

**KyPSC Case No. 2024-00197**  
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VERIFICATION

STATE OF NORTH CAROLINA )  
 )  
COUNTY OF ~~MECKLENBURG~~ <sup>82</sup> ) SS:  
 Lincoln )

The undersigned, Tyler Cook, Engineer III, being duly sworn deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information, and belief.

Tyler Cook  
Tyler Cook, Affiant

Subscribed and sworn to before me by Tyler Cook on this 3rd day of October, 2024.

Sheila Lemoine  
NOTARY PUBLIC

SHEILA LEMOINE  
Notary Public, North Carolina  
Lincoln County  
My Commission Expires  
July 21, 2029

My Commission Expires: July 21, 2029

**Duke Energy Kentucky  
Case No. 2024-00197  
SIERRA Second Set of Data Requests  
Date Received: September 25, 2024**

**SIERRA-DR-02-001**

**REQUEST:**

Refer to Company response SIERRA-DR-01-005\_Attachment. Please provide the supporting calculations for the PVRR values shown including, but not limited to, post-processing of model outputs or other cost analyses done outside of the model.

**RESPONSE:**

PVRR for each portfolio is calculated directly in the Encompass model and there is no post-processing of those results.

**PERSON RESPONSIBLE:** Matthew Kalemba

**Duke Energy Kentucky**  
**Case No. 2024-00197**  
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**CONFIDENTIAL SIERRA-DR-02-002**  
**(As to Attachment only)**

**REQUEST:**

Refer to Company response SIERRA-DR-01-009 Attachments 1 through 20.

- a. Please explain what is included under “fixed cost (\$000)” for East Bend in the Encompass “Resource Annual” report, for each scenario modeled.
- b. Please provide a breakdown of the fixed costs at East Bend that are included in the model, including calculations that support the values reported in Resource Annual.
- c. Are there other fixed costs at East Bend that are included in the PVRR but are estimated outside of the model?
  - i. If so, please provide such costs and describe what is included.
  - ii. If not, please explain why not.

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)**

- a. Fixed costs for East Bend included Limestone Conversion Costs in 2025-2026 in all portfolios, Dual Fuel Operation (“DFO”) costs in 2030 in portfolios with DFO and Natural Gas Conversion (“NGC”) Costs in 2030 in portfolios with NGC, and Firm Transportation/Gas Pipeline Costs when operating on Dual Fuel or 100% Natural Gas Conversion. Additionally for cases where East Bend was operating past 2035 costs were allocated for maintenance items that would be necessary to continue operating.

- b. Please see SIERRA-DR-02-002 Confidential Attachment for cost breakdown for each item included in fixed costs. Limestone conversion costs were included in all scenarios while costs associated specifically with DFO and NGC were included only in scenarios where one of the two conversions was performed. Post '35 Running Costs were only applied to scenarios where coal handling equipment was required after 2034 (DFO and normal operation.)
- c. There are additional costs for existing units calculated outside of the model that contribute to the PVRR, this includes both Capital and Fixed O&M costs associated with existing units based on capacity factors and starts that would result in units hitting minor and major maintenance intervals. These two strings of numbers represent costs for all existing resources and not just East Bend. See these costs for each portfolio on the Existing Costs tab in SIERRA-DR-02-002 Confidential Attachment.

**PERSON RESPONSIBLE:** Tyler Cook

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**SIERRA-DR-02-002  
CONFIDENTIAL ATTACHMENT**

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**CONFIDENTIAL SIERRA-DR-02-003**  
**(As to Attachment only)**

**REQUEST:**

Refer to Company response to SIERRA-DR-01-011 Attachment.

- a. Please provide the data that was used to develop new resource costs.
- b. Please provided analyses done by or for the Company to develop its final new resource cost inputs used in Encompass.
- c. If any RFP bid responses were used in developing these costs, please provide such bids and the associated RFP.

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)**

- a. Please see KSES-DR-01-045(d) and (e) for data used for generic unit costs.
- b. Please see SIERRA-DR-02-003(b) Confidential Attachment.
- c. No RFP bids were used to inform resource costs.

**PERSON RESPONSIBLE:** Tyler Cook



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**SIERRA-DR-02-003(b)  
CONFIDENTIAL ATTACHMENT**

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**Duke Energy Kentucky**  
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**Date Received: September 25, 2024**

**CONFIDENTIAL SIERRA-DR-02-004**  
**(As to Attachment only)**

**REQUEST:**

Refer to Company response STAFF-DR-01-022.

- a. Please provide the capital, fixed O&M, and variable O&M costs assumed for co-firing East Bend, including supporting analyses and documentation for these costs.
- b. Please provide the changes in the operating characteristics of East Bend that would result from these pathways, including supporting analyses and documentation for these changes.
- c. Please provide the capital, fixed O&M, and variable O&M costs assumed for converting East Bend, including supporting analyses and documentation for these costs.
- d. Please provide the changes in the operating characteristics of East Bend that would result from these pathways,

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)**

- a. The conversion cost associated with co-firing at East Bend was modeled as a fixed cost in 2030. The value used can be found in SIERRA-DR-02-002 Confidential Attachment. The resource VOM was not adjusted, but the gas price used when co-firing was adjusted to account for the reduction in VOM due to the reduction in reagents required. Please see SIERRA-DR-02-004 Confidential Attachment for the

gas price adjustment calculations. Please refer to KSES-DR-01-051(a) for more information regarding the analyses for these costs.

- b. The minimum capacity of East Bend was reduced to 100 MW from 300MW, the Heat Rate was increased by 1 percent. Please see KSES-DR-01-052(b) for more information regarding the analyses for these changes.
- c. The conversion costs associated with converting East Bend to natural gas can be found in SIERRA-DR-02-002 Confidential Attachment. The resource VOM was not adjusted but unnecessary reagents were removed which reduced the total VOM input into the model. Please see SIERRA-DR-02-004 Confidential Attachment for the natural gas conversion VOM used. Please refer to KSES-DR-01-052(a) for more information regarding the analyses for these costs.
- d. The minimum capacity of East Bend was reduced to 217.2 MW from 300 MW and the heat rate was increased by 2 percent. Please see KSES-DR-01-052(b) for more information regarding the analyses for these changes.

**PERSON RESPONSIBLE:** Matthew Kalemba

**CONFIDENTIAL PROPRIETARY TRADE  
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**SIERRA-DR-02-004  
CONFIDENTIAL ATTACHMENT**

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**Duke Energy Kentucky**  
**Case No. 2024-00197**  
**SIERRA Second Set of Data Requests**  
**Date Received: September 25, 2024**

**SIERRA-DR-02-005**

**REQUEST:**

Refer to Company response STAFF-DR-01-023.

- a. Please provide the inputs and outputs for modeling of compliance pathways not included in portfolio results shown in the IRP, such as coal CCS.
- b. Please provide pre- and post-processing files used to develop or analyze these pathways.
- c. Please provide the capital, fixed O&M, and variable O&M costs assumed for these pathways.
- d. Please provide any other changes in the operating characteristics of East Bend that would result from these pathways.

**RESPONSE:**

Objection. This request is overbroad, unduly burdensome and seeks information beyond the scope of this proceeding and that does not exist or is that is not maintained in the manner requested. This request is further objectionable insofar as it seeks analysis that was not performed by the Company.

**PERSON RESPONSIBLE:**           Legal

**Duke Energy Kentucky**  
**Case No. 2024-00197**  
**SIERRA Second Set of Data Requests**  
**Date Received: September 25, 2024**

**CONFIDENTIAL SIERRA-DR-02-006**  
**(As to Attachments only)**

**REQUEST:**

Refer to Docket Number 2024-00152, application for a CPCN for converting the wet FGD from a quicklime to a limestone system.

- a. Please provide the capital, fixed O&M, and variable O&M costs associated with this retrofit.
- b. Were any of the costs in response to (a) included in the IRP modeling?
  - i. If so, please explain where these costs were included, including what inputs were changed and in what scenarios they were changed.
  - ii. If not, please explain why not.
- c. Please provide the annual costs of quicklime at East Bend assumed in the CPCN modeling.
- d. Were any of the costs in response to (c) included in the IRP modeling?
  - i. If so, please explain where these costs were included, including what inputs were changed and in what scenarios they were changed.
  - ii. If not, please explain why not.
- e. Please provide the annual costs of limestone (post conversion) at East Bend assumed in the CPCN modeling.
- f. Were any of the costs in response to (e) included in the IRP modeling?

- i. If so, please explain where these costs were included, including what inputs were changed and in what scenarios they were changed.
  - ii. If not, please explain why not.
- g. Please provide any analyses the Company conducted on the impacts of dispatch costs from converting the FGD.
- h. Please provide any analyses the Company conducted to estimate the costs and/or benefits of converting the FGD.
- i. Please provide any other analyses that the Company conducted to evaluate the decision to convert to limestone.

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachments only)**

- a. As discussed in Witness Donner's direct testimony filed in Docket Number 2024-00152 on page 7, lines 10 through 19, the fully loaded estimated cost of construction (with material, engineering, internal and external labor, contingency, and escalation) is approximately \$125.8 million. The Company anticipates that there will be minimal (<\$10,000 per year) incremental operation and maintenance costs (O&M), excluding the reagent commodity. See SIERRA-DR-02-006 Confidential Attachment 1 DEK Cost Breakdowns Tab for the projected limestone reagent cost post conversion.
- b. No.
  - i. N/A
  - ii. No, due to the timing of the IRP an earlier estimate was used. Capital costs for the limestone conversion in the IRP modeling were based off an earlier

\$95 million estimate. This conversion cost can be found on the Fixed Costs input for East Bend in all portfolios. The only other adjustment modeled was the substitution of the quicklime reagent for limestone and the associated cost difference for making this change. The change in reagent cost can be found on the Energy Costs input. These were a base assumption and shared in all portfolios.

- c. The projected annual costs of quicklime (no conversion) at East Bend assumed in the initial CPCN modeling are shown below.

<b>Base Lime Case (No Conversion)</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>
FGD Lime Cost (\$/TN)	\$356.4	\$375.2	\$395.0
Projected FGD Lime Annual Cost (\$M/Yr)	\$22.1	\$19.9	\$23.0

- d. No, costs from response c. were not used.
  - i. N/A
  - ii. IRP modeling assumed limestone reagent replaced quicklime reagent starting 1/1/2027 as a base assumption.
- e. The projected annual costs of limestone (post conversion) at East Bend assumed in the CPCN modeling are shown below.

<b>Limestone Case (With Conversion)</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>
FGD Limestone Cost (\$/TN)	\$18.5	\$19.2	\$20.0
Projected FGD Limestone Annual Cost (\$M/Yr)	\$2.6	\$2.4	\$2.8

- f. Yes.
  - i. IRP modeling assumed limestone reagent replaced quicklime reagent starting 1/1/2027 as a base assumption. The \$/ton values from e. are the same values used to calculate the VOM rate found in the Energy Costs input in EnCompass.
  - ii. N/A



- g. Please see SIERRA-DR-02-006 Confidential Attachment 1.
- h. Please see SIERRA-DR-02-006 Confidential Attachment 1.
- i. In August 2023 Duke Energy evaluated the Limestone Conversion project through the Encompass model. This is the same Encompass model software that is used for IRP filings. Please see SIERRA-DR-02-006 Confidential Attachment 2.

**PERSON RESPONSIBLE:** Chad Donner – a., c., e.  
Matt Kalemba – b., d., f., i.  
Ryan Trogstad – g., h.

**CONFIDENTIAL PROPRIETARY TRADE  
SECRET**

**SIERRA-DR-02-006  
CONFIDENTIAL ATTACHMENTS 1 & 2**

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