COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2024 JOINT INTEGRATED RESOURCE PLAN OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY	)	**Case No. 2024-00326**

SIERRA CLUB'S INITIAL REQUESTS FOR INFORMATION TO LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY

Sierra Club hereby submits this First Set of Data Requests to Louisville Gas and Electric Company and Kentucky Utilities Company (collectively referred to as "LG&E/KU" or the "Companies"). Please provide responses to these data requests below to the undersigned counsel.

GENERAL INSTRUCTIONS

1) **Definitions:** For the purposes of these data requests, the following definitions shall apply:

a) The term "LGE/KU" means and includes Louisville Gas and Electric Company and Kentucky Utilities Company and any and all affiliates and/or subsidiaries, successors, predecessors, agents, consultants, and witnesses in this proceeding, and any and all of their affiliates, subsidiaries, or predecessors.

b) The term "Companies" means and includes Louisville Gas and Electric Company and Kentucky Utilities Company and any and all affiliates and/or subsidiaries, successors, predecessors, agents, consultants, and witnesses in this proceeding, and any and all of their affiliates, subsidiaries, or predecessors.

c) "Document" means all written, recorded or graphic matters, however produced or reproduced, pertaining in any manner to the subject of this proceeding, whether or not now in existence, without limiting the generality of the foregoing, all

originals, copies and drafts of all writings, correspondence, telegrams, notes or sound recordings of any type of personal or telephone communication, or of meetings or conferences, minutes of directors or committee meetings, memoranda, inter-office communications, studies, analyses, reports, results of investigations, reviews, contracts, agreements, working papers, statistical records, ledgers, books of account, vouchers, bank checks, x-ray prints, photographs, films, videotapes, invoices, receipts, computer printouts or other products of computers, computer files, stenographer's notebooks, desk calendars, appointment books, diaries, or other papers or objects similar to any of the foregoing, however denominated. If a document has been prepared in several copies, or additional copies have been made, and the copies are not identical (or which, by reasons of subsequent modification of a copy by the addition of notations, or other modifications, are no longer identical) each non-identical copy is a separate "document."

d) "And" or "or" shall be construed conjunctively or disjunctively as necessary to make the requests inclusive rather than exclusive.

e) The terms "you" and "your" refer to "LG&E/KU."

f) The term "person" means any natural person, corporation, corporate division, partnership, limited liability company, other unincorporated association, trust, government agency, or entity.

g) The term "regarding" means consisting of, containing, mentioning, suggesting, reflecting, concerning, regarding, summarizing, analyzing, discussing, involving, dealing with, emanating from, directed at, pertaining to in any way, or in any way logically or factually connected or associated with the matter discussed.

h) The singular as used herein shall include the plural and the masculine gender shall include the feminine and the neuter.

i) "Identify" or "identifying" or "identification" when used in reference to a person that is a natural person means to state: the full name of the person and any names under which he conducts business; the current employer of the person, the person's job title and classification, the present or last known work address of the person; and, the present or last known telephone number of the person.

j) "Identify" or "identifying" or "identification" when used in reference to a person other than a natural person means to state: the full name of the person and any names under which it conducts business; the present or last known address of the person; and, the present or last known telephone number of the person.

k) "Identify" or "identifying" or "identification" when used in reference to a document means to provide with respect to each document requested to be identified by these discovery requests a description of the document that is sufficient for purposes of a request to produce or a subpoena duces tecum, including the following:

(a) the type of document (e.g., letter, memorandum, etc.);

(b) the date of the document;

(c) the title or label of the document;

(d) the Bates stamp number or other identifier used to number the document for use in litigation;

(e) the identity of the originator;

(f) the identity of each person to whom it was sent;

(g) the identity of each person to whom a copy or copies were sent;

(h) a summary of the contents of the document;

(i) the name and last known address of each person who presently has possession, custody or control of the document; and,

(j) if any such document was, but is no longer, in your possession, custody or control or is no longer in existence, state whether it: (1) is missing or lost; (2) has been destroyed; or (3) has been transferred voluntarily or involuntarily, and if so, state the circumstances surrounding the authorization for each such disposition and the date of such disposition.

l) "Identify" or "identifying" or "identification" when used in reference to communications means to state the date of the communication, whether the communication was written or oral, the identity of all parties and witnesses to the communication, the substance of what was said and/or transpired and, if written, identify the document(s) containing or referring to the communication.

m) "Current" when used in reference to time means in the present time of this data request.

n) "Customer" means a person or company (residential, commercial, or industrial) who buys retail electricity on a regular and ongoing basis from LG&E/KU.

o) "Workpapers" are defined as original, electronic, machine-readable, unlocked, Excel format (where possible) with formulas in-tact.

OTHER INSTRUCTIONS

a) Responses are to be provided in electronic format (e.g., text documents should be in the original word processor file format or PDF, data files should be in Excel).

b) If you contend that any response to any data request may be withheld under the attorney-client privilege, the attorney work product doctrine or any other privilege

or basis, please state the following with respect to each such response in order to explain the basis for the claim of privilege and to permit adjudication of the propriety of that claim:

1) The privilege asserted and its basis;

2) The nature of the information withheld; and,

3) The subject matter of the document, except to the extent that you claim it is privileged.

c) For any document or set of documents LG&E/KU objects to providing to Sierra Club on the grounds it is burdensome or voluminous, please identify the specific document (see instruction (k) above).

d) These data requests are to be answered with reference to all information in your possession, custody or control or reasonably available to you. These data requests are intended to include requests for information, which is physically within your possession, custody or control as well as in the possession, custody or control of your agents, attorneys, or other third parties from which such documents may be obtained.

e) If any data request cannot be responded to or answered in full, answer to the extent possible and specify the reasons for your inability to answer fully.

f) These data requests are continuing in nature and require supplemental responses should information unknown to you at the time you serve your responses to these data requests subsequently become known.

g) For each response, identify all persons (see instruction (j)) that were involved in the preparation of the answers to the interrogatories below and/or are responsible for compiling and providing the information contained in each answer.

h) Identify which witness(es) at the hearing is competent to adopt and/or discuss the response.

i) Please produce the requested documents in electronic format to the following individuals:

Kristin Henry
kristin.henry@sierraclub.org

Nathaniel Shoaff
nathaniel.shoaff@sierraclub.org

Joaquin Garcia
joaquin.garcia@sierraclub.org

j) Wherever the response to an interrogatory or request consists of a statement that the requested information is already available to the Sierra Club, provide a detailed citation to the document that contains the information. This citation shall include the title of the document, relevant page number(s), and to the extent possible paragraph number(s) and/or chart/table/figure number(s).

k) 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.

l) Sierra Club reserves the right to serve supplemental, revised, or additional discovery requests as permitted in this proceeding.

DATA REQUESTS

1-1. Provide all LG&E/KU responses to data requests from all parties in this proceeding, including confidential responses. Continue to provide any such documentation, until this docket is closed, on a regular basis.

1-2. To the extent not already provided, please provide any redacted documents included in the Companies' initial filing in non-redacted, electronic versions (machine readable, unprotected, with formulas intact).

1-3. Please provide supporting workpapers and modeling files, including (not limited to) all input files, output files, and pre- or post-processing of said inputs and outputs for all portfolios and scenarios for all years modeled, in electronic spreadsheet format with formulas intact, supporting each of the statements, testimonies, exhibits, and attachments included in the Cooperative's initial filing and direct testimonies.

1-4. For all PLEXOS modeling runs referenced in the IRP filing, please provide the following:

a. The PLEXOS database (.xml).
b. The zipped output solution files for each run and associated portfolio containing the log files and other relevant output.
c. The settings that the Companies used within PLEXOS for the capacity expansion modeling, including the step size, chronology, duration curve, blocks in each duration curve, and slicing method.
d. The planning period over which the capacity expansion modeling was conducted.

1-5. For the PLEXOS capacity expansion modeling performed in PLEXOS, please answer the following:

a. Please explain if the capacity expansion plans were optimized to meet a summer reserve margin, a winter reserve margin, or both a summer and winter reserve margin, and how the Company did so.
b. Please confirm if the Companies are modeling the thermal resources on a UCAP or ICAP basis.
c. Please provide the supporting workbooks, with all formulas and links intact, used to develop the summer and winter capacity contributions modeled for the existing and new thermal resources.

1-6. If they have not been previously provided, please provide all SERVM files necessary to execute runs within the SERVM software, including the SERVM .bak file, the SERVM release, and the executable file.

1-7. Please refer to page 5-9 of the IRP.
a. Please provide the PROSYM input and output modeling files for each resource portfolio modeled.
b. Please provide the Financial Model supporting workbook, with all formulas and links intact, used to develop the costs for each of the resource portfolios modeled.
c. Please provide the present value of revenue requirements ("PVRR") results for each of the modeling runs performed for this IRP.

1-8. Please refer to pages 5-9 to 5-10 of the IRP where it states "the Companies produced 51 hourly load forecasts for 2032 based on weather in each of the last 51 years (1973-2023)."
a. Please explain the process the Companies used to develop the 51 hourly load forecasts.
i. If the Companies are using a neural network approach to develop the historical hourly profiles, please provide the historical years that are used to develop the neural network.
b. Please provide the supporting analysis, including any workbooks, with all formulas and links intact, used to develop the 51 hourly load forecasts.
c. Please explain why the Companies chose to model the last 51 year instead of some smaller number of weather years.

1-9. Please refer to page 5-11 of the IRP and the four environmental regulation scenarios.
a. For each of the Companies' existing coal-fired units, please provide the capital and O&M costs projected to be incurred each year to comply with the Effluent Limit Guidelines ("ELG").
b. Please provide the supporting analysis and workbooks, with all formulas and links intact, used to develop the costs to comply with ELG.
c. Please explain how the Companies evaluated the cost of ELG compliance in the PLEXOS capacity expansion modeling.

1-10. Please refer to page 5-15 of the IRP. Please provide the supporting workbooks, with all formulas and links intact, used to develop the Low, Mid, and High Load Scenarios.

1-11. Please refer to page 5-16 of the IRP where it references 1,050 MW of data center load by 2032 in the Mid scenario and 1,750 MW of data center load in the High scenario.

a. Please provide the supporting calculations, with all formulas and links intact, used to develop the assumption of 1,050 MW of data center load by 2032 in the Mid scenario and 1,750 MW in the High Scenario.
b. Please explain how the data center load assumptions for the Mid and High load scenarios compare to the level of requests the Companies have received from potential new customers.
c. Please explain what assumptions the Companies made around the hourly shape used to include the data center load in the load forecasts modeled in PLEXOS and ProSym.

1-12. Please refer to pages 5-16 and 5-17 if the IRP and the discussion of the three economic development load growth scenarios. For each scenario, please provide the following information:

a. The number of new customers included in the forecast.
b. For each new customer included in the load forecast, please provide the peak demand, ramp schedule, annual energy requirements, load factor, hourly shape, anticipated date the customer expects to receive service, the commercial activity of the customer (i.e. data center, cryptocurrency, or EV manufacturing), and whether the customer has entered into any agreements or contracts with the Companies.
c. For each new customer that has executed an agreement indicating an intention to obtain service from the Companies, please provide the date of the agreement.
    i. The service agreement signed by the customer;
    ii. If agreement(s) have not been executed, please explain if any of the new customers are considering locating their facility outside of the Companies' service territory or in another state.
d. Please give the new customers, by size, that have commenced site construction activities.
e. Please detail the conversations, if any, that the Companies have had with new customers about arrangements for curtailable load, standby on-site generation, behind the meter generation, participation in energy efficiency programs, or any other approaches to offset the capacity need of the new customers.
f. For the potential new customers that the Companies have engaged in conversations with, please confirm if any of those customers have made modifications to the announced load or ramp schedule. If yes, please provide the initial numbers provided to the Companies and modifications made by the

customer.

1-13. Please refer to page 5-17 of the IRP where it states "The Companies assign a low likelihood to the Low Scenario".
   a. Please explain what this statement means to the Companies.
   b. Please explain if this means that the Companies applied probabilities or any stochastic modeling to the load forecasts modeled.

1-14. Please refer to Figure 5-8 on page 5-17 of the IRP. Please provide the supporting workbook, with all formulas and links intact, used to develop Figure 5-8.

1-15. Please refer to page 5-18 of the IRP where it states "the Companies' Mid load forecast includes nearly 1,500 GWh of reductions by 2032 from customer-initiated energy efficiency improvements, AMI-related conservation load reduction and ePortal savings, distributed generation, and the energy efficiency effects of the Companies' proposed 2024-2030 DSM-EE Program Plan as well as new programs beyond 2030. These reductions are in addition to significant reductions observed historically from customers' actions to use electricity more efficiently."
   a. Please explain how the Companies developed the DSM-EE savings beyond the proposed 2024-2030 DSM-EE Program plan.
   b. Please explain what programs are included in the "new programs beyond 2030" and provide the breakdown of assumed energy and summer and winter peak savings by program.
   c. Please provide the supporting workbooks, with all formulas and links intact, used to develop the costs included in the financial modeling for each of the DSM and EE programs included in the resource portfolios.

1-16. Please refer to Figure 5-9 on page 5-19 of the IRP.
   a. Please provide the supporting workbook, with all formulas and links intact, used to develop Figure 5-19.
   b. Please explain how energy efficiency savings were modeled in PLEXOS and ProSym.
      i. If the energy efficiency savings were modeled as a reduction to the load forecast, please provide the 8,760 hourly shape that was used to develop hourly energy efficiency savings.
   c. Please confirm that this was the only level of energy efficiency savings modeled in the resource portfolios. If not confirmed, please explain what other levels of energy efficiency savings were evaluated.
   d. Please explain how existing DSM programs were incorporated into the load forecast, (i.e. were savings from historical programs added back to the load forecast to get a "no DSM" forecast or was a DSM variable included as an independent variable in the regression model).

1-17. Please refer to Figure 5-10 on page 5-20 of the IRP. Please provide the supporting workbook, with all formulas and links intact, used to develop Figure 5-10.

1-18. Please refer to Figure 5-11 on page 5-21 of the IRP.
   a. Please provide the supporting workbook, with all formulas and links intact, used to develop Figure 5-11.
   b. Please provide the annual summer and winter peak and energy impacts from electric vehicle load included in the load forecast.
   c. Please provide the total annual number of electric vehicles assumed in the Companies' load forecast for each year in the forecast period.
   d. Please provide the EV load shape assumed for the Low, Mid, and High forecast broken out by light-, medium- and heavy-duty vehicles.
   e. Please provide the hourly charging profile the Companies assumed in each forecast.
   f. Please provide the historical charging profiles for EVs in the Companies' service territory.

1-19. For the DSM-EE programs included in the IRP, please answer the following:
   a. Please identify each DSM-EE program evaluated for implementation during the planning period and provide the data and analysis used to evaluate each such DSM-EE program.
   b. Please provide the Companies' most recent study of demand response and energy efficiency potential among each of the customer classes.
   c. Please provide the most recent three full years of reported DSM-EE data (including program planned budgets and savings, actual spending and savings, and planned and actual participation) by program, in executable Excel format with formulae intact. Please also provide any energy efficiency or demand response Annual Reports prepared during this period.
   d. Please provide the measure life and measure savings for each of the existing DSM programs.
   e. Please explain the companies' cost benefits analyses of DSM programs (including energy efficiency programs).
   f. Please provide all data and analysis performed regarding all DSM programs considered for implementation during the planning period. Please include all Benefit-Cost analyses and all cost tests utilized for each program and identify each program that was evaluated.
   g. Please explain if the cost benefit analyses include potential avoided transmission or distribution investments? If not, why not?
      i. If the analyses did include potential avoided transmission or distribution investments, please provide the value of the avoided transmission or

distribution investments.

1-20. Please refer to Figures 5-12 through Figure 5-14 of the IRP. Please provide the supporting workbooks, with all formulas and links intact, used to develop Figures 5-12, Figure 5-13, and Figure 5-14.

1-21. Please refer to Table 6-4 on page 6-5 of the IRP.
   a. Please provide the supporting workbook, with all formulas and links intact, used to develop the numbers presented in Table 6-4.
   b. Please provide the source of the capital costs reported for each technology included in Table 6-4.
   c. Please explain if the capital costs reported for each technology include the costs for transmission.
      i. If transmission costs are included, please provide the transmission costs modeled for each technology type.
   d. Please provide the firm gas transportation costs assumed for the SCCT and NGCC resources.
   e. Please confirm if the $2,049/kW capital cost reported in the 2024 IRP column for 4-hr BESS is before or after the inclusion of the Investment Tax Credit ("ITC").
   f. Please provide the ITC value that was applied to the solar and battery storage resources.
   g. Please explain if the Companies assumed any level of the solar or battery storage resources modeled in PLEXOS would qualify for the 10% community bonus adder.
      i. If the Companies did not make any assumption for the community bonus adder, please explain why not.
   h. Please explain if the Companies assumed any level of the solar or battery storage resources modeled in PLEXOS would qualify for the 10% domestic content bonus adder.

1-22. Please refer to Figures 7-14 and 7-15 on page 7-30 of the IRP. Please provide the supporting workbooks, with all formulas and links intact, used to develop Figure 7-14 and 7-15.

1-23. Please refer to Section 2.2 in the 2024 IRP Technology Update at pages 11-13.
   a. Please provide the supporting workbooks, with all formulas and links intact, used to develop the analysis of computing the cost of replacing Mill Creek 3's generation with renewables and BESS in the Excel model referenced on page 11.
   b. Please provide the source that the Companies used to develop the solar and wind hourly profiles.

1-24. Please refer to footnote 49 on page 20 of the 2024 IRP Technology Update. Please provide a copy of the study referenced in this link.

1-25. Please refer to the 2024 IRP Technology Update at page 20 where it states: "For the Resource Assessment, the Companies have allowed for maximizing renewables penetration in the study period by limiting solar generation to 20% of total energy requirements and the sum of solar and wind generation to 25% of total energy requirements".

a. Please explain how this limit translated into the build limits modeled in PLEXOS.
b. Please provide the annual build limits applied to solar and wind resources in PLEXOS.

1-26. Please refer to pages 28 – 30 in the Direct Testimony of Witness David Sinclair in Case No. 2022-00402 and page 23 of the 2024 IRP Technology Update.

a. On pages 28 – 30 of Witness Sinclair's testimony, Witness Sinclair discusses the pumped hydro facility that was bid into the RFP and reported that "the proposal was viewed as not far enough along in its development to be a viable resource to address the timing of the Companies' current energy and capacity needs." Please explain if the Companies are aware of any updates regarding the development of the resource that was bid into the RFP.
    i. If there have been updates on the development of the resource, please explain why pumped hydro was not considered as a resource in the IRP modeling.

1-27. Please refer to the 2024 IRP Resource Adequacy Analysis at page 4 where it states: "Importantly, like in prior reserve margin analyses, these reserve margins were developed with the assumption that the Companies can purchase power from TVA, PJM, or MISO when generation and transmission capacity are available."

a. Please provide the assumption that was modeled in SERVM for the interchange between the Companies and TVA, PJM, and MISO.
b. Please explain how the interchange assumptions were developed.
c. Please provide the Companies' historical hourly purchases and sales separated out for TVA, PJM, and MISO, for the past five years.

1-28. Please refer to Figure 2 and Figure 3 on page 7 of the 2024 IRP Resource Adequacy Analysis. Please provide the supporting workbooks, with all formulas and links intact, used to develop Figure 2 and Figure 3.

1-29. Please refer to page 17 of the 2024 IRP Resource Adequacy Analysis and the discussion of the "High ATC" case.

a. Based on the results from this case, are the Companies planning on pursuing the "Approximately $101 million per year plus losses to have a minimum of 700 MW of ATC at all times"?
    i. If the Companies do pursue the "High ATC" case, in what year would the Companies be able to secure the 700 MW of ATC at all times?

1-30. Please refer to page 18 of the 2024 IRP Resource Adequacy Analysis.
a. Please explain if the 85%, 93% and 29% capacity contributions for 4-hour BESS, 8-hour BESS, and dispatchable DSM, remain constant throughout the planning horizon at these values. If not, please provide the capacity contributions modeled across the planning period.
b. For the 300 MW of dispatchable DSM modeled to determine the 39% contribution, please explain how the 300 MW of dispatchable DSM was modeled in SERVM, including limits or constraints on when the resource could be dispatched.

1-31. For the SERVM modeling conducted and discussed in the 2024 IRP Resource Adequacy Analysis, please answer the following:
a. Please explain how the Companies included the forecasted economic development load in their hourly historical load profiles and projected peak demand and energy in SERVM.
b. Please explain how the Companies included the forecasted electric vehicle load in their hourly historical load profiles and projected peak demand and energy in SERVM.
c. Please explain how the Companies included the forecasted energy efficiency savings in their hourly historical load profiles and projected peak demand and energy in SERVM.
d. Please explain if the Companies performed any analysis in SERVM that did not include the projected economic development load.
    i. If any studies were performed, please provide the SERVM modeling outputs for those studies.

1-32. Please refer to page 23 of the 2024 IRP Resource Adequacy Analysis where it states: "For each unit, the scenarios are developed to target the annual EFOR values in Table 14, which are based on the medians of historical EFORs from 2009 to 2024."
a. Please provide the EFOR for each of the Companies' generating units between 2009 and 2024.
b. Please provide the supporting workbooks, with all formulas and links intact, used to develop the outage distributions modeled in SERVM for each of the thermal generators.

1-33. Please refer to page 23 of the 2024 IRP Resource Adequacy Analysis where it states: "In developing these annual EFOR values, the Companies updated their analysis from the

2022 CPCN proceedings to compute the correlation between forced outages and temperature over this same time period (2009-2024).” Please provide the supporting workbooks, with all formulas and links intact, used to develop the analysis that computed the correlation between forced outages and temperature.

1-34. Please refer to page 23 of the 2024 IRP Resource Adequacy Analysis where it states, “For each neighboring region, Astrapè added a negative generating unit with higher output at lower temperatures to model the effects of correlated outages.”

a. Please confirm if this means that the neighboring regions configured in the SERVM studies performed by the Companies include the negative generating unit.
b. Please confirm that the negative generating unit modeled in the neighboring regions is representative of additional forced outages from lower temperatures.
c. Please explain how the size of the negative generating unit was determined for each of the neighboring regions.
d. Please provide the supporting analysis and any workbooks, with all formulas and links intact, used to develop the correlation between forced outages and temperature in the neighboring regions modeled in SERVM.

1-35. Please refer to pages 25 to 26 of the 2024 IRP Resource Adequacy Analysis where it states that “the Companies can curtail CSR customers only in hours when more than ten of the Companies’ large-frame SCCTs are being dispatched, the ability to utilize this program is limited.” Please explain how this limit was modeled in SERVM.

1-36. Please refer to Table 18 on page 27 of the 2024 IRP Resource Adequacy Analysis. Please provide the supporting workbooks, with all formulas and links intact, used to develop Table 18.

1-37. Please refer to page 5 of the 2024 IRP Resource Assessment. Please provide the supporting workbooks, with all formulas and links intact, used to develop the five fuel price scenarios.

1-38. Please refer to page 14 of the 2024 IRP Resource Assessment where it states: “Specifically, the Companies added constraints in PLEXOS to ensure (for cases where coal unit retirements are economic) that coal units are replaced over the analysis period by an equal or greater amount of fully dispatchable resources.” Please explain which new resources were allowed to be selected within PLEXOS to meet this constraint.

1-39. Please refer to Table 32 on page 55 of the 2024 IRP Resource Assessment.

a. Please provide the pipeline modifications that are included in the co-firing and gas conversion capital column for each of the units.
b. Please provide the firm gas transportation cost modeled for each of the coal to gas conversions shown in Table 32.

c. Please provide the source of the conversion costs.

1-40. Please describe LG&E/KU's load interconnection queue process and answer the following:

a. What criteria or requirements, if any, do potential large load customers have to meet for entry to LG&E/KU's load interconnection queue?
b. What data sharing requirements does LG&E/KU have in place for large load customers to describe their operational characteristics, both in terms of steady-state and dynamic performance?
c. What transmission studies does LG&E/KU conduct of a potential, new large load customer?
d. What is the transmission study process for large load customers? Is a serial or cluster study approach used? What specific studies (powerflow, contingency analysis, transient stability, EMT, etc.) are conducted for large loads? What size thresholds or other criteria, if any, are used to differentiate the types of studies performed?
e. What information is required/requested to develop a load model representation in powerflow, positive sequence dynamics, and EMT? Does LG&E/KU require the large load customer to provide a dynamic model? Does LG&E/KU require the provision of any information that would help inform the creation of a dynamic load model? If so, do all potential, new large load customers provide this data?
f. If LG&E/KU does not receive dynamic load data from a potential, new large load customer, what assumptions with respect to the load of the potential customer does LG&E/KU make when conducting EMT and/or transient stability studies?
g. What requirements, if any, does LG&E/KU impose on the length of time in which a customer can remain in its load interconnection queue?
h. Provide a copy of any contracts that govern the recovery of transmission study costs from potential large load customers.
i. What types of power flow cases and scenarios does LG&E/KU run when assessing the impacts of new large load customers?
j. How are new large load customers grouped, if at all, for purposes of transmission planning studies?
k. What information serves as the basis for the commitment and dispatch represented in LG&E/KU's transmission modeling?
l. What assumption does LG&E/KU make with respect to imports/exports of energy to or from its transmission system for purposes of power flow simulations as part of its large load interconnection planning process?
m. Does LG&E/KU have any restrictions or requirements in place regarding fast ramping of large load customers such as AI data center loads that could impact bulk power system conditions?
n. Does LG&E/KU have documented criteria for assessing what is considered acceptable versus unacceptable performance of the bulk power system when

studying the reliability impacts of large load interconnection requests? If so, please provide those criteria.

o. What is the process and criteria for incorporating large load interconnection requests into load forecasts used for integrated planning, resource planning, transmission planning, etc.?

1-41. Please refer to the workbook named "20240901_RevenueRequirementProfiles_2024IRP_0328," worksheet named "RR," and rows labeled "% of Option 1 Ownership for ITC Normalization," "ITC Normalization," and "ITC Normalization Opt-Out."

a. Please explain how the information in worksheet "RR" is used to model new resource options in PLEXOS.

b. Please explain if the Companies are assuming that the Investment Tax Credit ("ITC") is taken as a reduction to the capital cost in the first year that the project is online or if the Companies are normalizing the ITC over the project life.

i. If normalized, please explain the Companies' justification for this assumption.

1-42. With respect to the Mercer and Marion County solar facilities, please answer the following:

a. Have either of these projects experienced a delay in projected in-service? If so, please explain the circumstances that have led to the delay.

b. Have either of these projects experienced increases in projected cost? If so, please give the increase and explain the circumstances that have led to the projected increase.

1-43. Page 3 of the Executive Summary of the IRP states: "The Companies' load forecasting process continues to account for important macroeconomic data, customer usage history and trends, and other energy usage drivers such as projected end-use efficiency and saturation data (e.g., the saturation of high-efficiency heat pumps for residential customers)."

a. Please provide the specific assumptions related to saturation of high-efficiency heat pumps assumed in the load forecast.

b. Please explain what factors, in the Company's view, will lead to adoption of high-efficiency heat pumps over less efficient heat pumps.

c. Have the Companies explored the possibility of incentivizing high efficiency heat pumps within their service territories? If so, please provide the documents that summarize that assessment.

1-44. Page 5 of the Executive Summary of the IRP states: "The Companies' system is now consistently dual-peaking. Figure 3 above shows that the Companies' system peaks routinely occur in the winter, and the highest peaks in the last ten years have all occurred in the winter." Please provide any studies conducted in the past five years of the factors that have led to winter peaks occurring at levels similar to or higher than the Companies'

summer peaks.

1-45. Please provide the workbook with all formulas and links intact used to create Table 2 of the Executive Summary.

1-46. Page 5-10 of the IRP states: "electric heating systems consume significantly more energy during extreme cold weather when the need for backup resistance heating is triggered." With respect to this statement please answer the following:

a. Does this statement apply exclusively to heat pump-based heating or to other heating appliances as well? If yes, to which does the statement apply?
b. What information do the Companies have, if any, about the temperature at which resistance heating is triggered?
c. How many customers, in the Companies' estimation, and across which customer classes would experience a triggering of resistance heating during cold weather?

1-47. Please refer to Tables 7-25 and 7-26. For each year, please provide the estimated electric heating penetration broken down by equipment type.

1-48. Page 7-38 of the IRP states: "The addition of AMI will provide a valuable source of data to understand residential end-use trends. Thus far, AMI data has been used to analyze impacts of Winter Storm Elliot and direct load control events." Please provide any studies, slidedecks, or other materials that relate to the uses of AMI data referred to in these sentences.

1-49. Please refer to page 8-10 of the IRP. When does the Company anticipate starting a VVO program? How many circuits does the Company intend to initially treat with VVO?

Dated: November 22, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

This is to certify that the foregoing copy of Sierra Club's Initial Requests for Information to Louisville Gas and Electric Company and Kentucky Utilities Company in this action is being electronically transmitted to the Commission on November 22, 2024, and that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding.

/s/ Joe F. Childers
JOE F. CHILDERS