

DEFINITIONS

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” the “Company,” or “Duke,” refers to Duke Energy Kentucky, Inc., and its affiliates, directors, officers, employees, consultants, attorneys, and authorized agents.

“And” and “or” shall be construed either conjunctively or disjunctively as required by the context to bring within the scope of these interrogatories and requests for production of documents any information which might be deemed outside their scope by another construction.

“Any” means all, each and every example of the requested information.

“Communication” means any transmission or exchange of information between two or more persons, whether orally or in writing, and includes, without limitation, any conversation or discussion by means of letter, telephone, note, memorandum, telegraph, telex, telecopy, cable, email, or any other electronic or other medium.

“Control” means, without limitation, that a document is deemed to be in your control if you have the right to secure the document or a copy thereof from another person or public or private entity having actual possession thereof. If a document is responsive to a request, but is not in your possession or custody, identify the person with possession or custody. If any document was in your possession or subject to your control, and is no longer, state what disposition was made of it, by whom, the date on which such disposition was made, and why such disposition was made.

“Document” refers to written matter of any kind, regardless of its form, and to information recorded on any storage medium, whether in electrical, optical or electromagnetic form, and capable of reduction to writing by the use of computer hardware and software, and includes all copies, drafts, proofs, both originals and copies either (1) in the possession, custody

or control of the Company regardless of where located, or (2) produced or generated by, known to or seen by the Company, but now in their possession, custody or control, regardless of where located whether or still in existence. Such “documents” shall include, but are not limited to, applications, permits, monitoring reports, computer printouts, contracts, leases, agreements, papers, photographs, tape recordings, transcripts, letters or other forms of correspondence, folders or similar containers, programs, telex, TWX and other teletype communications, memoranda, reports, studies, summaries, minutes, minute books, circulars, notes (whether typewritten, handwritten or otherwise), agenda, bulletins, notices, announcements, instructions, charts, tables, manuals, brochures, magazines, pamphlets, lists, logs, telegrams, drawings, sketches, plans, specifications, diagrams, drafts, books and records, formal records, notebooks, diaries, registers, analyses, projections, email correspondence or communications and other data compilations from which information can be obtained (including matter used in data processing) or translated, and any other printed, written, recorded, stenographic, computer-generated, computer-stored, or electronically stored matter, however and by whomever produced, prepared, reproduced, disseminated or made. For purposes of the production of “documents,” the term shall include copies of all documents being produced, to the extent the copies are not identical to the original, thus requiring the production of copies that contain any markings, additions or deletions that make them different in any way from the original.

“Identify” means:

- a. With respect to a person, to state the person’s name, address and business relationship (e.g., “employee”) vis-à-vis the Company;
- b. With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, its date, its author, and to

identify its custodian. If the information or document identified is recorded in electrical, optical or electromagnetic form, identification includes a description of the computer hardware or software required to reduce it to readable form.

“Person” means, without limitation, every natural person, corporate entity, partnership, association (formal or otherwise), joint venture, unit operation, cooperative, municipality, commission, governmental body or agency.

“Relating to” or “concerning” means and includes pertaining to, referring to, or having as a subject matter, directly or indirectly, expressly or implied, the subject matter of the specific request.

“Workpapers” are defined as original, electronic, machine-readable, unlocked, in native format, and with formulae and links intact.

INSTRUCTIONS

1. The Definitions, Instructions, and Claim of Privilege set out in this Request for Information apply to these questions.
2. In answering these questions, furnish all information that is available to you, including information in the possession of your agents, employees, and representatives, all others from whom you may freely obtain it, and your attorneys and their investigators.
3. Please answer each question based upon your knowledge, information, or belief, and any answer that is based upon information or belief should state that it is given on that basis.
4. If you have possession, custody, or control of the originals of these documents requested, please produce the originals or a complete copy of the originals and all copies that are

different in any way from the original, whether by interlineation, receipt stamp, or notation.

5. If you do not have possession, custody, or control of the originals of the documents requested, please produce copies of the documents, however made, in your possession, custody, or control. If any document requested is not in your possession or subject to your control, please explain why not, and give the present location and custodian of any copy or summary of the document.
6. If any question appears confusing, please request clarification from the undersigned counsel.
7. In providing your responses, please start each response on a separate page and type, at the top of the page, the question that is being answered.
8. As part of the response to each question, please state, at the bottom of the answer, the name and job position of each person who participated in any way, other than providing clerical assistance, in the preparing of the answer. If the question has sub-parts, please identify the person or persons by sub-part. Please also state the name of the witness in this docket who will sponsor the answer to the question and who can vouch for the truth of the answer. If the question has sub-parts, please identify the witness or witnesses by sub-part.
9. Rather than waiting to provide all of the responses at the same time, please provide individual responses as each becomes available.
10. Wherever the response to a request for information consists of a statement that the requested information is already available to Sierra Club, please provide a detailed citation to the document that contains the information. The citation shall include the title

of the document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart(s)/table(s)/figure number(s).

11. In the event that any document referred to in response to any request for information has been destroyed, specify the date and the manner of such destruction, the reason for such destruction, the person authorizing the destruction and the custodian of the document at the time of its destruction.
12. These questions are continuing in nature. If there is a change in circumstances or facts or if you receive or generate additional information that changes your answer between the time of your original response and the time of the hearings, then you should submit, under oath, a supplemental response to your earlier answer.
13. If you consider any question to be unduly burdensome, or if the response would require the production of a voluminous amount of material, please call the undersigned counsel as soon as possible in order to discuss the situation and to try to resolve the problem. Likewise, if you object to any of the questions on the grounds that the question seeks confidential information, or on any other grounds, please call the undersigned counsel as soon as possible.
14. If the response to any question is voluminous, please provide separately an index to the materials contained in the response.
15. If the information requested is included in previously furnished exhibits, workpapers, or responses to other discovery inquiries or otherwise, in hard copy or electronic format, please furnish specific references thereto, including Bates Stamp page citations and detailed cross-references.

16. Data should be provided in native electronic format including active EXCEL workbooks and all linked workbooks, with all formulas, cell references, links, etc., intact, functioning, and complete for all tables, figures, and attachments in the testimony.
17. To the extent that a question asks for the production of copyrighted material, it is sufficient to provide a listing of such material, indicating the title, publisher, author, edition, and page references relied on or otherwise relevant to the question.
18. Sierra Club reserves the right to serve supplemental, revised, or additional information requests as permitted in this proceeding.

PRIVILEGE

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 request for information or request for production, describe the basis for your claim of privilege in sufficient detail so as to permit meaningful evaluation of the validity of the claim. With respect to documents for which a privilege is claimed, 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 likewise enable evaluation of the validity of such claims.

INFORMATION REQUESTS

- 1.1 To the extent not already provided, please provide all confidential responses to Requests for Information issued by Duke.
- 1.2 To the extent not already provided, please provide any redacted documents included in the Company's initial filing and direct testimonies in non-redacted, electronic versions (machine readable, unprotected, with formulas intact).
- 1.3 Please produce all workpapers, in electronic spreadsheet format with formulas intact, supporting each of the statements, testimonies, exhibits, and attachments included in the Company's initial filing and direct testimonies.
- 1.4 For East Bend Unit 2, please provide the following historical annual data, 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")
- 1.5 For East Bend Unit 2, please provide the following projected annual data, for the years 2025 through 2046, or the latest year available if not available through 2046:
 - 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”)

1.6 Please provide the annual revenue requirements and present value revenue requirement (PVRR) for all portfolios and scenarios modeled.

1.7 Please refer to the Direct Testimony of Chad M. Donner, at page 8, and answer the following requests:

- a. Please provide the 2023 Request for Proposal (RFP) documents and responsive bids.
- b. If the Company has issued an RFP for the MEL product since 2023, please identify each such RFP and provide RFP documents and responsive bids for each such RFP.
- c. Please provide details of the evaluation that Duke conducted about “the possibility of mixing standard high calcium quicklime and magnesium hydroxide”
- d. The Direct Testimony of J. Michael Geers, page 12, line 20, suggests that actual procurement and mixing occurred. Did this evaluation entail actual mixing of these components or was the evaluation limited to a paper study? Please provide any documents, results, reports, etc. pertaining to these studies.

- 1.8 Please explain how Duke’s modeling in support of this CPCN application incorporates the EPA’s updated Clean Air Act Section 111 rules, if at all.
- 1.9 If East Bend Unit 2 were converted to dual fuel operation, would the proposed conversion project still be necessary? Please explain why or why not in full, including providing supporting analyses and workpapers, if any.
- 1.10 If East Bend Unit 2 were converted to dual fuel operation:
 - a. How would that impact the usage of quicklime? If quicklime usage would be reduced, how much would it be reduced by?
 - b. If quicklime usage would be reduced, how much would there be in savings because of reduced quicklime usage?
- 1.11 If East Bend Unit 2 were converted to operate fully on natural gas, would the proposed conversion project still be necessary? Please explain why or why not in full, including providing supporting analyses and workpapers, if any.
- 1.12 Please confirm that the Company did not evaluate the retirement and replacement of East Bend Unit 2 among the alternatives considered. If anything but confirmed, please explain.
- 1.13 Please confirm that Duke’s 2021 IRP modeling found that, in scenarios with carbon regulation and a base or low gas rate, East Bend Unit 2’s economically optimal retirement date was 2027. If anything but confirmed, please explain.
- 1.14 Please confirm that Duke’s 2024 IRP modeling did not evaluate East Bend Unit 2 retirement dates earlier than 2029. If anything but confirmed, please explain.
- 1.15 Please confirm that Duke’s 2024 IRP modeling did not include the capital costs of the proposed conversion project. If anything but confirmed, please explain.
- 1.16 Please explain how Duke’s modeling in support of this CPCN application incorporates the EPA’s Good Neighbor Rule, if at all.
- 1.17 Has Duke conducted any analysis of the potential costs and timing for such costs at East Bend to comply with EPA’s Good Neighbor Plan? If so, please provide all documents reflecting such analyses. If not, why not?
- 1.18 Confirm that Kentucky is part of the Group 3 Trading Program under EPA’s Update to the Cross-State Air Pollution Rule (“CSAPR”). If not confirmed, please explain which Trading Group to which Kentucky belongs.

- 1.19 Please provide the total number of NOx credit purchases under CSAPR and cost by year for East Bend from 2017 to present.
- 1.20 Does Duke have a forecast for NOx credit costs under EPA's Good Neighbor Plan? If yes, please provide all forecasts through 2046. If not, why?
- 1.21 Please explain how Duke's modeling in support of this CPCN application incorporates the EPA's updated Effluent Limitation Guidelines ("ELG") Rule, if at all.
- 1.22 Has Duke conducted any analysis of the compliance costs at East Bend to comply with EPA's ELG Rule at East Bend?
- a. If so, please provide all documents reflecting such analyses. If not, why not?
 - b. Identify the total cost of the projects the Company intends to undertake or has undertaken at East Bend to comply with the ELG Rule.
 - c. State the year these costs have been or will be incurred.
 - d. Please identify and describe each itemized capital expenditure required to complete the ELG Rule compliance project.
 - e. Could any of those ELG Rule expenditures be avoided by making a commitment to cease burning coal under the ELG Rule's alternative closure provisions? If so, please identify each specific avoidable cost.
 - f. Please provide all evaluations of the technical or engineering compliance options for the ELG Rule for East Bend.
 - g. Produce all evaluation(s) that the Company performed to determine that incurring any avoidable ELG Rule costs at East Bend is in customers' best interest (i.e., present value of retrofit versus retirement analyses). For any such evaluation, provide the following data:
 - i. All workpapers, with formulas intact.
 - ii. Provide a list of all capital expenditures associated with ELG Rule compliance included in each modeled scenario and provide the cost of each.
 - iii. PJM Energy price forecasts (with and without CO₂ price)
 - iv. PJM Capacity price forecasts (with and without CO₂ price)

- v. CO₂ price forecasts
- vi. Coal price (\$/MMBtu)
- vii. Gas price (\$/MMBtu)
- viii. Heat rate (Btu)
- ix. Capital expenditures (\$)
- x. Variable Operation and Maintenance (\$/MWh)
- xi. Fixed Operation and Maintenance (\$/MW)
- xii. For each replacement resource available to the model, provide each of the following inputs for each resource at the highest level of granularity used in conducting the retrofit analysis:
 - 1. Replacement resource options
 - 2. Replacement resource size (MW)
 - 3. Year replacement resource is available (year)
 - 4. Cost of replacement resource option (\$/MW)
 - 5. Annual capacity factor
 - 6. Year of transmission upgrade (if required)
 - 7. Cost of transmission upgrade (if required)

1.23 Please explain how Duke’s modeling in support of this CPCN application incorporates the EPA’s Coal Combustion Residual (“CCR”) rule, if at all.

1.24 Has Duke conducted any analysis of the compliance costs at East Bend to comply with EPA’s CCR Rule at East Bend?

- a. If so, please provide all documents reflecting such analyses. If not, why not?
- b. Identify the total cost of the projects the Company intends to undertake or has undertaken at East Bend to comply with the CCR Rule.
- c. State the year these costs have been or will be incurred.

- d. Please identify and describe each itemized capital expenditure required to complete the CCR Rule compliance project.
 - e. State whether any of those costs are included in Duke's test year, and if so, identify the specific costs included.
- 1.25 Please explain how Duke's modeling in support of this CPCN application incorporates the EPA's updated Mercury Air Toxics Standards ("MATS") rule, if at all.
- 1.26 Has Duke conducted any analysis of the potential costs and timing for such costs at East Bend to comply with EPA's MATS rule? If so, please provide all documents reflecting such analyses. If not, why not?
- 1.27 Please explain how Duke's modeling in support of this CPCN application incorporates possible Regional Haze compliance costs, if at all.
- 1.28 Has Duke conducted any analysis of the potential compliance costs at East Bend to comply with EPA's Regional Haze Rule for the second planning period, 40 C.F.R. § 51.308? If so, please provide all documents reflecting such analyses. If not, why not?
- 1.29 Please provide the following for Duke Kentucky, with supporting workpapers (in electronic, machine-readable format):
- a. Annual peak load since 2015 (or earliest available).
 - b. Annual PJM capacity reserve requirement since 2015 (or earliest available).
 - c. Annual sales since 2015 (or earliest available).
 - d. Annual generation since 2015 (or earliest available).
 - e. Annual off-system energy sales in GWhs since 2015 (or earliest available).
 - f. Annual off-system energy sales revenues in dollars since 2015 (or earliest available).
- 1.30 For East Bend, please provide the following:
- a. Historical capital expenditures since 2010.
 - b. Projected capital expenditures through 2036.

- c. Provide a specific accounting of all projects and capital expenditures already scheduled or planned at East Bend 2 over the next ten years.
 - d. For each capital expenditure involving more than \$1 million, please provide all analyses of the present value of those investments versus retirement or replacement. If the Company did not perform any such analysis, why not?
- 1.31 Please provide the Company's three most-recent commodity and power market price forecasts. Indicate the date of each forecast.
- 1.32 Please provide total energy and ancillary service market revenues for East Bend, for the period 2019–2024.
- 1.33 Please provide total projected energy and ancillary service market revenues for East Bend, for the period 2025–2046.
- 1.34 Please provide unredacted, in native format with all formulae intact, all analyses or assessments that study the value of continued operation (e.g., all retirement studies, unit condition assessments, or deactivation assessments) conducted since 2015, for East Bend Generating Station, including, but not limited to, all studies, presentations, reports, or other assessments conducted to determine how to comply with any existing, impending, or potential environmental regulation.
- 1.35 For each retirement study or unit condition assessment in response to Sierra Club 1.34 above:
- a. State which modeling software was used to conduct the analysis.
 - b. State the date that the analysis was performed.
 - c. State whether the units were modeled with an economic (market) or self-commitment (must run) status for each year of the analysis.
 - d. State the date of each forecast or projection used in the analysis.
 - e. State the regulation or rationale behind each retirement date(s) studied.
 - f. Provide all underlying workbooks with formulas intact that were used to develop model input assumptions.
 - g. Identify all transmission grid updates or changes that would be needed to allow for the retirement of East Bend.

- h. Produce all analyses or assessments of the impact that retirement of each unit would have on capacity adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability.
- i. Provide each of the following inputs for each modeled scenario:
 - i. Heat rate (Btu);
 - ii. Projected Ongoing Capital expenditures (\$);
 - iii. Variable Operation and Maintenance (\$/MWh);
 - iv. Fixed Operation and Maintenance (\$/MW);
 - v. Environmental compliance capital expenditures;
 - vi. All transmission upgrade costs assumed, if any (\$);
 - vii. PJM energy price forecasts (with and without CO2 price);
 - viii. PJM capacity price forecasts (with and without CO2 price);
 - ix. CO2 price forecasts;
 - x. Coal price (\$/MMBtu); and
 - xi. Gas price (\$/MMBtu)

1.36 Please refer to the Direct Testimony of Witness Donner, page 7, lines 3-7.

- a. Please provide the total timeline needed for the conversion to be completed.
- b. Please identify which critical components have the estimated 52-54 week lead time and specify the lead time for each such component.
- c. For each critical component, please explain where the component is manufactured.

1.37 Please refer to the Direct Testimony of Witness Donner, page 7, lines 11-12, where the total estimated cost of construction is reported at \$125.8 million. Please provide the annual revenue requirements for this project over the proposed recovery period.

- 1.38 Please refer to the Direct Testimony of Witness Donner, page 9.
- a. Please provide an unredacted version of the table presented in between lines 2 and 3 of the testimony.
 - b. Please explain how Duke developed the values under the “Future Projections” for years 2025-2029 as shown in the table.
 - c. Please provide the source of the lime and limestone costs.
 - d. Please explain the intended meaning of “materially” as used on line 19.
- 1.39 Please refer to the Direct Testimony of Witness Verderame, page 6, lines 2-6, where it states that “The expenses associated with lime reagent, stabilization additives and disposal of the waste sludge produced by the process result in very high WFGD operating costs which adversely affect the competitiveness of the East Bend Station in today’s power markets.” Please provide the annual WFGD operating costs for the East Bend Station in the most-recent five year period available.
- 1.40 Please refer to the Direct Testimony of Witness Verderame, page 7, lines 6-7, where it states “The Company reached an interim agreement, but at more than double the price of the prior contract.”
- a. Please state the term of the interim agreement that the Company reached with the supplier.
 - b. Before the interim agreement was reached, how often was the Company contracting with this particular supplier? (*i.e.*, were contracts entered into for one year, five years, etc.)
 - c. Please explain how long the Company has been contracting with this supplier.
- 1.41 Please refer to the Direct Testimony of Witness Verderame, page 7, lines 12-13. Please explain the period(s) of time contemplated by the phrase “long-term contract,” and to the extent that the Company and the supplier discussed particular term lengths, please identify each specific term length discussed.
- 1.42 Please refer to the Direct Testimony of Witness Verderame, page 8, lines 1-3, which states, “As the capacity factor of East Bend 2 deteriorates, customers will be more exposed to purchased power, while continuing to pay for East Bend to sit idle.” Please provide the monthly off-system sales and purchases Duke Energy Kentucky has made since 2019.

- 1.43 Please refer to the Direct Testimony of Witness Verderame, page 9, lines 3-6, where it states that “Duke Energy Kentucky has been examining the possibility of a change to the MEL WFGD process for some time. However, given the cost of the investment, its complexity, and the accessibility of lime reagent, it previously did not make clear economic sense for customers.”
- a. Please explain when Duke Energy Kentucky first started evaluating the possibility of a change to the MEL WFGD process.
 - b. Please provide the estimated cost of converting to the MEL WFGD process at the time that Duke Energy Kentucky first began evaluating the possibility of a change to the MEL WFGD process.
- 1.44 Please refer to the Direct Testimony of Witness Verderame, page 9, lines 10-11, which states, “It is only in the recent years that the MEL reagent costs have climbed exponentially, and supply became a concern.”
- a. Please provide the MEL reagent costs for the past ten years. Please provide these broken out by commodity and transportation costs.
 - b. Please explain when Duke Energy Kentucky was first made aware that supply was a concern.
- 1.45 Please refer to the Company’s CPCN Application, Exhibit 4, AECOM’s Preliminary Engineering Report, at page 5 of 78. Please state approximately when “Duke Energy approached AECOM to assess the technical feasibility of converting the FGD system”
- 1.46 Please refer to the Direct Testimony of Witness Verderame, page 9, referencing an RFP solicitation. Please provide the date when the RFP was released and the date upon which Duke Energy Kentucky received responses to the RFP.
- 1.47 Please refer to the Direct Testimony of Witness Verderame, page 13, lines 16-19, where it states, “Finally, as discussed below and not included in the \$166.1 million impact above, the project saves \$6.1 million in fuel and purchase power costs, \$18.6 million in reagent costs, and \$3 million in additional non-native off-system sales margin on average per year.”
- a. Please explain how the fuel and purchase power costs, reagent costs, and additional non-native off-system sales margin were calculated.
 - b. Please explain the difference between the \$3 million in additional non-native off-system sales margin and the energy market impact of \$15.8 million per year referenced on page 13, lines 5-6 of Witness Verderame’s testimony.

- 1.48 Please refer to the Direct Testimony of Witness Verderame, page 14, lines 5-7, where it states, “Stochastic production cost modeling shows that conversion to a limestone reagent process is economic in most future scenarios with reduced variable operational costs of ~\$12.03/MWh reducing dispatch cost”
- a. Please confirm if the stochastic production cost modeling was performed using the EnCompass software. If the EnCompass software was not used, please provide the name of the software used.
 - b. Please provide, in machine readable format, the hourly market price forecasts modeled for each scenario.
 - c. Please provide the modeling period for the stochastic production cost modeling.
 - d. Please provide the modeling input and output files, in machine readable format, used to perform the stochastic production cost modeling.
 - e. Please explain what modeling inputs were modeled with stochastic inputs.
 - f. Please explain how the stochastic inputs were developed.
 - g. Please explain which scenarios are included in the “conversion to a limestone reagent process is economic in most future scenarios”.
 - h. Please provide the scenarios in which the conversion to a limestone reagent process is not economic.
 - i. Please provide the off-system sales and purchases for the scenarios evaluated in the stochastic production cost modeling.
- 1.49 Please refer to the Direct Testimony of Witness Verderame page 14, lines 12-14, where it states, “This modeling showed a net decrease in forecasted dispatch costs of \$12.78/MWh in the 2027 through 2029 operating period when operating on limestone.”
- a. Please confirm that Variable Operations and Maintenance (“VOM”) costs are included in the forecasted dispatch costs.
 - b. Please provide the forecasted VOM for East Bend from 2025 to 2029 without the limestone conversion.
 - c. Please provide the forecasted VOM for East Bend from 2025 to 2029 with the limestone conversion.

- d. Please provide the historical VOM for East Bend from 2019 through 2024.
- 1.50 Please refer to Attachment SEL-1 and SEL-2. Please provide the supporting workbook, with all formulas and links intact, used to develop Attachment SEL-1 and SEL-2.
- 1.51 Please refer to the Company’s response to Staff DR-01-001.
- a. Please explain if the Company has engaged in conversations with any potential suppliers of the lime product needed for the conversion.
 - b. Please explain if the Company has developed estimated costs for the lime product, and produce any such estimated lime costs.
- 1.52 Please refer to the Company’s response to STAFF-DR-01-002(a).
- a. Please explain the intended meaning of the phrase “a basket of market coals” as used in the referenced response.
 - b. Please describe Duke’s already-contracted coal supply in sufficient detail to allow comparison to the modeled coal supplies in the referenced response, included but not limited to providing volume, term, SO2 content, and heat content.
 - c. For each of the next ten years (2025-2034), please state the amount of coal supply already under contract as a percentage of forecasted annual tonnage requirements.
- 1.53 Please refer to the Company’s response to Staff DR-01-002(b), which states “Duke Energy’s configuration of the PowerSIMM model simulates future power prices starting from monthly forward pricing curves, specifically PJM AD Hub for Duke Energy Kentucky. These monthly power prices are then scaled to hourly, unit-level price shapes based on historical relationships between weather, gas, and power.”
- a. Please provide, in machine readable format, the monthly and hourly energy prices produced by PowerSIMM and used to inform the 2027-2029 model projections.
 - b. Please explain how the monthly prices are scaled to hourly shapes based on the historical relationships between weather, gas, and power.

- 1.54 Please refer to the Company's response to Staff-DR-01-007(a) where the Company said "Even before announced merchant generation retirements located within the DEOK zone occur, there is a limited supply of bilateral capacity within the DEOK zone."
- a. Please explain if the Company is aware of bilateral capacity opportunities within the DEOK zone.
 - b. Please explain if the Company has conducted any analysis to estimate the potential level of bilateral capacity within the DEOK zone. If the Company has conducted an analysis, please provide that analysis.
- 1.55 Please refer to the Company's response to Staff DR-01-008.
- a. Please confirm if the column labeled as "Margin (\$/MWh)" includes the Variable Operations and Maintenance ("VOM") costs for the East Bend Station.
 - i. If it does include VOM costs, please explain which categories of costs make up the total VOM.
 - ii. If it does not include VOM costs, please explain why.
 - b. Please explain the differences between the 2019-2023 fuel costs provided in STAFF-DR-01-008 and the 2019-2023 "East Bend Coal" costs provided in STAFF-DR-01-015 Attachment 1.
- 1.56 Please refer to the Company's response to Staff DR-01-022(a) in Case No. 2024-00197 where the Company stated "It is expected to take 4-5 years to convert East Bend to DFO. The offsite work scope includes construction of a new natural gas lateral connecting the plant to an interstate mainline and the completion of any required mainline expansion projects."
- a. Out of the 4-5 year timeframe estimated for conversion, please provide the specific timeline for the construction of the new gas lateral and any mainline expansion projects.
 - b. Please provide the capital costs for converting East Bend to natural gas.
 - c. Please provide the estimated capital costs of a new natural gas lateral.
 - d. Please provide the name of the interstate mainline that the lateral will be connected to.

- e. Please provide all analyses the Company has done to determine the availability of natural gas supply to East Bend.
 - f. Please provide any communications the Company has had with natural gas suppliers.
- 1.57 Please refer to the response to AG-DR-01-007 and the file named “AG-DR-01-007 CONF Attachment”.
- a. Please explain which costs are included in the Incremental Cost Offers for East Bend.
 - b. Please confirm that the Incremental Cost Offer for East Bend includes the cost of Magnesium Enhanced Lime.
 - i. If confirmed, please provide the Magnesium Enhanced Lime cost, in \$/MWH, for each of the months and years provided in the Attachment.
 - c. For each month and year provided in the Attachment, please provide the fuel cost included in the Incremental Cost Offer for East Bend.
 - d. Please explain which factors drove the increase in the Incremental Cost Offers over the period of June 2022 through February 2023.
 - e. Please provide East Bend’s Incremental Cost Offers for 2024.
 - f. For each offer type in columns D-K, please state the Energy Offer Schedule Type as defined by PJM (e.g., Cost (1) Schedule, Price Parameter Limited Schedule (79) Schedule, Price (99) Schedule).
- 1.58 Please refer to the Direct Testimony of Chad M. Donner, at page 3, and answer the following requests:
- a. What is the lowest sulfur content coal that East Bend is designed to burn?
 - b. What is the highest sulfur content coal that East Bend is designed to burn?
 - c. Confirm that the MEL scrubber efficiency for SO₂ removal is 97%. If anything but confirmed, please explain.
 - d. Elsewhere (e.g., Donner’s Direct at page 5, lines 16-17) it is noted that the limestone scrubber will be designed to achieve 98% removal efficiency. What would be the cost of the limestone scrubber in order to achieve 97% and not 98% removal efficiency with design fuel having 5.66 lb SO₂/MMBtu coal?
 - e. What would the limestone scrubber efficiency be if East Bend used the lowest sulfur coal it is designed to burn?

- f. What would the limestone scrubber cost be if East Bend used the lowest sulfur coal it is designed to burn?
- 1.59 Please refer to the Direct Testimony of Chad M. Donner, at page 8, line 20, and the Direct Testimony of John A. Verderame, at page 14, lines 6-7, each quantifying variable operating and maintenance costs.
- a. What costs are included in the “total variable operating and maintenance (VOM)” figures?
 - b. Please also refer to the Company’s response to STAFF-DR-01-0015(g), stating that Duke does not maintain data on “Variable Operating and Maintenance costs, \$/MWh”. Yet, the Company’s testimony repeatedly references and quantifies variable operating and maintenance (VOM) costs. Please reconcile these conflicting representations.
- 1.60 Please refer to the Direct Testimony of John A. Verderame, at page 6, line 19, and answer the following requests.
- a. Please provide detail on the “correct chemical content” of the MEL product – *i.e.*, compositions.
 - b. Please specify all tolerances (*i.e.*, +/-) for the chemical composition of the “correct chemical content.”
- 1.61 Please refer to the Direct Testimony of John A. Verderame, at page 17, lines 2-3, and answer the following requests.
- a. Please quantify the additional emissions of NO_x, SO₂, CO, PM_{2.5}, PM₁₀, H₂SO₄, N₂O, and CO₂ associated with the “additional generation in the limestone case of ~1,800 GWh over the three year period.”
 - b. What are the emissions of the above air pollutants for each year in the three-year period?
 - c. Have these emissions increases been accounted for in the permit application that was submitted in July 2024? If yes, please explain how.
- 1.62 Please refer to the Direct Testimony of Michael J. Geers, at page 13, lines 13-14, and answer the following requests:
- a. Please provide the expected reduction in the fixation lime noted in line 13.
 - b. Please provide the reduction in total mass noted in line 14.

- 1.63 Please refer to the Company's CPCN Application, at page 4, paragraph 9.
- a. Please quantify the increase (i.e., from the 40 to 50 gallons per 1000 cubic feet noted) in recycle slurry pumping that will be required when limestone is used as the reagent in place of MEL.
 - b. What is the additional VOM associated with this increased slurry recycle pumping? Please provide the supporting analysis or workpapers, if any.
- 1.64 Please refer to the Company's CPCN Application, at page 5, paragraph 10. Please quantify the reduction in the quantities of sly ash and (fixation) lime that will be needed when limestone is used as the reagent in place of MEL.
- 1.65 Please refer to the Company's CPCN Application, at page 8, paragraph 19.
- a. Please quantify the "reduced variable operational cost" noted.
 - b. Please quantify the "higher overall reagent expenditure due to the anticipated increase in economic dispatch."
 - c. Please quantify the expected "significantly lower" cost per ton of reagent, for each year from now through the retirement of East Bend.
 - d. Please quantify the reduction in "maintenance" noted.
 - e. Please explain how there will be "fuel cost savings" as a result of the Limestone Conversion Project that is noted on this page.
- 1.66 Please refer to the Company's CPCN Application, at page 13, paragraph 31. What are the "other environmental regulations" noted in this paragraph? Please explain.
- 1.67 Please refer to the Company's CPCN Application, Exhibit 4, AECOM's Preliminary Engineering Report, at page 6 of 78.
- a. Will thiosulfate be used as an additive as part of the LSIO project or only sodium formate? Please explain.
 - b. Please quantify the noted "significant improvement in dewatering" and provide supporting calculations and analysis, if any.
 - c. Please quantify the noted "reduced fixation lime requirements" and provide supporting calculations and analysis, if any.

- d. Has the “degradation in performance” discussed on the referenced document been observed at East Bend? If yes, please explain how the unit or scrubber has degraded due to lower capacity factor, and to the extent possible, please quantify the impact of such degradation.
 - e. To the extent known, please identify the other “utility that converted from MEL to LSIO operation.”
 - f. To the extent known, please identify units that have converted from MEL to LSIO operation.
- 1.68 To the extent known, please answer the following requests with respect to the Company, affiliated companies, and Duke Energy Corporation.
- a. Number of coal units, existing and retired since 2015.
 - b. Among the units identified in response to subpart a, please identify the units that use or used a WFGD system.
 - c. Among the units identified in subpart b, please identify which use an MEL process and which use an LSIO process.
 - d. Among the units identified in subpart b, please identify which have undergone a conversion like the one proposed for East Bend 2’s WFGD system, if any?
 - e. For each unit identified in subpart d, please explain how the cost and operational performance for the unit compares to the projected cost and operational implications of the proposed Limestone Conversion Project.
- 1.69 Please refer to the Company’s CPCN Application, at page 8 of 78, Table 3-1.
- a. Please provide a basis for why 3.2% wet coal sulfur content was used in the evaluation.
 - b. Given that the East Bend boiler is capable of using low sulfur bituminous coals, why were lower coal sulfur contents not evaluated? Please explain.
- 1.70 Please refer to the Company’s response to STAFF-DR-01-002(a). Provide a list of all assumptions that were “based on guidance from plant engineering staff.”
- 1.71 Please refer to the Company’s response to STAFF-DR-01-005(b). Please provide the composition of the “correct chemical content” noted in this response.
- 1.72 Please refer to the Company’s response to STAFF-DR-01-0013. Please specify what retirement date (12/31/2038 or 12/31/2035) is used in the analyses offered in support of the requested CPCN. If different retirement dates are used in different analyses, please specify the details of where each retirement date is used.

- 1.73 Please refer to Attachment 2 to STAFF-DR-01-015. Please explain the cause(s) of the relatively high EFOR of 11.62 for 2021.
- 1.74 Please refer to the Company's response to STAFF-DR-01-022
- a. Please provide the names of the "eleven potential lime suppliers".
 - b. Please provide the names of the companies that provided responses.
- 1.75 Please refer to the Company's response to STAFF-DR-01-024, and the Company's plan to comply with greenhouse gas emission standards by co-firing coal with natural gas by January 1, 2030, and retire by December 31, 2028.
- a. Under this plan, what are the estimated SO₂ emissions (before scrubbing), by month starting January 1, 2030, through either a December 31, 2035, or December 31, 2038, retirement date?
 - b. How have the reduced pre-scrubber SO₂ rates with gas co-firing been accounted for in the analysis presented for this CPCN action, if at all? Please explain in full.

Dated: September 20, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

This is to certify that the foregoing copy of Sierra Club’s First Request for Information to Duke Energy Kentucky, Inc. in this action is being electronically transmitted to the Commission on September 20, 2024, and that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding.

/s/ Bethany N. Baxter
Bethany N. Baxter