusion of EE and DR forecasts,” and answer the following requests:
- a. Were all portfolios developed with the same EE and DR forecasts? Please explain.
 - b. Please explain in full the modeling performed as part of this IRP to evaluate the impact of higher levels of energy savings from Duke’s EE and DR programs.
 - c. Were savings from energy efficiency programs offered to the resource expansion model as a selectable resource option? If so, please explain in full the approach used to make program savings available as a selectable resource option. If not, please explain why not.
- 1.45. Please refer to Duke’s June 21, 2024 Motion for Confidential Treatment,¹ para. 3, including the statement that the “Capital cost data contained in Figure 4.1 was derived from data obtained from Guidehouse and Burns & McDonnell, as well as, confidential pricing for resources that were bid into a recent RFP that was issued in another Duke Energy Corporation (Duke Energy Corp) utility subsidiary’s jurisdiction.”
- a. Please provide the referenced “recent RFP.”
 - b. Please provide the pricing for resources that were bid into the referenced RFP.
 - c. Please explain in full Duke Energy Kentucky’s reasons for assuming the pricing for resources that were bid into the referenced RFP would be representative of pricing for resources in Duke Energy Kentucky’s service territory.
 - d. Please provide the referenced data obtained from Guidehouse.
 - e. Please provide the referenced data obtained from Burns & McDonnell.
- 1.46. Please refer to the 2024 IRP at p. 143, particularly:

Response: Duke Energy Kentucky offers several time of use (TOU) based rates to non-residential customers to assist them with managing their bills including Rate RTP, Rate DT, Rate TT, and Rider LM. In addition, the Company currently has a pending TOU residential rate option in Case No. 2022-00372; Rate RS-TOU-

¹ https://psc.ky.gov/pscecf/2024-00197/debbie.gates%40duke-energy.com/06212024125232/Motion_for_Confidential_Treatment_.pdf

CPP. However, these TOU rates are not offered through the Company's DSM portfolio of programs. They are either mandatory or optional rates customers can consider to help manage their bill.

- a. Please confirm that the Company did not evaluate alternative TOU based rates or adjustments to existing TOU based rates as part of this IRP. If anything but confirmed, please explain.
- b. Please confirm that the Company did not evaluate new or expanded demand-side management program options as part of this IRP. If anything but confirmed, please explain.

1.47. Please refer to the IRP at p. 144, particularly:

Duke Energy Kentucky should evaluate low-income DSM programs in other jurisdictions and analyze whether such programs would be effective in Duke Energy Kentucky's service territory.

Response: The Company monitors programs in other jurisdictions and requests changes to the Kentucky programs as deemed necessary.

- a. Please list the programs that the Company is monitoring.
- b. Please explain in full the evaluation of low-income DSM programs undertaken by the Company since its last IRP, including producing studies or reports documenting such evaluation(s), if any.

1.48. For each monthly billing period in calendar years 2021, 2022, and 2023, as well as the first half of 2024, 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)

1.49. Identify and produce any analysis of the energy burden (i.e., percent of household income that goes toward utility bills) that the Company's residential customers currently experience or would experience as a result of the resource decisions proposed in this IRP.

1.50. Please provide the following data for each month of 2023

- a. Number of customers who were sent a notice of potential disconnection of electric service due to non-payment.
- b. Number of customers who had their electric service disconnected due to non-payment.
- c. Number of customers with past due electric bills, and the average amount

- owed on such past due bills.
- d. Total arrearages for all customers.
 - e. Total late payment fees charged to customers.
- 1.51. Regarding the option to convert East Bend to dual fuel operation, please answer the following requests:
- a. Please identify and produce any analysis in the Company's possession of the costs to convert East Bend 2 to dual fuel operation.
 - b. Please identify and produce any analysis in the Company's possession of the expected operating characteristics (or range thereof) of East Bend post-conversion.
- 1.52. Regarding the option to convert East Bend to operate entirely on gas, please answer the following requests:
- a. Please identify and produce any analysis in the Company's possession of the costs to convert East Bend 2 to gas-only operation.
 - b. Please identify and produce any analysis in the Company's possession of the expected operating characteristics (or range thereof) of East Bend as a gas-only unit.
- 1.53. Is Duke Energy Kentucky aware of any new large load customers considering locating in the Company's service territory? If so, please describe the potential customers including their energy service needs.
- 1.54. With respect to cryptocurrency facilities in the Company's territory, if any, please answer the following requests:
- a. Identify all currently operating cryptocurrency facilities 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 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) for the Company's territory for each of the years 2025 through 2040.
- 1.55. Please 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.

1.56. In the Company’s estimation, how many residential customers rely on electric heating? Please provide any available analyses or workpapers to support your answer.

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 electronic filing was submitted to the Commission on August 14, 2024; that the documents in this electronic filing are a true representation 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.

