

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

**In the Matter of:**

<b>ELECTRONIC JOINT APPLICATION OF</b>	)	
<b>KENTUCKY UTILITIES COMPANY AND</b>	)	
<b>LOUISVILLE GAS AND ELECTRIC COMPANY</b>	)	<b>Case No. 2022-00402</b>
<b>FOR CERTIFICATES OF PUBLIC CONVENIENCE</b>	)	
<b>AND NECESSITY AND SITE COMPATIBILITY</b>	)	
<b>CERTIFICATES AND APPROVAL OF A DEMAND</b>	)	
<b>SIDE MANAGEMENT PLAN</b>	)	

**SIERRA CLUB’S SUPPLEMENTAL REQUESTS FOR INFORMATION  
TO KENTUCKY UTILITIES COMPANY AND LOUISVILLE GAS AND ELECTRIC  
COMPANY**

Sierra Club submits these Supplemental Requests for Information (“RFI”) to Kentucky Utilities Company and Louisville Gas and Electric Company (“KU/LG&E” or the “Companies”) in the above-captioned proceeding pursuant to the Commission’s January 6, 2023 Order. Pursuant to that Order, the Companies shall respond to these requests for information no later than May 4, 2023. Please produce the requested information in electronic format whenever possible, and to the following recipients:

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## **DEFINITIONS**

Unless otherwise specified in each individual interrogatory or request, “you,” “your,” the “Companies,” or “KU/LG&E,” refers to Kentucky Utilities Company, Louisville Gas and Electric Company, and their 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 or subject to your control, identify the person with possession, custody, or control. If any document was in your possession or custody 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, and originals either (1) in the possession, custody or control of the Companies regardless of where located, or (2) produced or generated by, known to or seen by the Companies, but now not in their possession, custody or control, regardless of where located or whether 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), agendas, 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 Companies;
- b. With respect to a document, to state the nature of the document in sufficient detail for identification in a request for production, to state its date, to state 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 (within Ky. R. Civ. P. 34.01) of the originals of the 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 custody 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. Please answer the questions and sub-questions in the order in which they are listed and in sufficient detail to provide a complete and accurate answer to the question.
7. If any question appears confusing, please request clarification from the undersigned counsel.
8. 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.
9. 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 preparation 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.
10. Rather than waiting to provide all of the responses at the same time, please provide individual responses as each becomes available.
11. 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(s) and/or workpapers that contain the information. The citation shall include the title(s) of the document(s), relevant page number(s), and to the extent possible paragraph number(s) and/or chart(s)/table(s)/figure number(s).
12. 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.
13. 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.

14. 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.

15. If the response to any question is voluminous, please provide separately an index to the materials contained in the response.

16. 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.

17. 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.

18. 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.

19. Sierra Club reserves the right to serve supplemental, revised, or additional discovery 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.

Dated: April 14<sup>th</sup>, 2023

*Of counsel* (not licensed in Kentucky)

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Respectfully submitted,

/s/ Joe F. Childers  
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**CERTIFICATE OF SERVICE**

I certify that a copy of the foregoing Sierra Club submission was served upon all parties of record in this proceeding on April 14<sup>th</sup>, 2023, by first-class U.S. mail, hand delivery, and/or e-mail, as permitted by the presiding officer.

/s/ Joe F. Childers  
Joe F. Childers, Esq.  
Childers & Baxter, PLC



**EXHIBIT A**

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

**In the Matter of:**

<b>ELECTRONIC JOINT APPLICATION OF</b>	)	
<b>KENTUCKY UTILITIES COMPANY AND</b>	)	
<b>LOUISVILLE GAS AND ELECTRIC COMPANY</b>	)	<b>Case No. 2022-00402</b>
<b>FOR CERTIFICATES OF PUBLIC CONVENIENCE</b>	)	
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**SIERRA CLUB’S SUPPLEMENTAL REQUESTS FOR INFORMATION  
TO KENTUCKY UTILITIES COMPANY AND LOUISVILLE GAS AND ELECTRIC  
COMPANY**

- 2.1. For each of the Companies’ existing gas generating units, please indicate:
  - a. The gas line serving that generating unit.
  - b. Whether the generating unit has dual fuel capability with onsite fuel storage.
  - c. What percentage of the generating unit’s peak gas consumption is supplied via firm gas transportation contracts.
  - d. The geographic area from which gas supply for that generating unit is sourced.
  - e. What percentage of the generating unit’s peak gas consumption comes from supply contracts that are longer than one year in duration.
  - f. What, if any, impacts were observed on gas supply or transportation to that generating unit during Winter Storm Elliott (December 21-27, 2022)?
  - g. If there were any impacts to that generating unit during the period December 21-27, 2022, please quantify the reduction in the generating unit’s output due to the disruption to gas supply or transportation, and the start and end time for that reduction.
  
- 2.2. Please refer to the direct testimony of Lonnie Bellar at page 7, which indicates that the proposed gas combined cycle units could be served by the Texas Gas, Texas Eastern, or Tennessee Gas pipelines.
  - a. Please confirm that each of those pipelines is primarily supplied from gas fields in the Gulf of Mexico. If not, please explain where the gas supply is sourced from.

- b. Are the Companies aware of past events in which there were simultaneous disruptions to supply on more than one of those pipelines, such as a hurricane shutting down gas production in the Gulf of Mexico?
  - c. If the Companies are aware of such past events, please state the event and, to the extent known to the Companies, the duration of the disruption to each pipeline's supply.
- 2.3. For each of the Companies' existing generating units, please provide GADS data showing all forced outage events from 2018 to 2022, including the start and end time for the outage, the megawatts (MW) on outage, and the cause code or any other information reported to NERC about the cause of the outage.
- 2.4. Please see the reserve margin targets shown on pages D3-D4 of Exhibit SAW-1.
- a. Please provide the worksheets, with formulae intact, for the analysis used to arrive at the reserve margin targets used in the Companies' Plexos analysis.
  - b. Please document why the target reserve margin includes separate components for "fully dispatchable" and "intermittent and limited-duration" resources, and how the Companies arrived at those percentages.
  - c. Please explain whether Plexos uses a seasonal capacity constraint or an annual constraint.
  - d. Please state whether the hourly load values in each year of the Plexos model are summer peaking or winter peaking.
  - e. Please confirm that the Plexos modeling uses a reserve margin of approximately 20%. If not confirmed, please state the approximate reserve margin.
  - f. Please explain the discrepancy between the Plexos reserve margin of approximately 20% and the values for target summer reserve margin (17%) and winter reserve margin (24%).
- 2.5. Please see the Available Transmission Capacity analysis described at pages D15-D16 of Exhibit SAW-1, and documented in the Companies' response to Sierra Club Question No. 1-7.
- a. Please describe how that analysis was used to arrive at the assumption that "during peak hours when ATC is most likely needed to ensure reliable supply, ATC in ELDCM is assumed to be approximately 500 MW two-thirds of the time and zero MW one-third of the time."
  - b. Alternatively, if that analysis was not used to arrive at the assumption, please describe how the Companies arrived at that assumption.
- 2.6. Please see the discussion of Neighboring Regions at pages D11-D12 of Exhibit SAW-1.
- a. Please describe how the assumed reserve margins in neighboring regions were used to determine the availability of imports during the Companies' peak demand periods, including how the calculated availability of supply from those

- neighboring regions is integrated with the Available Transmission Capacity analysis.
- b. Please provide the worksheets, with formulae intact, for that analysis.
- 2.7. Please see the capacity contribution analysis described at pages D15-D16 of Exhibit SAW-1.
- a. Please describe what if any assumptions for forced outage rates or derates were used to reduce the estimated capacity contribution of the 480 MW of SCCTs.
  - b. Please describe what if any assumptions for correlations in forced outage rates between the 480 MW of SCCTs and the Companies' other generating units were used to reduce the estimated capacity contribution of the 480 MW of SCCTs.
- 2.8. Please provide any analysis the Companies directed to determine that retiring Haefling 1-2 and Paddy's Run 12 in 2025 and replacing that capacity with new resources was more economic than continuing to operate those units. If that analysis was not conducted, please explain why.
- 2.9. Please refer to Exhibit 5, Mill Creek NGCC Site Assessment Report.
- a. Have the Companies conducted any analysis or assessment of the public health impacts of the proposed Mill Creek NGCC?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.
  - b. Have the Companies conducted any analysis or assessment of the economic impacts of public health impacts that will be generated by the proposed Mill Creek NGCC?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.
- 2.10. Please refer to Exhibit 6, Brown NGCC Site Assessment Report.
- a. Have the Companies conducted any analysis or assessment of the public health impacts of the proposed Brown NGCC?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment.
    - ii. If not, please explain why the Companies have chosen not to conduct such an analysis or assessment.
  - b. Have the Companies conducted any analysis or assessment of the economic impacts of public health impacts that will be generated by the proposed Brown NGCC?

- i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment.
    - ii. If not, please explain why the Companies have chosen not to conduct such an analysis or assessment.
- 2.11. For each of the four units Mill Creek Units 1 and 2, Ghent Unit 2, and Brown Unit 3:
  - a. Have the Companies conducted any analysis or assessment of the public health impacts of the unit?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment. Please provide such copies for either 2018 to the present or, if there is no such analysis or assessment in that time frame, of the most recent analysis or assessment and all associated communications.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.
  - b. Have the Companies conducted any analysis or assessment of the economic impacts of public health impacts of the unit?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment. Please provide such copies for either 2018 to the present or, if there is no such analysis or assessment in that time frame, of the most recent analysis or assessment and all associated communications.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.
- 2.12. For each proposed solar PPA and for the Rhudes Creek and Ragland PPAs:
  - a. Have the Companies conducted any analysis or assessment of the public health impacts of the underlying solar generation?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.
  - b. Have the Companies conducted any analysis or assessment of the economic impacts of public health impacts of the underlying solar generation?
    - i. If so, please provide all copies of such analysis or assessment and all communications regarding such analysis or assessment. Please provide such copies for either 2018 to the present or, if there is no such analysis or assessment in that time frame, of the most recent analysis or assessment and all associated communications.
    - ii. If not, please explain why the Companies have chosen not to conduct such analysis or assessment.

- 2.13. Please see the Companies’ response to the Attorney General’s initial request for information, number 23, which states “the LG&E-KU transmission planning team reached out to EKPC to review respective resource and transmission plans and coordinate, as needed” and that “there has been . . . agreement to schedule a follow up meeting in April.” Please provide an update on the status of any resource and transmission coordination and planning with EKPC, including any planning or coordination regarding transmission improvements or upgrades.
- 2.14. Please refer to the Companies’ response to LFUCG/LJCM’s initial request for information, number 15, which states: “The proposed retirement of Mill Creek Unit 1 is an example where significant new regulatory requirements (Effluent Limitation Guidelines) and extraordinary investment needs (cooling tower to meet 316b requirements incur capital and operating costs that outweigh the costs incurred by transitioning to alternative energy supplies. Examples of regulatory requirement could be National Ambient Air Quality Standards, Cross State Air Pollution Rules, Effluent Guidelines, Regional Haze, Hazardous Air Pollution, or greenhouse gas standards of performance that are not achievable or the capital and operating costs of compliance technologies are higher than alternative generation sources.” On April 3, 2023, the Environmental Protection Agency released its proposed rule, “National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review.”<sup>1</sup>
- a. Please provide any assessments or analyses of the impact of the proposed rule on Mill Creek Units 1 and 2, Ghent Unit 2, and/or Brown Unit 3, including on capital and operating costs.
  - b. Please explain whether the proposed rule is anticipated to impact Mill Creek Units 1 and 2, Ghent Unit 2, and/or Brown Unit 3 and, if so, how.
- 2.15. Please refer to the Companies’ response to the Commission Staff’s first request for information, question 58.
- a. Please confirm that the SERC Reliability Corporation is the North American Electric Reliability Corporation (NERC) regional entity responsible for ensuring reliability within the LG&E/KU balancing authority. If not confirmed, please state which NERC regional entity is responsible for this task and what, if any, relationship exists between SERC and LG&E/KU.
  - b. Please describe what, if any, role SERC played in LG&E/KU’s response to Winter Storm Elliott.
  - c. Please confirm that the Tennessee Valley Authority (TVA) is the reliability coordinator for LG&E/KU. If not confirmed, please state the individual or entity that is the reliability coordinator for LG&E/KU.

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<sup>1</sup> This proposed rule is available at [https://www.epa.gov/system/files/documents/2023-04/EPA%20OAR%20NESHAP%20MATS\\_RTR\\_Proposal%20%282060-AV53%29\\_EPA\\_3.31.23\\_Signature.pdf](https://www.epa.gov/system/files/documents/2023-04/EPA%20OAR%20NESHAP%20MATS_RTR_Proposal%20%282060-AV53%29_EPA_3.31.23_Signature.pdf).

- d. Please describe what, if any, role LG&E/KU's reliability coordinator played in LG&E/KU's response to Winter Storm Elliott.
  - e. Please explain whether SERC, LG&E/KU's reliability coordinator, or another entity is responsible for setting a contingency reserve or minimum reserve capacity requirement for LG&E/KU.
  - f. Please describe any such contingency reserve or minimum reserve capacity requirement from 2018 to the present.
- 2.16. For each of the four units Mill Creek Units 1 and 2, Ghent Unit 2, and Brown Unit 3:
- a. Please state the source of the coal used by the unit in the past year.
  - b. Please describe how coal is transported to the unit, including the amount of coal transported by barge and the amount of coal transported by rail, in the past year.
- 2.17. Please refer to Table 8 at page 26 of the "2022 RTO Membership Analysis" (cited in the Direct Testimony of David S. Sinclair at page 26, lines 17-19 as KU/LG&E's "recently filed RTO study"):
- a. Table 8 is titled "Total Incremental Benefits/(Costs) by Case (Nominal \$M)". Please confirm that the data in Table 8 actually reflects only the net benefits of energy and capacity values of joining PJM. If not confirmed, please state what benefits and costs this data reflects.
- 2.18. Please refer to "2022 RTO Membership Analysis," Exhibit 2 "Guidehouse Energy Markets Analysis," at pages 3-35. For the referenced capacity expansion assessment:
- a. Please confirm that Guidehouse used Power System Optimizer to perform the capacity expansion assessment. If not confirmed, please provide the name of the software used to perform the capacity expansion assessment. If the tool is proprietary, please explain the method it uses.
  - b. Please provide all input and output files supporting the capacity expansion assessment (in electronic, machine readable format with formulae intact).
  - c. Please describe any methods and assumptions used in the capacity expansion model to adjust costs and benefits that occur in different years in order to optimize net benefits, such as calculations of present value, annualization or leveling of capital costs, capital recovery factors, etc. Among the assumptions provided, please include the discount rate, whether the discount rate used reflects real vs. nominal, assumed useful life or depreciation schedule of capital investments if applicable, and any other assumed parameters used for these calculations. Please provide descriptions and citations to support the assumptions, together with any documents, analyses, or forecasts relied upon to calculate such parameters.
- 2.19. Please refer to "2022 RTO Membership Analysis," Exhibit 2, Appendix B, Table B4 "RTO Capacity Expansion and Reserve Margins" at pages 4-69:
- a. Please confirm that, in the RTO case, the capacity expansion model was constrained to add resources in KU/LG&E such that effective summer UCAP

each year equals  $FPR \cdot (1 + 9.18\%)$ , where FPR is as listed in Table B4 and 9.18% is the assumption for PJM's required UCAP reserve margin. If not confirmed, please provide the accounting used to calculate the UCAP constraint in the RTO case of the capacity expansion model in terms of KU/LG&E peak load, coincidence factor, PJM Forecast Pool Requirement, and any other applicable parameters.

- b. Please explain why the capacity expansion model produces an effective margin to FPR (as shown in Table B4) that in all years exceeds 10%.
- 2.20. Please refer to "2022 RTO Membership Analysis," Exhibit 2, Appendix B "Capacity Additions and Retirements," Table B2 at pages 4-68 and Table B5 at pages 4-69:
  - a. Please confirm that a single generator entry/exit schedule was developed across Cases 1-3 in the capacity expansion model for the RTO scenario, and a second entry/exit schedule was developed for the Standalone scenario. If not, please state which of RTO Cases 1-3 use different entry/exit schedules, and provide those schedules with relevant year, fuel type, and nameplate capacity. Likewise, if not, please state which of Standalone Cases 1-3 use different entry/exit schedules, and provide those schedules.
  - b. Please explain which set of Case assumptions (fuel price, CO2 price, emissions reductions, etc.) was used to develop this entry/exit schedule, or (if different from the Case assumptions), what assumptions (such as fuel price, CO2 price, emissions reductions, etc.) were used in the capacity expansion model in its development of a cost-optimal generator entry schedule.
- 2.21. Please refer to "KU/LG&E 2022 RTO Membership Analysis" at Exhibit 2, Section 3.3 "Carbon PJM Build" at page 3-39, and to Attachment 1 in response to Sierra Club's Initial Request for Information question 12a, file "*20221026\_2022RTO\_SummaryofGuidehouseResults\_D02.xlsx*" therein:
  - a. Please explain whether any of the RTO Cases 1-3 has different generator entry than RTO Case 4. If so, referring to worksheet "Summary" in the referenced Excel file, please explain why the net benefits of each Case in the RTO scenario is calculated using the same avoided capacity savings.
  - b. On the referenced page, Exhibit 2 states that "Along with the carbon prices and regulation, discussed in Section 2.3.8, the PJM build was adjusted to meet the required targets." Please explain how this adjustment was calculated, providing all documents, analyses, or forecasts relied upon in making such calculation.
- 2.22. Please refer to "2022 RTO Membership Analysis" at page 14, at page 39, and Exhibit 2 "Guidehouse Energy Markets Analysis", Appendix B, Table B3 at page 4-68 and Table B6 at page 4-70.
  - a. Noting that the schedule of KU/LG&E generator retirements is identical between the Standalone case and the RTO case, please confirm that the capacity expansion

model was not able to select any generator retirements in KU/LG&E as part of its cost optimization. If not, please explain.

- 2.23. Please refer to “2022 RTO Membership Analysis”, Exhibit 2, Section 2.3.1 “Production Cost Modeling”, at page 2-30. For the referenced production cost modeling:
- a. For each Case in both the Standalone and RTO scenarios, please provide all input and output files supporting the production cost model (in electronic, machine readable format with formulae intact). Please include among these the following:
    - i. The list of all generators modeled in PJM, their IDs, and their assumed characteristics such as full load heat rate, variable operations and maintenance cost, fuel cost, nameplate capacity, etc.
    - ii. A list of the generators that retire and enter service in the PJM model, including generator ID, fuel type, nameplate capacity, year of entry or exit, and whether the entry or exit was provided as an input to the model or selected by the model as part of the capacity expansion model’s cost optimization.
    - iii. The modeled annual generation in PJM, in MWh and by fuel type.
    - iv. The load in PJM, by annual energy and peak winter and summer load (or just peak summer load if all years are summer peaking). Please also include hourly PJM load and KU/LG&E for each year if available.
    - v. The modeled average annual load LMP and generator LMP in PJM. Please include this data by PJM zone if available.
    - vi. The modeled hourly load LMP and generator LMP in PJM and KU/LG&E. Please include this data by PJM zone if available.
    - vii. The supply curve consisting of aggregate \$/MWh variable costs of each generator in the case for each year. Please provide this separately for PJM and KU/LG&E.
    - viii. A list of the generators in KU/LG&E that are forced to exit service and those that are forced to enter service as an input to the model, including the year of entry or exit and other relevant characteristics if not already provided.
    - ix. Any constraints limiting the model’s ability to add new cost effective generation.
    - x. The hourly solar and wind curtailment in KU/LG&E for all years.
  - b. Please provide the dollar value of relevant penalty factors utilized in the production cost model, such as for simulated reserve shortages, load shed, emergency imports, etc.
  - c. Please state whether an evaluation was performed of congestion surplus rents in the RTO cases associated with congested interchange between KU/LG&E and PJM. If so, please provide that evaluation.



- 2.24. Please refer to “2022 RTO Membership Analysis” Exhibit 2, Appendix C “Production Costs”, Table C1 at page 4-1 and Table C5 at page 4-5.
- a. Please explain why the imports cost and exports revenue in RTO Case 1 in Table C5 is the same as imports cost and exports revenue in the Standalone Case 1 in Table C1.
  - b. Please explain how imports cost and exports revenue is calculated in the RTO cases, and how it is accounted for in adjusted production cost in the RTO cases.
  - c. Please provide the imports cost and exports revenue and MWh quantities in the RTO cases for each year, and for each hour of each year.
- 2.25. Please refer to “2022 RTO Membership Analysis” Exhibit 2, Section 2.3.7 “Interchange Limits” at page 2-32.
- a. The Exhibit states that “Only the handful of paths in the topographical vicinity of LG&E / KU are focused on in this analysis.” Please explain which paths and the transfer capability of those paths.
  - b. The Exhibit states, “The export capability of LG&E / KU is capped at 300 MW which is consistent with historical transactions.” In 2021, PJM reported a Total Transfer Capability for transfers from KU/LG&E to PJM of 1,927 MW.<sup>2</sup> Please explain the difference.
  - c. Please state the assumed import capability from PJM to KU/LG&E in the production cost model.
- 2.26. Please refer to Attachment 1 in response to Sierra Club’s Initial Request for Information question 12a, and to file *20221017\_LAK\_ExpPlanFixedCosts\_2022RTOAnalysis\_D02.xlsx* therein, as well as “2022 RTO Membership Analysis”, Exhibit 2, Appendix B “Capacity Additions and Retirements”, Table B5 at page 4-69:
- a. On worksheet “RRProfiles” of the referenced file, rows 2 – 6 contain an annualization profile for the capital costs of each of five types of new entrant generator, reflecting the percent of capital cost accrued in each of many years. Please provide the method for developing each of these capital annualization profiles, including input parameters (such as discount rate, depreciation schedule, etc.), real vs. nominal, descriptions and citations supporting those input parameters, and all input files supporting calculation of the annualization profile (in electronic, machine readable format with formulae intact).
  - b. On worksheet “RTO” of the referenced file, please confirm that the capacity additions by year labeled “wind” in column E in fact refer to the capacity expansion model results for utility-scale solar, or if not, then please explain the discrepancy relative to Table B5. Please confirm that the capital costs of wind

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<sup>2</sup> PJM, *Data Analysis*, (Aug. 27, 2021), available at <https://pjm.com/-/media/committees-groups/committees/pc/2021/20210827-workshop-4/20210827-item-04-data-analysis-presentation.ashx>.

were applied to utility solar entry in the calculation of net benefits for the RTO case, or if not, please explain.

2.27.

- a. [REDACTED]
- b. [REDACTED]
- c. [REDACTED]
- d. [REDACTED]

2.28. Please refer to Attachment 1 in response to Sierra Club’s Initial Request for Information question 12a, and to files *LGE Case 1 RTO Output 10242022.xlsx* and *LGE Case 3 RTO Output 10242022.xlsx* therein, as well as confidential Attachment 4 in response to Sierra Club’s Initial Request for Information question 12a:

- a. Exhibit 2 of the 2022 RTO Membership Analysis describes Case 1 as the “baseline market scenario based on Guidehouse’s Spring 2022 Reference Case and LG&E / KU provided fuel prices”. It then describes Case 3 as “high fuel with no additional carbon emission regulation”. Please confirm that the first referenced file corresponds to Case 1, and the second to Case 3, or if not then please explain. On worksheet “NG Prices” of each of the referenced files, please explain why the Mill Creek natural gas prices in the high-price Case 3 file are the same as those in the base-price Case 1 file.
- b. Please explain the discrepancies between the gas prices listed in Attachment 1 (as described immediately above) and [REDACTED]. Please state which fuel price assumptions were used in Power System Optimizer.

- 2.29. Please refer to Exhibit SAW-1, sponsored by Stuart A. Wilson, at page D-3, and Table 10 at page D-18.
- a. With reference to Table 10: please confirm that the capacity cost used to calculate the target reserve margin was \$73.90/kW-year. If not, please state the capacity cost used.
- 2.30. Please refer to Exhibit SAW-1, sponsored by Stuart A. Wilson, Table 14 at page D-23 and Table 15 at page D-24.
- a. Please confirm that the Reference Portfolio described in row 1 of Table 14 plus 480 MW of SSCT exceeds the target summer and winter reserve margin. With reference to Table 15, please confirm that your analysis shows that the loss-of-load-expectation (LOLE) of that portfolio is 3.87 days in 10 years (or, if not, please state the LOLE of that portfolio).
  - b. Please confirm that the LOLE analysis shows that the Reference Portfolio with supply additions to meet the 17% and 24% target reserve margin would yield an LOLE reliability metric more than three times worse than the 1-in-10 guideline set by NERC. If not, please state what the LOLE is at the 17% and 24% target reserve margins.
- 2.31. Please refer to the Attachment in response to question 53(f) of the Commission Staff's first Request for Information, available at: [https://psc.ky.gov/pscecf/2022-00402/rick.lovekamp%40lge-ku.com/03102023102544/07-PSC DR1 LGE KU Attach to Q53%28f%29 - Peak Demand and Resource Summary.pdf](https://psc.ky.gov/pscecf/2022-00402/rick.lovekamp%40lge-ku.com/03102023102544/07-PSC_DR1_LGE_KU_Attach_to_Q53%28f%29_-_Peak_Demand_and_Resource_Summary.pdf).
- a. Please confirm that the summer reserve margin for the proposed resource portfolio ranges from 40.7% in 2027, the year proposed for the first NGCC addition, to no lower than 36.4% through 2050. If not, please provide the calculation for the summer reserve margin, explain how it is different from the value in the referenced Attachment, and provide the summer reserve margins of the proposed resource portfolio that correspond to each year from 2023 through 2050.
  - b. Please explain why a reserve margin above the 17% summer target has been selected.
  - c. The reserve margin analysis in the 2021 Integrated Resource Plan found that a 24% summer reserve margin was required to meet a 1-in-10 LOLE.<sup>3</sup> Please explain whether the Companies selected a reserve margin above that needed to reach 1-in-10, and if so how much higher, and why.

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<sup>3</sup> LG&E-KU, "2021 IRP Resource Screening Analysis", at page 4, (Oct. 2021), available at [https://psc.ky.gov/pscecf/2021-00393/rick.lovekamp%40lge-ku.com/10192021013101/5-LGE KU 2021 IRP Volume III.pdf](https://psc.ky.gov/pscecf/2021-00393/rick.lovekamp%40lge-ku.com/10192021013101/5-LGE_KU_2021_IRP_Volume_III.pdf).

- 2.32. Please refer to the Direct Testimony of Stuart A. Wilson, Table 5 at 23:
- a. Please confirm that the 30.1% summer reserve margin and 28.4% winter reserve margin listed in Table 5 in the row “Portfolio 1: MC5 & BR12” in the section “Total Reserve Margin” corresponds to the reserve margins for the portfolio selected by the Plexos capacity expansion model. If not, please describe the origin of Portfolio 1, and please state the reserve margin that corresponds to the portfolio that Plexos selected.
  - b. Please state whether the Plexos model exceeded its capacity requirement in 2028. If so, please explain why.
  - c. The reserve margin analysis in the 2021 Integrated Resource Plan found that a 24% summer reserve margin was required to meet a 1-in-10 LOLE.<sup>4</sup> Please state whether the 2022 analysis for the CPCN has yielded an updated value for the summer and winter reserve margins needed to meet 1-in-10 LOLE, and if so, please state those reserve margins.
- 2.33. Refer to the Companies’ response to Joint Intervenors’ Request for Information 1-1 and accompanying attachments. Confirm that the Attachments to Q1-1(c) include all documents evaluating the economic or technical feasibility of converting any of the Companies’ coal-fired units (including units at Brown, Mill Creek, and Ghent) to burn gas. If not confirmed, please provide all such analyses.
- 2.34. Refer to the Companies’ response to Joint Intervenors’ Request for Information 1-1, Attachment 6, CO2 Reduction Alternatives, at page 11.
- a. Please provide all documents supporting the referenced costs of converting the Companies’ coal units to gas.
  - b. Do the costs listed on page 11 include costs of modifying the boilers or units to burn gas? If not, please provide those costs and all supporting documentation.
- 2.35. Please see the statement in footnote 3 on page 9 of the Companies’ application that “Capacity values reflect 78.6% expected contribution to summer peak capacity and 0% expected contribution to winter peak capacity.”
- a. Please provide the worksheets, with formulae intact, that were used to determine solar’s capacity value contribution.
  - b. Please confirm what capacity value assumptions were used for solar in the Companies’ Plexos modeling.

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<sup>4</sup> LG&E-KU, “2021 IRP Resource Screening Analysis”, at page 4, (Oct. 2021), *available at* [https://psc.ky.gov/psccef/2021-00393/rick.lovekamp%40lge-ku.com/10192021013101/5-LGE KU 2021 IRP Volume III.pdf](https://psc.ky.gov/psccef/2021-00393/rick.lovekamp%40lge-ku.com/10192021013101/5-LGE%2021%20IRP%20Volume%20III.pdf).

2.36. Please refer to the Companies' response to the Commission Staff's First Request for Information, No. 94, stating, "None of the evaluated solar asset projects meet the requirements for the Energy Community Bonus." Please confirm whether this statement remains true in light of the release of the U.S. Department of Energy's Energy Community Tax Credit Bonus map. If not, please state which evaluated solar asset projects meet the requirements.<sup>5</sup>

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<sup>5</sup> See Interagency Working Group on Coal & Power Plant Communities & Economic Revitalization, *Energy Community Tax Credit Bonus*, <https://energycommunities.gov/energy-community-tax-credit-bonus/>.