COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC INVESTIGATION OF	**)**	
LOUISVILLE GAS AND ELECTRIC	**)**	
COMPANY AND KENTUCKY	**)**	**CASE NO. 2023-00422**
UTILITIES COMPANY SERVICE	**)**	
RELATED TO WINTER STORM	**)**	
ELLIOTT	**)**	

RESPONSE OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY TO THE JOINT MOTION OF METROPOLITAN HOUSING COALITION, KENTUCKIANS FOR THE COMMONWEALTH, KENTUCKY SOLAR ENERGY SOCIETY, AND MOUNTAIN ASSOCIATION'S SUPPLEMENTAL DATA REQUESTS

DATED MARCH 1, 2024

FILED: March 15, 2024

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Lonnie E. Bellar**, being duly sworn, deposes and says that he is Senior Vice President Engineering and Construction for PPL Corporation and he provides services to Louisville Gas and Electric Company and Kentucky Utilities Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Lonnie E. Bellar

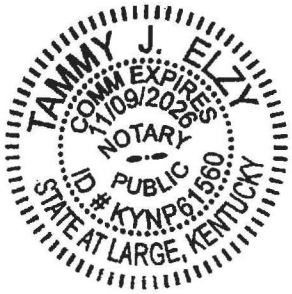
Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13th day of March 2024.

Notary Public

Notary Public ID No. KYNP61560

My Commission Expires:

November 9, 2026



VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Charles R. Schram**, being duly sworn, deposes and says that he is Director – Power Supply for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Charles R. Schram

Charles R. Schram

Subscribed and sworn to before me, a Notary Public in and before said County and State this 13th day of March 2024.

Caroline J. Davison

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **David S. Sinclair**, being duly sworn, deposes and says that he is Vice President, Energy Supply and Analysis for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13th day of March 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Stuart A. Wilson**, being duly sworn, deposes and says that he is Director, Energy Planning, Analysis & Forecasting for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Stuart A. Wilson

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13th day of March 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

CAROLINE J. DAVISON
COMM EXPIRES 01/22/2027
NOTARY PUBLIC
ID # KYNP63286
STATE AT LARGE, KENTUCKY

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
Dated March 1, 2024

Case No. 2023-00422

Question No. 2.1

Responding Witness: Lonnie E. Bellar

Q-2.1. Please refer to the Companies' response to Joint Intervenors' Request No. 1-2, paragraphs (e) and (f).

a. Is it the Companies' position that they are not seeking to add additional transmission tie lines, or only that any such construction would not require Commission approval under 807 KAR 5:120? Please explain your answer.

b. Do the Companies believe that additional transmission tie lines are needed? Please explain why or why not.

c. Do the Companies believe that additional transmission tie lines would improve reliability on their system? Please explain why or why not.

A-2.1.

a. The Companies are not currently seeking to add any additional transmission tie lines. However, the Companies are continuously evaluating whether new interconnections are necessary or appropriate to improve or maintain the reliability of the Companies' transmission system as a part of the transmission planning process. Since 2013 the Companies have completed six new transmission tie lines:
    - New LG&E/KU Matanzas 161/138kV substation – December 2013
        - LG&E/KU's Matanzas to BREC's Wilson 161kV
        - LG&E/KU's Matanzas to BREC's New Hardinsburg 161kV
    - New LG&E/KU Kenzig Road 345kV substation – May 2015
        - LG&E/KU's Kenzig Road to DEI's Speed 345kV
        - LG&E/KU's Kenzig Road to HE's Ramsey 345kV
    - New LG&E/KU West Shelby 69kV substation – December 2020
        - LG&E/KU's West Shelby to EKPC's Bekaert 69kV
    - New LG&E/KU Redmon Road 345kV substation – June 2022
        - LG&E/KU's Redmon Road to BREC's Otter Creek 345kV

Also, see the response to Question No. 2.5 part (a) for all new or upgraded interconnections with neighboring transmission systems the Companies have recommended since 2012 in the Transmission Expansion Plan ("TEP") process.

b. See the response to part (a) and part (c).

c. Generally, additional transmission tie lines may improve reliability of any transmission system, and the Companies are continuously evaluating potential new interconnections as part of the annual transmission planning study process. However, additional transmission tie lines are not always the most efficient or effective solution for -improving reliability. A list of the Companies' current 2024 TEP projects can be found in Attachment 2 of the 2024 Transmission Expansion Plan Report provided in the response to SC 1-37. The Companies 2024 TEP does not include any additional transmission tie lines but does include upgrades to four existing transmission tie lines.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
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Case No. 2023-00422

Question No. 2.2

Responding Witness: Lonnie E. Bellar / David S. Sinclair

Q-2.2. Please refer to the Companies' response to Joint Intervenors' Request No. 1-19. Please produce any analysis of future load and resources carried out or considered as part of the Companies' annual business planning process since Winter Storm Elliott.

A-2.2. The Companies' most recent business plan was initially developed in mid-2023 and assumed the proposed resources in Case No. 2022-00402 would be approved by the Commission. For example, the resource plan assumed the Brown 12 NGCC would be commissioned in 2028 and the Brown 3 and Ghent 2 coal units would be retired. Since the Commission issued its Order on November 6, 2023,[1] the Companies have not conducted additional resource modeling or analysis to account for the Order's impact. Instead, to account for the Commission's Order, the Companies updated their plan to assume Brown 12 would replace Brown 3 in 2030[2] and Ghent 2 would retire in 2034 (the end of its book depreciation life).[3] The Companies will conduct additional resource modeling and analysis as part of their 2024 Integrated Resource Plan ("IRP") to be filed later this year. See attached for the Companies' most recent hourly demand forecast, which is not materially different from the forecast evaluated in Case No. 2022-00402.

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[1] *See Electronic Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan and Approval of Fossil Fuel-Fired Generating Unit Retirements*, Case No. 2022-00402, Order (Ky. PSC Nov. 6, 2023).

[2] *Id*. at 137 ("The Commission reiterates that the denial of the CPCN for Brown 12 is wholly based on the Commission's finding that the construction of Brown 12 should be deferred with the construction beginning on a date that provides for an in-service date in 2030."). Note also that the Companies assumed Brown 3 would retire in 2030 because the Companies cannot operate Brown 3 and Brown 12 simultaneously without certain transmission upgrades.

[3] The same assumption (i.e., retiring the unit at the end of its depreciable life) is made for all other fossil resources.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
Dated March 1, 2024

Case No. 2023-00422

Question No. 2.3

Responding Witness: Lonnie E. Bellar / David S. Sinclair

Q-2.3. Please refer to the Companies' response to Joint Intervenors' Request No. 1-19(a)-(e). With regards to each of the resource options identified in 1-19(a)-(e), please state whether the Companies intend to evaluate the following as part of its 2024 IRP:

a. The role that each resource can play in each of (i) improving reliability, (ii) reducing peak demand, and (iii) reducing the chance of rolling blackouts or other load shedding events in the Companies' service territory. If so, please explain how you intend to evaluate the role for each resource. If not, please explain why not.

b. The role that each resource can play as part of a VPP. If so, please explain how the Companies intend to evaluate the role of each resource. If not, please explain why not.

c. The role that a VPP can play as a resource option to improve reliability, reduce peak demand, and reduce the chance of rolling blackouts or other load shedding events in the Companies' service territory. If so, please explain how you intend to evaluate the role of a VPP. If not, please explain why not.

A-2.3. The objective of the IRP process is to identify the set of resources (demand-side and supply-side) that meets a given reliability standard at the lowest reasonable cost. Therefore, all resources evaluated should improve reliability, reduce peak demand (or contribute to meeting it), and reduce the chance of unserved energy.

a. Except distributed solar plus batteries, the Companies will evaluate the economic and operating characteristics of these and other resources for the purpose of developing a portfolio of resources that reliably serves customers at the lowest reasonable cost. While the Companies' modeling will fully capture each resource's contributions to reliably serving customers in each scenario modeled, the IRP's primary focus will be on identifying optimal

resource portfolios and not on the contributions of particular resources. These contributions will depend in each scenario on the load being served, the composition of other resources in the portfolio, and other constraints.

Past modeling has shown that solar paired with battery storage is less valuable than battery storage and solar that operate independently, primarily because pairing solar with storage limits the availability of the battery. The Companies do not plan to evaluate distributed solar plus batteries for this reason.

b. The concept of a Virtual Power Plant ("VPP") is very broad and can incorporate a host of generation, demand response, and centralized control by either third parties or utilities. As it relates to the Companies' service area, the primary potential VPP technologies are distributed solar, customer-owned back-up natural gas and petroleum generators, Li-ion batteries, and demand response programs, some of which were just recently approved by the Commission and have not been implemented yet. Key issues that will need to be analyzed and addressed in contemplating a VPP plan include scale, resource availability, customer acceptance, customer performance obligations, and the cost of the technology to manage the VPP assets.

c. See preamble to this response and part (b).

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Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
Dated March 1, 2024

Case No. 2023-00422

Question No. 2.4

Responding Witness: Lonnie E. Bellar / Stuart A. Wilson

Q-2.4. Please refer to the Companies' response to Joint Intervenors' Request No. 1-19(d).

a. Please produce any cold weather plan that the Companies have for the Brown Solar facility. If no such plan exists, please explain why not.

b. Please explain and produce any documentation of the Companies' procedures for removing snow from the Brown Solar facility after snowfall occurs. If no such procedures exist, please explain why not.

c. Please identify what steps were taken to remove snow from the Brown Solar facility after the snowfall the night of January 14, 2024, and when such steps were taken. If no such steps were taken, please explain why not.

d. Please identify Brown Solar's output each of the days of December 22 through December 26, 2022.

e. Please produce any cold weather plan that the Companies intend to have for the Marion County and Mercer County solar facilities approved in the Companies' CPCN docket, 2022-00402.

f. Please explain and produce any documentation of the snow removal procedures that the Companies intend to institute at the Marion County and Mercer County solar facilities.

A-2.4. Note that JI 1-19(d) asked, "Please state whether the Companies have evaluated each of the following as options for improving reliability, reducing peak demand, and/or reducing the chance of rolling blackouts or other load shedding events during severe winter weather conditions such as those experienced during Winter Storm Elliott. … d. Distributed solar plus batteries." The point of the Companies' response, which showed the impact of snowfall on solar production at the fixed-tilt Brown Solar Facility, was to demonstrate how such conditions could affect

distributed solar production during conditions like those the request asked the Companies to consider. Snow cover is particularly pertinent for roof-mounted residential distributed solar facilities, where snow clearing is likely to be difficult and dangerous, and therefore is unlikely to occur.

a. The Brown Solar facility does not require actions to mitigate the effect of cold weather because it lacks mechanical equipment that cold tends to affect, e.g., mechanically actuated equipment or pneumatic controls. Therefore, the E.W. Brown Cold Weather Preparedness Plan does not address the solar facility. When the facility is covered by snow, the Companies' practice is to let the sun melt the snow. See the response to part (b).

b. The Companies have no such procedures. The Companies have not formally evaluated alternatives for manually removing snow from the more than 50-acre Brown Solar facility's 44,000 panels, but they believe the most efficient method for doing this is simply to let the sun melt the snow. Understanding the impact of snow on the maintenance and operation of a solar facility is an example of the learning opportunity associated with the Brown Solar facility. A formal analysis would require weighing the cost of bringing in outside snow removal labor, assuming it could be located and employed, against the value of the energy that could be generated post-snow removal. As an example of this calculation, even if a panel could be cleared in one minute, it would take approximately 733 hours to clear all 44,000 panels, and approximately 37 people working 10 hours per day could complete this job in two days. At $20 per hour for labor, the total cost of snow removal would be approximately $15,000. Beginning two days after the snowfall that occurred the night of 1/14/2024, the Companies estimate that snow caused Brown Solar to produce approximately 160 MWh less energy than it otherwise would have produced. Therefore, the estimated cost of snow removal labor in this case would be approximately $90/MWh, which exceeds the Companies' marginal cost of energy over the period when the facility was not fully available. See attachment being provided in a separate file for a summary of these calculations.

c. There were no steps taken to remove the snow. See response to part (b).

d. See attachment being provided in a separate file.

e. Negotiations are ongoing for the Marion County solar project Build Transfer Agreement ("BTA"), while the Mercer County solar project is nearing completion of the conceptual design phase to support the upcoming Engineering, Procurement, and Construction ("EPC") request for proposal. Both projects are in the conceptual design phase and development of a cold weather plan will be included in the detailed design phase of the project.

f. Plans to address adverse weather conditions will be included in the planning referenced in the Companies response to part (e).

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Dated March 1, 2024

Case No. 2023-00422

Question No. 2.5

Responding Witness: Lonnie E. Bellar

Q-2.5. Please refer to the Companies' response to Joint Intervenors' Requests No. 1-19(f) and (g), and No. 1-20(a).

a. Please identify any new or upgraded interconnections with neighboring transmission systems the Companies have recommended since 2012 in the TEP process.

b. For each recommended new or upgraded interconnection identified in response to subpart (a) of this request, please state whether such new or upgraded interconnection has been completed. If so, please state when it was completed. If not, please explain why not.

c. Please identify any new or upgraded facilities that have been identified as needed in the LG&E/KU Balancing Authority Area to mitigate constraints identified in the extreme weather/high load case analyzed as part of the annual TEP processes since 2012.

d. For each new or upgraded facility identified in response to subpart (c) of this request, please state whether such new or upgraded facility has been completed. If so, please identify when it was completed. If not, please explain why not.

e. Please state whether it is the Companies' position that increased interconnections to neighboring RTOs and/or Balancing Authorities would not have increased the amount of energy that could have been imported into the Companies' system during Winter Storm Elliott. If so, please explain the basis for that position and produce any analysis upon which that position is based.

f. Please state whether it is the Companies' position that new or upgraded transmission infrastructure within the Companies' Balancing Authority Area would not have increased the amount of energy that could have been imported

into the Companies' system during Winter Storm Elliott. If so, please explain the basis for that position and produce any analysis upon which that position is based.

A-2.5.

a. Attached is a table of all new or upgraded interconnections with neighboring transmission systems the Companies have recommended since 2012 in the TEP process. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

b. See the response and attachment to part (a). Any new or upgraded interconnection that was not completed will be for one of three reasons. The first reason would be that the project is planned, but not needed until later in the Planning Horizon and thus construction has not started yet. The second reason would be that the project is still under construction. The final reason would be that subsequent TEP analysis determined that the project was no longer needed per the Companies' Planning Guidelines or NERC Standard TPL-001 and thus the project was cancelled.

c. The Companies began utilizing a 90/10 load forecast (extreme weather/high load case) in 2017 to identify new or upgraded facilities or other solutions to resolve constraints. Attached is a table of all TEP projects driven by the 90/10 cases since 2017. It is worth noting that some of these projects may have also been identified in the 50/50 cases but were needed at an earlier date in the 90/10 cases. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

d. See the response and attachment to part (c). Any project identified in the 90/10 cases that was not completed will be for one of three reasons. The first reason would be that the project is planned, but not needed until later in the Planning Horizon. The second reason would be that the project is still under construction. The final reason would be that subsequent TEP analysis determined that the project was no longer needed to comply with the Companies' Planning Guidelines or NERC Standard TPL-001 and thus the project was cancelled.

e. Increased interconnections to neighboring RTOs and/or Balancing Authorities could potentially increase transmission capacity to import or export power, as well as through flows. During Winter Storm Elliott, LG&E/KU experienced some N-1 transmission issues, including several on tie-lines at the southern edge of the Balancing Authority Area ("BA Area") that were primarily caused by through flows. However, at the time of the energy and capacity emergency, LG&E/KU were not experiencing N-1 transmission issues impacting imports into the LG&E/KU BA Area, nor were any tags importing power into the LG&E/KU BA Area curtailed due to

transmission constraints on the LG&E/KU transmission system. As such increased transmission capacity at the tie-lines likely would not have increased the amount of energy that could have been imported into the Companies' system as the limiting factor appears to primarily have been a lack of available firm energy to import. Load shed was the result of a capacity and energy emergency, not an issue with available transmission capacity or an exceedance of transmission system limits. Just prior to shedding load, LG&E/KU was importing power from neighboring entities. These imports were curtailed because neighboring entities were not able to supply the energy, not because LG&E/KU exceeded transmission capacity.

f. It is the Companies' position that new or upgraded transmission infrastructure within the Companies' BA Area would not have increased the amount of energy that could have been imported into the Companies' system during Winter Storm Elliott because energy was not available for import.

During Winter Storm Elliott, the LG&E/KU BA Area did not experience any transmission constraints that impacted or limited the capacity to import power into the BA Area. Therefore, having new or upgraded transmission infrastructure within the LG&E/KU BA Area would not have increased the amount of energy that could have been imported during Winter Storm Elliott.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
Dated March 1, 2024

Question No. 2.6

Responding Witness: David S. Sinclair / Stuart A. Wilson

Q-2.6. Please refer to the Companies' Response to Sierra Club's Request No. 1-38. a.

a. Please identify each of the "inherent risks" with the coal supply chain referenced therein.

b. Please explain how the Companies model these risks when establishing coal inventory target ranges for each coal-fired generating unit.

c. Please identify the extent to which these risks impact the coal inventory levels maintained on the site of each coal plant.

A-2.6.

a. The risks include short-term coal supply shortages, mine outages, barge unloader outages, rail unloader outages, rail line interruptions, and interruptions to barge transportation such as lock failures, flooding, and freezing.

b. The Companies develop probability distributions for the duration of coal delivery interruptions associated with each of these risks. Then, they simulate these risks together to produce 1,000 coal delivery scenarios and evaluate each of these scenarios over a range of coal burn scenarios that reflect the uncertainty due to weather and unit availability.

c. As the likelihood or duration of these risks increase, the inventory target ranges would increase.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Case No. 2023-00422

Question No. 2.7

Responding Witness: Lonnie E. Bellar / David S. Sinclair

Q-2.7. Please refer to the 2023 RTO Membership Analysis provided in Companies' Response to Joint Intervenors' Request No. 1-6.

a. Please explain the basis for Companies' assertion that "exiting an RTO is much more challenging and costlier than entering one" (pp. 1–2).

b. Please provide a copy of the FERC order on rehearing and explain the Companies' current understanding of how the Companies' MMD obligations might be impacted by RTO membership.

c. Please explain the Companies' current understanding of how the Commission's Order in Case No. 2022-00402 may affect Companies' inputs and assumptions in their RTO membership analysis.

A-2.7.

a. This observation is based on the Companies' own experience in exiting MISO. To the best of the Companies' knowledge, the Companies are the only utilities in the country that have exited an RTO and not simultaneously joined another one. Also, to the extent that past RTO studies have shown potential administration and capacity savings from joining an RTO, those savings would have to be reversed upon exit.

b. See rehearing order attached. Due to the status of the ongoing litigation on MMD, it is not possible to identify how the Companies' MMD obligation might be impacted by RTO membership.

c. The Commission's final Order in Case No. 2022-00402 stated at page 177, "This Commission has no interest in allowing our regulated, vertically-integrated utilities to effectively depend on the market for generation or capacity for any sustained period of time." Future RTO studies will have to

evaluate how such a requirement would be met in the context of the market rules and tariffs of an RTO and could reduce the potential capacity savings discussed in response to part (a) or the types of capacity that would be required.

LOUISVILLE GAS AND ELECTRIC COMPANY
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KENTUCKY UTILITIES COMPANY

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Dated March 1, 2024

Case No. 2023-00422

Question No. 2.8

Responding Witness: Lonnie E. Bellar

Q-2.8. Please refer to the Companies' Response to the Attorney General's Request No. 1-5. Please identify by page number and/or subsection the specific portions of the "Analysis and Findings" section of the FERC/NERC Report that you believe "do not reflect the specific issues that impacted the Companies or their preparations for such events."

A-2.8. The LG&E/KU load shed event during Winter Storm Elliott was caused by a drop in gas delivery pressure below contracted limits at the Cane Run and Trimble County gas-fired units. The freezing and mechanical issues experienced by LG&E/KU during Winter Storm Elliott resulted in impacts to generating units that roughly align with the types of events LG&E/KU plan for going into extreme weather conditions – which is why LG&E/KU had significant reserves available. The gas delivery pressure issue that resulted in the capacity and energy emergency that required load shed was unprecedented and caused derates and outages at multiple plants, peaking at 846 MW. The FERC/NERC Report characterizes the gas delivery pressure issues experienced by LG&E/KU as a fuel issue under Section 6. However, the gas delivery pressure issue experienced by LG&E/KU was not caused by production losses or transportation constraints but rather by an equipment/freezing issue at a station on the pipeline that impacted gas pressure, not transportation capacity. Furthermore, LG&E/KU generation has firm supply contracts and firm transportation. For more information, the revised report filed under AG 1-2 details the events of Winter Storm Elliott as they affected the Companies.

Any other analysis and findings as reflected in the FERC/NERC Report did not play a significant role. For example, Section 5 of the Analysis and Findings is not applicable to LG&E/KU because LG&E/KU did not experience issues associated with high wind shutoffs.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Requests
Dated March 1, 2024

Case No. 2023-00422

Question No. 2.9

Responding Witness: Lonnie E. Bellar

Q-2.9. Please refer to the Companies' Response to the Attorney General's Request No. 1-6. With regards to your statement that "[t]he Companies' major issue during Winter Storm Elliott was low gas delivery pressure":

a. Please state whether the Companies consider the outages and derates being experienced at certain Trimble County and Mill Creek coal-fired generating units during Winter Storm Elliott to be "major issues." If not, please explain why not.

b. Please state whether the load shedding and/or rolling blackouts experienced in the Companies' service territory during Winter Storm Elliott would have been lessened if the Companies had not been experiencing outages and derates at certain Trimble County and Mill Creek coal-fired generating units during the storm. If so, please provide any estimate of by how much such load shed and/or rolling blackouts would have been lessened. If not, please explain why not.

A-2.9.

a. The Companies' characterization of the low gas pressure issue as "major" stems primarily from the fact that they had never experienced an issue like this before, and this single issue affected multiple generating units. Regardless, "major" is a subjective term. The Companies carry generation reserves to account for uncertainty in weather and unit availability. The level of unavailable MWs associated with coal unit outages and derates during Winter Storm Elliott is well within the range considered for planning generation and assessing resource adequacy.

b. Any number of hypothetical circumstances could have reduced or increased the level of rotational load shedding that occurred on December 23. That being said, yes, if the Trimble County and Mill Creek coal-fired generating units had been available at full load for the entirety of the event, additional

generating capacity would have been available to mitigate the impact of the Texas Gas related derates.

LOUISVILLE GAS AND ELECTRIC COMPANY
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KENTUCKY UTILITIES COMPANY

Response to Joint Motion of Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society, and Mountain Association's Supplemental Data Requests
Dated March 1, 2024

Case No. 2023-00422

Question No. 2.10

Responding Witness: Lonnie E. Bellar

Q-2.10. Please refer to the Companies' Response to the Attorney General's Request No. 1-8.

a. Please produce any communications with Texas Gas regarding the evaluation of procuring gas storage services and adding dual-fuel capability to existing and planned units referenced therein.

b. Please produce any reports or other documents regarding the results of the evaluation referenced in subpart (a) above.

c. For each of the Companies existing gas-fired generating units, please identify the estimated cost of adding dual-fuel capability and produce any supporting documentation for such estimate.

d. For each of the Companies planned gas-fired generating units, please identify the estimated cost of adding dual-fuel capability and produce any supporting documentation for such estimate.

e. For each of the Companies planned gas-fired generating units, please state whether the estimated cost of adding dual-fuel capability was reflected in the estimated cost for such unit presented to the Commission in the CPCN docket, 2022-00402.

f. Identify any estimated cost for the Companies to procure gas storage services on the Texas Gas system and produce any supporting documentation for such estimate.

A-2.10.

a. See correspondence being provided in separate files.

b. The results of this study are not available. As noted in the response to PSC 1-20, the study is expected to be completed by the middle of 2024.

c. For existing units, the Companies have estimated the cost of adding dual-fuel capability only for the Trimble County CTs. The Companies adjusted the option pricing for Mill Creek 5 to develop these figures for an internal estimate. See the table below.

Incremental Costs of Dual Fuel Capability for Trimble County CTs (per CT)

Cost Item	Cost of 2-Day Supply	Cost of 4-Day Supply	Cost of 10-Day Supply
Capital (Tanks, Infrastructure, Turbine Modifications)	$12.0 M	$22.5 M	$53.5 M
Fuel Oil Inventory (O&M)	$2.2 M	$4.3 M	$10.8 M
Tank/Turbine Maintenance & Inspections	$260,000/Yr	$520,000/Yr	$1.3 M/Yr
Annual Fuel Oil for Testing	$200,000-$250,000/Yr	$200,000-$250,000/Yr	$200,000-$250,000/Yr

d. See the response to PSC 1-20 and the response to the Joint Intervenors Post Hearing Data Response 4.1(a) in Case No. 2022-00402 for fuel oil installation costs.

e. The quoted option cost for fuel oil capability was not included in the estimated cost presented to the Commission in the Case No. 2022-00402.

f. See the response to item (a), attachment 2b.

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Dated March 1, 2024

Case No. 2023-00422

Question No. 2.11

Responding Witness: Stuart A. Wilson

Q-2.11. Please refer to the Companies' Response to the Attorney General's Request No. 1-20. With regards to your reference to Attachment 1 to the Companies' response to Staff's Post-hearing Request No. 20 in Case No. 2022-00402:

a. Please confirm that the referenced document is found at this link - https://psc.ky.gov/pscecf/2022-00402/rick.lovekamp%40lge-ku.com/09152023040050/20-PSC_PH_LGE_KU_Attach_to_Q20_-_Attach_1_LOLE_EUE_PVRR_of_Alternative_Portfolios_-_REDACTED.xlsx If not confirmed, please produce the referenced document.

b. Please explain how the referenced document shows that "winter reliability metrics improve immaterially when solar resources are added to a portfolio."

c. Please state whether the Companies believe that the addition of solar resources to a portfolio improves reliability metrics in other seasons besides the winter. If not, please explain why not and produce any analysis supporting that belief.

A-2.11.

a. Confirmed.

b. The document shows that the portfolios in which solar resources are added (portfolio "e" adds owned solar; portfolio "f" adds solar PPAs) result in significant improvements to LOLE in summer months and only small changes to LOLE in winter months.

c. The Companies' modeling shows that the addition of solar resources improves reliability metrics in summer and does so more significantly than in winter.

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Case No. 2023-00422

Question No. 2.12

Responding Witness: Lonnie E. Bellar / Stuart A. Wilson

Q-2.12. Please refer to the Companies' response to Staff's Request No. 1-20.

a. Please identify the estimated cost of the compression equipment that the Companies currently expect to install on Mill Creek 5 and provide any supporting documentation of such cost estimate.

b. For each of the Companies' other existing or planned gas-fired units, please state whether the Companies expect to install compression equipment.

   i. For each unit for which the Companies expect to install compression equipment, please identify the estimated cost of such equipment.

   ii. For each unit for which the Companies do not expect to install compression equipment, please explain why not.

c. Please confirm that the "broader study" with Texas Gas Transmission referenced therein is the same as the evaluation of procuring gas storage services and adding dual-fuel capability referenced in the Companies' response to the Attorney General's Request No. 1-8. If not confirmed:

   i. Please produce any communications with Texas Gas regarding such "broader study."

   ii. Please produce the "broader study" when it is completed, and any reports or other documents regarding any results or findings of such study to date.

d. Please identify each of the "other options" being evaluated in the "broader study."

e. Please state whether 4-hour battery storage is being evaluated as an option in the "broader study." If not, please explain why not.
f. Please state whether long-duration battery storage is being evaluated as an option in the "broader study." If not, please explain why not.

A-2.12.

a. The executed contract with GE Vernova Operations LLC and The Industrial Company ("TIC") requires installation of a redundant compressor system based on historical gas line pressure to ensure adequate operating pressure at the gas turbine combustion chamber. The noted compression system is base scope within the contract so the specific cost for this component of the project is not known. In addition to the noted redundant compression, the Companies plan to install, outside of the EPC contract, an incremental upstream compressor system capable of boosting pressure beyond the conditions witnessed during Winter Storm Elliott. See the response to PSC 1-26(d) for information and estimated cost associated with this incremental upstream compression.

b. The Companies plan to evaluate added compression for Cane Run 7, the E.W. Brown CTs, Paddy's Run Unit 13, and the Trimble County CTs, but no cost estimates have been developed.

   i. See the response to part (b).

   ii. See the response to part (b).

c. Confirmed.

   i. Not applicable.

   ii. Not applicable.

d. Other options include fuel-oil backup for the Trimble County CTs and added compression for Cane Run 7, the E.W. Brown CTs, Paddy's Run Unit 13, and the Trimble County CTs. In addition, the Companies plan to evaluate the reliability implications of sourcing startup and stabilization fuel for Mill Creek Units 3 and 4 via Texas Gas Transmission instead of from the LG&E LDC.

e-f. Battery storage is not being evaluated. The alternatives being considered are significantly lower cost than battery storage and focused on improving the availability of existing resources.

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Case No. 2023-00422

Question No. 2.13

Responding Witness: Lonnie E. Bellar

Q-2.13. Please refer to the Companies' response to Staff Request Nos. 1-43 and 1-52(a).

a. Please confirm the date on which the data provided was pulled from the Companies' outage management system.

b. Please confirm whether data was pulled from the Companies' outage management system during or immediately after loadshedding during Winter Storm Elliott. If so, please provide such data as a detailed list and corresponding maps of all customers in the LG&E-KU BA who were impacted by loadshedding during Winter Storm Elliott.

c. Please confirm whether Companies have any other data or system in place that may more accurately depict the total customers impacted by Winter Storm Elliott.

A-2.13.

a. The data in response to PSC 1-43 and 1-52(a) was pulled on February 12, 2024.

b. Outage data at the individual customer level was not pulled and stored during or immediately after Winter Storm Elliott. Note that the Companies' outage management system captures the total customers impacted by an outage and reflects affected current customers as of the date the data is pulled. Thus, due to customer turnover since Winter Storm Elliott, the information provided in PSC 1-43 and PSC 1-52(a) is not necessarily an exact depiction of affected customers.

c. The total customers impacted by Winter Storm Elliott is accurate and is maintained in the outage management system. It is only when pulling outage data by individual customer name, address, account, etc. that the system relies on current customer data.

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Case No. 2023-00422

Question No. 2.14

Responding Witness: Lonnie E. Bellar

Q-2.14. Please refer to the Companies' response to Staff Request No. 1-43.

a. Please explain the extent to which the Companies have sought to understand the number of customer households on low-or-fixed-incomes in the LG&E-KU BA who were impacted by loadshedding during Winter Storm Elliott.

b. Please provide the address, county, zip code, and census tract of each customer impacted by loadshedding during Winer Storm Elliott.

c. For each customer and address identified in response to subsection (b) of this request, please provide the time and date for when outages were known or reported, when LG&E-KU resources responded to address known or reported outages, and when service was restored to each customer and address identified.

A-2.14.

a. LG&E and KU did not undertake any such effort.

b. The Company does not maintain census tract data in its records. In lieu of census tract, zip code has been provided in addition to customer data previously provided in PSC 1-43, Attachment 3. See attachment being provided in a separate file. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

c. Load shed outages were initiated and restored by the LG&E/KU TOP/BA. LG&E/KU did not dispatch resources to these customers impacted by load shed events as field intervention was not required to restore power. See attachment being provided in a separate file for load shed start and end times for each customer. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

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Case No. 2023-00422

Question No. 2.15

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-2.15. Please refer to the Companies' response to Staff Request No. 1-54. With regards to the referenced curtailment of non-firm power from PJM:

a. Please identify by day and hour the time at which such curtailment began and ended.

b. Please state whether such curtailment would have prevented the Companies from receiving non-firm energy from other parts of PJM if the Companies were part of PJM. If so, please explain why.

A-2.15.

a. Curtailments of non-firm power from PJM began December 23, 2022 at 16:30 and partially ended at 21:00.

b. The curtailments were a result of PJM curtailing all external exports per their emergency procedures due to generation shortages in PJM. The Companies do not have information regarding the potential to purchase non-firm energy from other parts or counterparties within PJM under those circumstances.

CONFIDENTIAL INFORMATION REDACTED

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Case No. 2023-00422

Question No. 2.16

Responding Witness: Charles R. Schram

Q-2.16. Please refer to the Companies' response to Kentucky Coal Association Request No. 1-16. Please identify in dollars the amount of demand charge credits that Texas Gas Transmission provided to the Companies for December 23 through December 25, 2022.

A-2.16. [redacted] is the demand charge credit for the entire three day period. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

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Case No. 2023-00422

Question No. 2.17

Responding Witness: Lonnie E. Bellar

Q-2.17. Please refer to FERC's February 15, 2024 Order, available at https://www.ferc.gov/media/e-1-rd24-1-000, approving new extreme cold weather reliability standards.

a. Please describe in practical terms what these new extreme cold weather reliability standards will mean for the Companies' operations.

b. Please identify any ways in which the Companies believe their practices already comply with the new standards.

c. Please identify any changes that the Companies believe they will need to make to comply with the new standards.

d. For each change identified in subpart (c), please identify the steps that the Companies intend to take to achieve compliance

A-2.17.

a. As the FERC order approving EOP-011-4 and TOP-002-5 was only recently issued, the Companies are still in the preliminary stages of evaluating what the practical impact will be on the Companies' operations. As indicated in the February 15, 2024 Order, while an October 18, 2025 implementation date was set for TOP-002-5, the Commission deferred ruling on the implementation date for EOP-011-4 (pending requested action on EOP-012-2, which was filed for approval on February 16, 2024). As such, the Companies are still awaiting action from FERC to clarify the implementation date for EOP-011-4.

b. The Companies have yet to complete an evaluation of existing practices as compared with the new standards.

c. As indicated above, the Companies are still in the preliminary stages of evaluating the new standards and have yet to identify any changes.

d. Not applicable, see above (no changes identified as yet).