COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC JOINT APPLICATION OF KENTUCKY UTILITIES COMPANY AND LOUISVILLE GAS AND ELECTRIC COMPANY FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY AND APPROVAL OF A DEMAND SIDE MANAGEMENT PLAN	**)** **)** **)** **)** **)** **)** **)**	**CASE NO. 2022-00402**

RESPONSE OF
KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY
TO
THE METROPOLITAN HOUSING COALITION, KENTUCKIANS FOR THE COMMONWEALTH, KENTUCKY SOLAR ENERGY SOCIETY AND MOUNTAIN ASSOCIATION'S
SUPPLEMENTAL REQUEST FOR INFORMATION
DATED APRIL 14, 2023

FILED: MAY 4, 2023

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Lonnie E. Bellar**, being duly sworn, deposes and says that he is Chief Operating Officer for Louisville Gas and Electric Company and Kentucky Utilities 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.

Lonnie E. Bellar

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

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

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **John Bevington**, being duly sworn, deposes and says that he is Director – Business and Economic Development for 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.

John Bevington

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

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

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy**, being duly sworn, deposes and says that he is Vice President, State Regulation and Rates, 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.

Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

TAMMY J. ELZY
COMM EXPIRES 11/09/2026
NOTARY PUBLIC
ID # KYNP61560
STATE AT LARGE, KENTUCKY

Notary Public

Notary Public ID No. KYNP61560

My Commission Expires:

November 9, 2026

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Christopher M. Garrett**, being duly sworn, deposes and says that he is Vice President, Finance and Accounting, 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.

Christopher M. Garrett

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

TAMMY J. ELZY
NOTARY PUBLIC
ID # KYNP61560
STATE AT LARGE, KENTUCKY
COMM EXPIRES 11/09/2026

Notary Public

Notary Public ID No. KYNP61560

My Commission Expires:

November 9, 2026

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Philip A. Imber**, being duly sworn, deposes and says that he is Director – Environmental and Federal Regulatory Compliance for 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.

Philip A. Imber

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 2nd day of May 2023.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

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

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Lana Isaacson**, being duly sworn, deposes and says that she is Manager – Emerging Business Planning and Development for Louisville Gas and Electric Company and Kentucky Utilities Company, 220 West Main Street, Louisville, KY 40202, and that she has personal knowledge of the matters set forth in the responses for which she is identified as the witness, and the answers contained therein are true and correct to the best of her information, knowledge, and belief.

Lana Isaacson

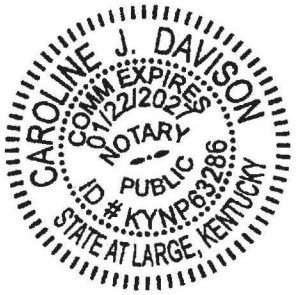
Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027



VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Tim A. Jones**, being duly sworn, deposes and says that he is Manager – Sales Analysis and Forecast for 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.

Tim A. Jones

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 1st day of May 2023.

Notary Public

Notary Public ID No. KYNP 63286

My Commission Expires:

January 22, 2027

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

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 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.

Charles R. Schram

Subscribed and sworn to before me, a Notary Public in and before said County and State this 1st day of May 2023.

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

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 1st day of May 2023.

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 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 1st day of May 2023.

Notary Public

Notary Public ID No. KYNP 63286

My Commission Expires:

January 22, 2027

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

KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY

Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information Dated April 14, 2023

Case No. 2022-00402

Question No. 1

Responding Witness: John Bevington / Tim A. Jones

Q-1. Refer to the Companies' response to Joint Intervenors Q.1.123.c.i regarding fuel switching from electric to gas.

a. Have the Companies proposed any fuel switching from electric to gas measures in their EE/DSM Plan? For any answer other than "no" please provide a detailed description of the measure(s), the program in which the measure(s) will be offered, and the expected program expenditure for the measure(s) by year.

b. Please confirm that the Companies have included fuel switching from fossil fuel end uses to electricity in their projection of the impacts on the load forecast of IRA investments.

A-1.

a. No.

b. Confirmed.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Question No. 2

Responding Witness: Lana Isaacson

Q-2. Refer to the Companies' response to Joint Intervenors Q-1.125.b. The Companies state that "there are alternate, lower cost options available now that were not available at the time of the initial direct load control deployment which may be installed at a customer's request if a switch fails."

a. This statement implies that the Companies only address switch failures at the request of customers. Is this accurate?

b. Please describe any proactive efforts the Companies take to enroll current Connected Solutions customers in load control programs that rely on "alternate, lower cost options."

i. Do the Companies engage with Connected Solutions customers regarding alternate, lower cost options only after a switch fails, or do the Companies proactively work to sustain the participation of Connected Solutions customers in DLC initiatives by encouraging them to obtain alternate participation options? Please explain.

A-2.

a. Yes. Most switches are capable of only one-way communication. Without the request of a customer, the Companies do not know if a switch has failed or been disconnected.

b. The Connected Solutions offering is a newly proposed program. There are no current customers.

i. See the response to part (b).

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Question No. 3

Responding Witness: Lana Isaacson

Q-3. Refer to the Companies' response to Joint Intervenors Q-1-126.b. Please provide a list of each measure or measure category for which multi-family property owners were offered a 50% incremental cost incentive in 2021 and 2022, including the number of times an incentive was offered for each measure or measure category and the number of times for each measure or measure category the property owner accepted the incentive and installed the measures. In other words, please provide the acceptance rate and number of installations for each measure or measure category offered to multi-family property owners for 2021 and 2022.

A-3. The Income-Qualified Solution for multi-family units is a newly proposed offering. Therefore, there is no historical data to provide.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Question No. 4

Responding Witness: Lana Isaacson

Q-4. Please refer to the Companies' response to Joint Intervenors Q-1.129.a.

a. In each scenario the attachment provided assumes a 40% down payment on the Total project cost to reduce the PAYS project cost from $7,592 to $4,555.

i. Have the Companies made any assumptions regarding how the down payment would be paid? For instance, do the Companies assume that participants will pay the 40% down payment from their own funds, or do the Companies assume that the 40% down payment will be paid through a program incentive? Please explain.

b. The Companies appear to assume that certain categories of costs, including Program Set Up Cost, Direct Program Labor, Office Supplies and Expenses, Training, Advertising, and Evaluation are the same regardless of the number of participants.

i. Please confirm that the Companies position is that these costs would not vary with participation.

ii. If subpart b.ii. is confirmed, please explain why this would be the case. For example, why would 100 participants require the same level of Direct Program Labor as 1000 participants? Why would 100 participants require the same level of Advertising as 1000 participants?

c. The notes for the budget category "Outside Services" and the budget category "Rebates" both indicate that the costs are attributable to interest buydowns.

i. Please explain, in detail what is included in the budget category "Outside Services" and the budget category "Rebates" and confirm that there is no

duplication of costs.

d. Does the analysis in the attachment assume that the only rebates or incentive provided by the Companies are to buy down interest rates, or does the analysis assume there would also be direct rebates or incentives? Please explain.

A-4.

a.

i. The only assumption was a 40% down payment, not specifying the source of said payment. Although the customer is responsible for the down payment, it does not have to originate from the customer's own funds. Thus, the down payment could be provided by the customer or a third party, including a nonprofit.

b.

i. Confirmed.

ii. There is not a direct correlation between Direct Program Labor and the number of participants. Therefore, the Companies would adjust the team resources to ensure high customer satisfaction should that be necessary with 100 participants or 1,000 participants. With respect to Advertising, an effective campaign can drive higher participation. The participation levels are not influenced only by the budget for this specific activity.

c.

i. The Outside Services budget category includes a per project audit fee of $575 and $11 per project for annual implementation costs. The annual implementation cost includes $7 for transfer costs based on an average household move request of every 7 years and $4 assuming 0.05% uncollectible rate against a $7,592 project cost. The Rebates budget category represents the discounted value of the interest buydown over a 12-year loan term times the number of participants. There is no duplication of costs between these two budget categories.

d. The incentives in this analysis are based on buying down the interest rate and do not include direct rebates.

KENTUCKY UTILITIES COMPANY
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Question No. 5

Responding Witness: Lana Isaacson

Q-5. Please refer to the Companies' response to Joint Intervenors Q-1.129.h, which explains that Ex. JB-3 "does not make any assumptions related to federal incentives" for energy efficiency upgrades, and states that "At the time the analysis was finalized, the Companies did not know the incentives that will be available through the Inflation Reduction Act, eligibility specifics, and application processes."

a. Please confirm that Ex. JB-3 does not include any assumptions related to federal incentives, including federal incentive programs that pre-date the Inflation Reduction Act. If not confirmed, please explain.

b. In the Companies' view, could incentives for energy efficiency provided under the Inflation Reduction Act impact the cost-effectiveness results provided in Ex. JB-3? Please explain.

c. In the Companies' view, could incentives for energy efficiency provided under the 2021 Infrastructure Investment and Jobs Act (IIJA) impact the cost-effectiveness results provided in Ex. JB-3? Please explain.

A-5.

a. Confirmed.

b. Yes, incentives could increase or decrease cost-effectiveness. While the Companies are not aware of IRA specific guidance being released yet on its energy efficiency initiatives, the IRA does offer incentives that are similar to those outlined in the Companies' proposed DSM Plan. For example, the Residential Online Audit with prescriptive residential rebates includes heat pump water heaters and heat pumps. The IRA offers incentives for these same measures. If the IRA guidance allows a qualifying homeowner to participate in both IRA and utility incentives, that would likely elevate the participation

level above forecasted levels. Conversely, if a homeowner may only choose from one of the eligible options, that could lower the participation levels. The participation levels are an input to the overall avoided energy and avoided capacity benefits used in the TRC, PAC, and RIM cost-effectiveness tests. Another example of this relates to customer incentives from the IRA that could reduce the incremental customer costs, thus increasing the TRC and PCT scores.

c. Yes, see the response to part (b). Incentives for energy efficiency provided under the 2021 IIJA could similarly increase or decrease cost-effectiveness.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Question No. 6

Responding Witness: Lana Isaacson

Q-6. Please refer to the Companies response to Joint Intervenors Q-1.130.

a. What is the basis of the Companies' 15 year measure life assumption?

b. Please confirm that the file "DSM Savings Summary_Cadmus_Final_D02" included in Exhibit TAJ-3 PUBLIC indicates on the tab "Combine InputMeasure" in cell W5 that the EUL for "KU-WeCare Weatherization Project – Single Family – Complete Package" is 20 years. For any answer other than "confirm" please explain the response in detail.

c. Why would it be reasonable for the Companies to assume different measure lives for a single family weatherization project and a PAYS project? Please provide any justification the Companies believe support its decision to model PAYS with a 15 year life.

A-6.

a. The Companies used assumptions provided by the Mountain Association during the DSM Advisory Group process. This included the 15-year measure life and other inputs and assumptions.

b. Confirmed.

c. See the response to part (a).

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information Dated April 14, 2023

Case No. 2022-00402

Question No. 7

Responding Witness: Lana Isaacson

Q-7. Please refer to the Companies' response to Joint Intervenors Q-1.131.c.i: "Cadmus selected the scenario population assumptions using realistic expectations for the number of potential participants from historic performance for similar programs in Kentucky."

a. Please confirm that the basis Cadmus used for determining "realistic expectations for the number of potential participants" is the "historic performance for similar programs in Kentucky." For any answer other than "confirm" please provide all data sources used to determine "realistic expectations."

b. Please confirm that the "historic performance for similar programs in Kentucky" would not account for incentives created, increased, or expanded by the Inflation Reduction Act. If anything but confirmed, please explain.

A-7.

a. Confirmed.

b. Confirmed.

KENTUCKY UTILITIES COMPANY
AND
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
Dated April 14, 2023

Case No. 2022-00402

Question No. 8

Responding Witness: Lana Isaacson

Q-8. Please refer to the Companies' response to Joint Intervenors Q-1.131.c.ii, referring to "economies of scale."

a. Confirm that the Companies did not reflect any economies of scale in their PAYS analysis other than in the Outside Services and Rebates budget categories.

A-8.

a. Confirmed.

KENTUCKY UTILITIES COMPANY
AND
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information Dated April 14, 2023

Case No. 2022-00402

Question No. 9

Responding Witness: Lana Isaacson

Q-9. Please refer to the Companies' response to Joint Intervenors Q-1.134.b. Please provide a list of all criteria, including the weighting of each, used in the potential study to "calculate the achievable potential."

a. Did the potential studies consider the effect that enhanced program design, outreach/marketing, technical support, and/or incentives could have in increasing the "achievable potential?" Please explain.

A-9. See the "Research Approach" section of Exhibit LI-1 for the methodology utilized to determine EE potentials.

a. Yes. For examples, see Exhibit LI-2 at pages 11-12, which discusses incentive adjustments and their impacts on potentials. Also, see Attachment 1 to JI 1-141(a), which discusses various incentive levels and the corresponding impact of potentials (see Figures 23 and 24 and Tables 44 and 45).

KENTUCKY UTILITIES COMPANY
AND
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Case No. 2022-00402

Question No. 10

Responding Witness: John Bevington

Q-10. Please refer to the Companies' responses to JI 1.109 and JI 1.103, and answer the following requests.

a. If the Companies do not track income data on customers, on what basis did the Companies determine an appropriate number of customers to reach through income-qualified programs? Please explain.

b. If the Companies do not have any data quantifying the customers that may be eligible for income-qualified programs, on what basis did the Companies determine to expand the eligibility threshold from 200% FPL to 300% FPL? Please explain.

A-10.

a. The current 2019-2025 DSM Plan allows for 4,000 WeCare participants each year, and the Companies have been able to service the forecasted number of customers in the current plan. These facts provided the basis for the further evaluation of the expanded program. The proposed 2024-2030 DSM Plan increases this participation level to 4,590 each year. In addition, the proposed Plan provides for 800 multi-family participants each year.

b. Expanding the eligibility threshold from 200% FPL to 300% FPL would allow a broader group of customers to meet the eligibility requirements if they desired to participate in the WeCare program.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Case No. 2022-00402

Question No. 11

Responding Witness: Lana Isaacson

Q-11. Please refer to Ms. Isaacson's Direct Testimony, page 6, lines 14–18, which states that "the Companies propose to expand the successful WeCare program in a number of meaningful ways to reach more customers, including expanding the eligibility to serve customers who are at or below 300% of the federal poverty level" as well as to the Companies response to Joint Intervenors Q-1.135.

a. How many households with incomes at or below 300% of the federal poverty level are served by the Companies and thus would be eligible to participate in the WeCare program with the proposed income qualification?

b. How many households with incomes at or below 200% of the federal poverty level are served by the Companies and thus are currently eligible to participate in the WeCare program?

c. Regarding the Companies' response to Joint Intervenors Q-1.135(b), please explain in full why the Companies will not use any of the following data categories to target eligible customers: (i) energy use; (ii) bill payment history; (iii) arrearage history; and (iv) receipt of fuel assistance.

A-11.

a. The Companies do not track income data for customers. For this reason, the requested information cannot be provided.

b. See the response to part (a).

c. The Companies do not currently intend to utilize this type of information to target potentially eligible customers. The WeCare program has met or exceeded its participant target of 4,000 annual participants during each year of the current Plan period. The Companies partner with community agencies that serve the needs of vulnerable customers and assist in locating, and

outreach to, potentially qualifying customers for the WeCare program. Given the success of the Companies' outreach efforts, the Companies have not needed to use additional outreach efforts to target potential customers.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information Dated April 14, 2023

Case No. 2022-00402

Question No. 12

Responding Witness: Lana Isaacson

Q-12. Please refer to the Companies' response to Joint Intervenors Q-1.135.b. The original question is reproduced here for convenience: "Will the Companies also use non-public data, such as energy use, bill payment and arrearage histories, and/or receipt of fuel assistance to target eligible customers? If yes, please explain how they will use these data. ***If no, please explain why not***." (emphasis added).

a. Please answer the question asked by explaining why the Company will not use the listed data that are available to them to target eligible customers to participate in the WeCare program.

A-12.

a. See the response to Question No. 11(c).

KENTUCKY UTILITIES COMPANY
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Case No. 2022-00402

Question No. 13

Responding Witness: Lana Isaacson

Q-13. Please refer to the Companies' response to Joint Intervenors Q-1.136.a.

a. Do the Companies believe that the proposed 10% estimated cost increase from the 2019-2025 Plan for WeCare measures is sufficient?

b. If costs are in fact, higher on average than the 10% estimate what would be the effect on the We Care program? Would fewer measures be installed per household, or would fewer households be served? Or, would the Companies request additional budget approvals to ensure that the impact of the program would not be diminished?

A-13.

a. Yes.

b. The budget is managed as an average amount per home. For those homes where fewer measures are necessary, the excess funds are used at a home where more measures are necessary. If costs increase, the Companies will still attempt to serve the 4,590 homes described in the DSM/EE Program Plan and prioritize the weatherization efforts for each home that are most effective.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Case No. 2022-00402

Question No. 14

Responding Witness: Lana Isaacson

Q-14. Please refer to the Companies' response to Joint Intervenors Q-1.136.b.

a. Confirm that the Companies do not maintain any records of appropriate energy efficiency upgrades that are not installed in participating customers' homes, and thus have no basis for determining whether the average allowable measure cost is appropriate for addressing the opportunities available to save energy for participating customers. For any answer other than "confirm" please explain.

b. Given the Companies do not track opportunities that are foregone in participating customers' homes, how is calibrating potential in the potential studies to historic performance a reliable indicator of potential?

A-14.

a. Confirmed. See response to Question No. 13(b). The average allowable measure cost is based on industry practices identified in the potential study.

b. It is unclear to which potential studies the request refers or precisely what "calibrating potential in the potential studies to historic performance" means. Nonetheless, tracking measures previously *not* installed in homes should not have a material, if any, effect on DSM-EE potential projections. For example, in the 2022 Cross-Sector DSM Potential Study Projection (Exhibit LI-1), technical potential was reduced by program *accomplishments*, not measures forgone, which in turn necessarily reduced resulting economic and achievable potential. That is methodologically sound: a vital part of developing technical potential is projecting a measure's existing saturation, including *known* deployments like those resulting from the Companies' DSM-EE programs, to understand how much deployment potential remains. Historical, known *non*-deployments would have no role in calculating technical potential, and they had no role in calculating either economic or achievable potential.

KENTUCKY UTILITIES COMPANY
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Case No. 2022-00402

Question No. 15

Responding Witness: Lana Isaacson

Q-15. Please refer to the Companies' response to Joint Intervenors Q-1.137.b, stating "The goal is to maximize funding options available to participating income qualified customers using both the available IRA funds and DSM/EE funds."

a. Have the Companies estimated the amount of funding that may be available to its customers through the IRA? If yes, please provide the Companies' estimates and assumptions related to IRA funding for its customers, including the amount it believes may be available through each of the programs it has identified as likely funding sources.

A-15.

a. To date, no specific IRA Home Energy Rebate Program guidance is available from the U.S. Department of Energy or the Kentucky Energy and Environment Cabinet to the Companies' knowledge, and therefore no amount of funding has been estimated.

KENTUCKY UTILITIES COMPANY
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Question No. 16

Responding Witness: Tim A. Jones

Q-16. Please see Exhibit TAJ-1, p. 22: "the energy efficiency reflected in the figure above results in summer peak demand reductions in 2035 through 2038 ranging from 341 MW to 367 MW and winter peak demand reductions ranging from 256 MW to 279 MW. In 2043, the resulting summer peak demand reduction is 406 MW, and the winter peak demand reduction is 313 MW."

a. Do the figures in the cited statement include demand response MW reductions, or only demand reductions associated with energy efficiency?

b. Please provide a breakdown of the different sources of demand reductions, by year through 2043, to make clear how much comes from the Companies' EE and DR programs and how much comes from customer-initiated projects.

c. Please provide a specific reference in the TAJ-3 workpapers showing the calculations that support the statement.

A-16.

a. As described on page 17 of the Jones Testimony, the Companies modeled the effects of both non-dispatchable DSM programs and customer-initiated energy efficiency (which includes impacts of the IRA) together.

With that understanding, the figures referenced above include only reductions related to energy efficiency. Demand response was modeled as a supply-side resource.

b. The table below allocates total demand impact based on the proportion of non-dispatchable DSM and customer-initiated energy efficiency in Figure 21 of Exhibit TAJ-1. Note that Figure 21 holds 2030 impact of 2024-2030 DSM programs constant as a simplifying assumption. This does not suggest that *all* incremental energy efficiency improvements after 2030 are customer-

initiated; some could certainly be related to future DSM programs. However, because those programs do not exist today, the Companies have labeled the incremental growth as customer-initiated.

Year	DSM-EE Winter Reduction (MW)	Customer-Initiated Winter Reduction (MW)	DSM-EE Summer Reduction (MW)	Customer-Initiated Summer Reduction (MW)
2024	-13.2	-35.6	-20.0	-53.8
2025	-28.5	-41.9	-42.2	-62.1
2026	-48.7	-45.7	-70.2	-65.9
2027	-72.1	-43.9	-102.5	-62.4
2028	-96.0	-40.8	-135.0	-57.4
2029	-117.0	-38.7	-163.6	-54.1
2030	-135.4	-43.2	-187.3	-59.8
2031	-135.8	-63.1	-186.6	-86.7
2032	-136.4	-81.8	-185.5	-111.2
2033	-137.3	-98.1	-185.3	-132.5
2034	-137.3	-108.4	-184.6	-145.7
2035	-137.8	-118.2	-183.6	-157.5
2036	-137.3	-126.8	-182.4	-168.5
2037	-138.0	-134.4	-182.2	-177.5
2038	-137.9	-141.4	-181.5	-186.0
2039	-138.1	-148.0	-180.8	-193.8
2040	-137.6	-155.3	-180.2	-203.4
2041	-138.0	-161.8	-180.3	-211.5
2042	-137.7	-167.8	-180.1	-219.4
2043	-138.3	-174.3	-179.8	-226.6

c. See Exhibit TAJ-3 (confidential workpapers) at Hourly_Forecast_Updates\Testimony_Support\tbl10_OvernightCharging_Final_D03_Reductions_Values.xlsx

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Question No. 17

Responding Witness: Lana Isaacson / Tim A. Jones

Q-17. Please see Exhibit TAJ-1, p. 22: "the Companies have not explicitly forecasted energy requirements reductions resulting from energy efficiency for industrial customers, and the DSM-EE programs were assumed to reduce only residential and commercial loads."

a. Do the Companies have any information based on major accounts management or otherwise on whether their opted-out industrial customers are installing energy efficiency measures of their own volition?

b. Did the Companies include projections of customer-initiated energy efficiency by industrial customers in its load forecasts? If yes, please explain the Companies' assumptions and estimates, and provide their basis. If no, Please explain why they did not.

c. Please describe any requirements for industrial customers to choose to opt-out.

d. Please explain any reporting requirements for the Companies' industrial customers who elect not to participate in the Companies energy efficiency programs.

A-17.

a. Yes, but only to the extent that customers communicate it to the Companies or it is apparent in the historical data. As part of the major account process described in TAJ-2, customers could make the Companies aware of special projects that have been or will be done to reduce energy or demand. These projects are then incorporated into the forecast. Even in cases in which customers do not provide this information, any apparent level shifts or trends in a customer's data are considered in the forecast.

b. The major accounts represent a large percentage of total industrial load. Outside of the major account process discussed in the response to part (a), there are no explicit adjustments made to econometric models to reflect additional customer-initiated energy efficiencies. Any efficiency gains that have occurred in the history are considered implicitly in the models.

c. Industrial or energy-intensive customers who are eligible to opt-out must complete the opt-out form and submit it to the Companies. An industrial or energy-intensive customer may opt-out of the DSM mechanism for those-electric services under the RTS, FLS, or TODP rate groups or natural gas services under the IGS, AAGS, SGSS, or FT rate groups. The opt-out form also lists the requirements needed to opt-out, which includes attesting that the customer has been or is investing in customer initiated energy efficiency investments.

d. There are no additional reporting requirements after the completed opt-out form has been submitted.

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Question No. 18

Responding Witness: John Bevington

Q-18. Please refer to the Companies response to Attorney General's Q-67.a.

a. Please provide the annual budgets for each year in the columns headed with "Current Budget for 2024 & 2025" and "New Budget for 2024-2030."

A-18.

a. See below. There may be slight differences in some totals due to rounding.

Existing Program	Current Budget for 2024	Current Budget for 2025	Current Budget for 2024 & 2025
Program Dev & Admin	$0.7	$0.8	$1.5
Income-Qualified Solutions	$6.3	$6.4	$12.7
Business Solutions	$4.1	$3.9	$8.0
Connected Solutions	$2.4	$2.3	$4.7
Nonresidential DR	$0.8	$0.9	$1.7

Existing Program	New Budget for 2024	New Budget for 2025	New Budget for 2026
Program Dev & Admin	$3.6	$3.6	$2.7
Income-Qualified Solutions	$10.1	$10.1	$10.1
Business Solutions	$5.3	$5.8	$7.8
Connected Solutions	$5.8	$5.9	$7.2
Nonresidential DR	$3.5	$4.1	$4.7

Existing Program	New Budget for 2027	New Budget for 2028	New Budget for 2029
Program Dev & Admin	$2.9	$2.8	$2.8
Income-Qualified Solutions	$10.2	$10.1	$10.1
Business Solutions	$8.1	$8.4	$7.5
Connected Solutions	$11.2	$22.0	$23.4
Nonresidential DR	$5.6	$6.5	$7.3

Existing Program	New Budget for 2030	New Budget for 2024-2030
Program Dev & Admin	$3.0	$21.3
Income-Qualified Solutions	$10.2	$70.9
Business Solutions	$7.0	$49.9
Connected Solutions	$25.2	$100.7
Nonresidential DR	$6.9	$38.5

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Question No. 19

Responding Witness: Lana Isaacson

Q-19. Please refer to the Companies' response to Commission Staff Q-20.e, which states "the Commission approved the Companies' request to cease the [New Home Construction Rebates] program in Case No. 2014-00003, at which time the Companies had achieved maximum results."

a. Please explain what the Companies mean in stating the program "had achieved maximum results."

b. What criteria determined that the Companies "had achieved maximum results"?

A-19.

a. The New Home Construction Program focused on two specific areas: providing training to the regional builders on the requirements of the national ENERGY STAR model and builders obtaining a Home Energy Rating System ("HERS") score that exceeded code on newly constructed homes. As a result of the program, the Companies successfully trained more than 300 builders with nearly 30 HERS Raters. In addition to successfully achieving the outreach and education targets, the Companies exceeded the energy and demand targets at an overall lower cost than forecasted.[1]

b. See the response to part (a).

[1] *See Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New, Demand-Side Management and Energy Efficiency Programs*, Case No. 2014-00003, Direct Testimony of Michael E. Hornung, Exhibit MEH-1 at 54-55 (Ky. PSC filed Jan. 17, 2014).

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Question No. 20

Responding Witness: Lana Isaacson / Tim A. Jones / Stuart A. Wilson

Q-20. Please refer to the Companies' response to Commission Staff Q-33.a: "The Companies' assumed energy-efficiency savings are already near or at the upper bounds of reasonableness given existing technology and economics."

a. Please explain, in detail, how the Companies define the terms "upper bounds," "reasonableness," "existing technology," and "economics."

b. Is the Companies' determination that higher levels of energy-efficiency savings would not be reasonably achievable based on the potential studies?

c. Are the Companies aware of other jurisdictions in which higher levels of energy efficiency savings are being obtained?

d. Please provide any empirical data used by the Companies to determine that higher levels of energy-efficiency savings would not be reasonably achievable.

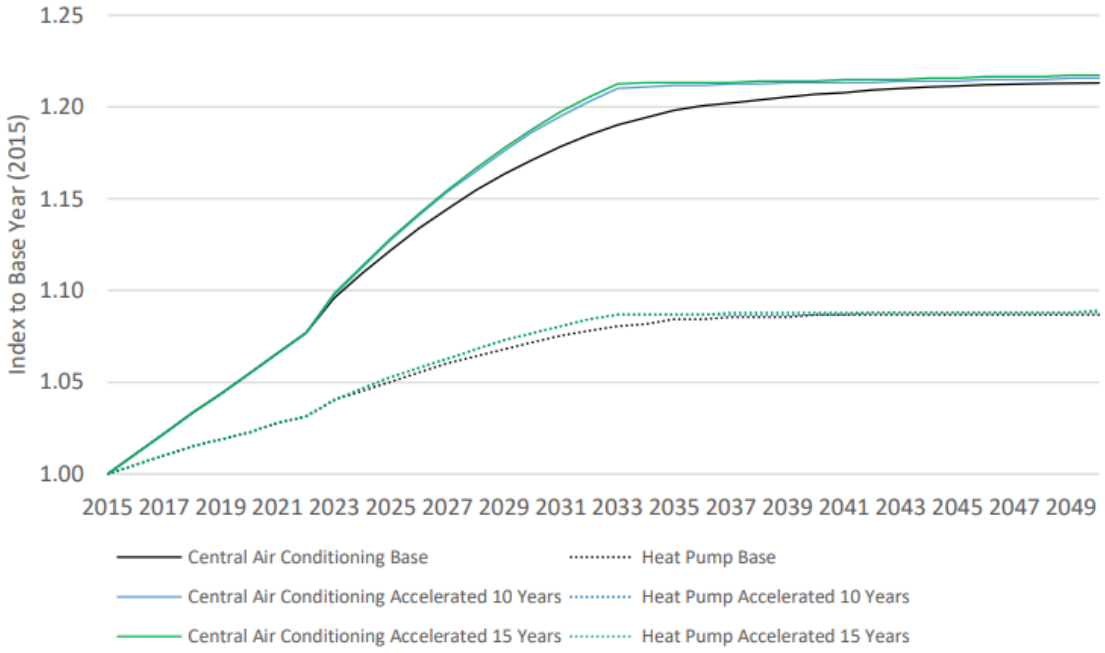
A-20.

a. See Exhibit TAJ-1 Section 3.5 for a detailed discussion of how the Companies accounted for energy efficiency in their load forecast, which is the basis for the quote at issue in this request. See also Exhibit TAJ-2 Sections 4.1 and 4.1, as well as Appendices A and B.

The Companies included energy efficiency in their load forecast using U.S. Energy Information Administration ("EIA") end-use efficiency data for various types of residential and commercial end uses. To model the effects of the Inflation Reduction Act ("IRA") and the Companies' own expanded demand-side management and energy efficiency ("DSM-EE") portfolio, the Companies accelerated EIA-projected end-use efficiencies by ten years, i.e., the Companies assumed 2043 levels of efficiency would apply in 2033 and

compressed the efficiency increases in the intervening years to achieve that result. Choosing 2043 as the year for accelerating efficiency increases was not arbitrary; rather, as illustrated in Figure 19 of TAJ-1 regarding heat pump and central air conditioning, EIA's projected end-use efficiencies effectively plateau by 2043:

Figure 19: Residential Central Air Conditioning and Heat Pump Efficiency Index



The plateauing of EIA's end-use efficiency projections illustrates that at any given time there are (1) technological limitations to how efficient an end use can be, i.e., any further efficiencies for that end use will require technological innovations beyond the current state of the art and (2) economic limitations on which technologies customers can cost-effectively adopt. Therefore, the Companies' statement, "The Companies' assumed energy-efficiency savings are already near or at the upper bounds of reasonableness given existing technology and economics," means simply this: Objective, independent EIA data concerning future end-use efficiencies indicates that those efficiencies will be near or at their currently projected technological and economic limitations by or about 2043. That is what the Companies mean by saying that they believe their energy efficiency savings are near or at the upper bounds of reasonableness under current conditions vis-à-vis technological and economic constraints.

Also, by assuming their customers will achieve 2043 levels of end-use efficiencies by 2033, the Companies are effectively assuming that the economic incentives provided by the IRA and the Companies' DSM-EE programs will achieve those accelerated levels of efficiency adoption.

Therefore, barring a significant change in the economics of deploying more efficient end uses—such as large price decreases or even greater incentives or subsidies, which would likely need to be exogenous to the Companies to be cost-effective—the Companies believe their efficiency *adoption* assumptions are near or at the upper bounds of what the economics of the IRA and *cost-effective* DSM-EE programs in the Companies' Kentucky service territories could justify.

To be clear, the Companies are not saying that achieving even more rapid deployment of end-use efficiencies could not be achieved if economics were irrelevant. For example, if a federal program offered free state-of-the-art heat pumps to all who wanted them, it could accelerate the increase in efficiency-related savings (though any number of practical constraints might limit the rate of deployment). But again, the Companies' statement assumes both technological and economic constraints as they can be reasonably projected today. The relevant economic constraints are highly dependent on the Companies' own avoided capacity and energy costs, which can and do differ from those of other utilities and jurisdictions, as discussed in part (c).

b. See the response to part (a) concerning the basis of the Companies' determination. Note that the Companies' determination is consistent with the Cadmus 2022 Cross-Sector DSM Potential Study Projection, as noted in the Direct Testimony of Tim A. Jones at page 20, "Notably, the Companies' forecasted energy savings resulting from energy efficiency compare favorably to the energy savings projected for achievable cumulative energy efficiency potential shown in Table 1 of the Cadmus 2022 Cross-Sector DSM Potential Study Projection (Exhibit LI-1 to the testimony of Lana Isaacson)."

c. The Companies assume this request is asking whether other utilities' energy efficiency programs have created higher levels of energy efficiency savings than the Companies' proposed DSM-EE program portfolio. To the best of the Companies' knowledge, there are utilities in other jurisdictions whose energy efficiency programs have created higher levels of energy efficiency savings than those the Companies have proposed here. But any such comparison must account for a number of factors, including, but not limited to, the energy consumption and efficiency levels that serve as the baseline for comparison, other utilities' avoided energy and capacity costs, other utilities' rates, and state-level energy efficiency mandates and incentives.

d. See the responses to parts (a) and (b).

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Question No. 21

Responding Witness: Tim A. Jones

Q-21. Please refer to the Companies response to Commission Staff Q-73.b. Given "the Companies did not calculate the lifetime savings values" please explain how they accounted for savings persistence in its load forecasts.

A-21. See the response to Question No. 16.

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Question No. 22

Responding Witness: Tim A. Jones

Q-22. Please refer to the Companies' response to Commission Staff Q-82.b, Item #3 which states that Res TOU "is a base rate design offering and was not considered in the current DSM/EE Plan."

a. Please explain how demand savings associated with Res TOU were reflected in the load forecast. If they were not reflected in the load forecast please explain why not.

A-22.

a. Demand savings associated with residential time-of-use ("RTOD") rates are implicitly assumed in the load forecast as recent years' load shapes include impacts from any behavioral changes customers may have adopted when changing to RTOD rates. Such demand savings, if any, would necessarily be quite small; as noted in the Companies' response to PSC 2-4, there are only about 220 RTOD-Energy customers and eight RTOD-Demand customers across both Companies.

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Question No. 23

Responding Witness: Tim A. Jones

Q-23. Please refer to Exhibit TAJ-1, p. 3: "BlueOval SK Battery Park is the major driver of change from the 2021 IRP load forecast, with almost 260 MW summer peak load, about 225 MW winter peak load, and a load factor of almost 90%."

a. Please describe the Companies assumptions for BlueOval regarding the applicability of demand response programs and/or interruptible tariffs to mitigate the expected summer and winter peak loads.

b. Do the peak load assumptions in the statement cited above reflect participation in any demand response programs or interruptible tariffs? If yes, please indicate what the peak loads would be absent such participation. If no, please explain why not.

A-23.

a. Blue Oval is assumed not to participate in the Companies' demand response programs or interruptible tariffs. See the responses to Question No. 50, PSC 1-38, and Joint Intervenors 1-89.

b. See the response to part (a). In addition, because the Companies model demand response and interruptible tariff rates or riders as supply side resources, they do not include them in the load forecast. If they also reduced peak demands, they would be double counted.

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Question No. 24

Responding Witness: Tim A. Jones

Q-24. Please refer to Exhibit TAJ-1, p. 18: "Because heat pumps have the highest rebate of any appliance discussed in the IRA, space heating electrification is anticipated to increase as a result. This will especially increase morning, evening, and overnight load during the winter months."

a. Please describe all assumptions used by the Companies in projecting peak demand effects resulting from increased space heating electrification, including the following:

i. Prevalence of "standard" vs. cold-climate heat pumps;

ii. Heat pump performance at design temperatures and requirements for back-up resistance heating;

iii. Applicability of and participation in heating demand response programs.

A-24.

a. Regarding the projected saturation of heating electrification, see Exhibit TAJ-1 at 37-38, particularly the last paragraph on page 37.

Regarding hourly electric heating load shapes, see Exhibit TAJ-3 at Hourly_Forecast_Updates\End_Use_Analysis and Hourly_Forecast_Updates\Space_Heating_Electrification. As described in Exhibit TAJ-2 at 19, the load shape to account for accelerated electric heating was layered on using electric heating shapes from NREL. NREL's shapes represent the residential building stock in 2018, so the electric heating mix from 2018 in Jefferson and Fayette counties drives the hourly heating load shapes.

i. See the response to part (a). To the best of the Companies' knowledge, NREL does not specify assumptions regarding standard vs. cold-climate heat pumps in providing the electric heating load shapes.

ii. See the response to part (a). NREL's monthly electric heating shapes are not based upon design temperatures, but they do include separate shapes for standard heating and resistance heating.

iii. The Companies modeled demand response (i.e., dispatchable DSM) programs as supply side resources. Therefore, such programs did not affect the Companies' load forecast, including forecasted peak demands.

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Question No. 25

Responding Witness: Robert M. Conroy / Lana Isaacson / Tim A. Jones

Q-25. Please refer to Exhibit TAJ-1, p. 18: "As was assumed in the 2021 IRP, electric vehicles are assumed to primarily charge at homes and overnight. This should have little impact on the summer peak and minimal impact on the winter peak in the morning."

a. Please describe any support for this assumption.

i. Will the Companies require or incentivize off-peak charging to mitigate the potential peak impacts of EV charging?

A-25.

a. The EV charging profiles and associated impacts on peak demands are consistent with the proposed EV charging DSM program. There are a number of different sources supporting the Companies' assumption.[2]

i. The Companies do not anticipate requiring off-peak EV charging to mitigate the potential of impacting peak periods. However, the Companies will be developing an EV tariff for home and business charging to provide cost-based incentives for off-peak EV charging prior

[2] *See, e.g.*, Idaho National Laboratory, "Plugged In: How Americans Charge Their Electric Vehicles; Findings from the largest plug-in electric vehicle infrastructure demonstration in the world," available at https://avt.inl.gov/sites/default/files/pdf/arra/PluggedInSummaryReport.pdf (accessed Apr. 25, 2023) (indicating more than 80% of charging happens at home, with the vast majority of charging demand occurring between midnight and 4:00 a.m.); The Washington Post, "It's common to charge electric vehicles at night. That will be a problem," (Sept. 22, 2022), available at https://www.washingtonpost.com/climate-environment/2022/09/22/its-common-charge-electric-vehicles-night-that-will-be-problem/ (accessed Apr. 25, 2023) ("That means that around 80 percent of EV charging happens at the owner's home, overnight — when the driver doesn't need the car and can leave plenty of time for a charge."); Boston Consulting Group, "What Electric Vehicle Owners Really Want from Charging Networks" (Jan. 17, 2023), available at https://www.bcg.com/publications/2023/what-ev-drivers-expect-from-charging-stations-for-electric-cars (accessed Apr. 25, 2023).

to or as part of the next base rate case as required in the Commission's June 30, 2021 Order in Case Nos. 2020-00349 and 2020-00350. For customers with EVs who charge their vehicles at home overnight, the Companies' current RTOD-E and RTOD-D tariffs provide optional rate schedules that incentivize these customers to charge overnight to save on their monthly bill. The Companies are also proposing a Peak Time Rebate DSM program where the Companies will notify customers in advance of peak demand events and educate customers on ways to save and shift energy consumption during events. Another program the Companies are proposing is the Optimized Charging DSM program, which allows the Companies to issue signals to qualifying EVs to affect the timing and level of EV charging as a means of active, targeted load management.

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Question No. 26

Responding Witness: Lana Isaacson

Q-26. Please refer to Exhibit LI-1, p. 2: "Achievable potential represents the portion of economic potential assumed to be reasonably achievable in the course of a planning horizon (typically 20 years), given market barriers that may impede customers' participation in utility programs."

a. Please define "reasonably" as used in the cited statement.

b. Please define "market barriers" as used in the cited statement.

c. Is "Achievable Potential" constrained in any way other than by reflecting market barriers? For instance, is Achievable Potential constrained by available budgets?

i. Please provide a list of all factors used in the analysis in addition to market barriers that affected the determination of achievable potential, define each factor, and provide an explanation of how each was applied and the effect it had on the achievable potential.

A-26.

a. Reasonably is used to indicate attainable, moderately forecasted, or not extreme.

b. Market barriers reflect realities in the market. A market barrier is any condition in the market that could discourage adoption of an energy efficient system or equipment, such as the higher cost of such equipment.

c. No. Only Program Potential is constrained by available program budgets.

i. There are no factors other than market barriers that affected the determination of Achievable Potential. See the "Research Approach"

section at the top of page 2 of LI-2.

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Question No. 27

Responding Witness: Lana Isaacson

Q-27. Please refer to Exhibit LI-1, p. 2: "increases in high-efficiency equipment standards, such as changes in ENERGY STAR® specification requirements or the inclusion of new highest efficiency or emerging technologies since the 2016 and 2017 studies were not accounted for in this analysis." Please confirm that the analysis did not incorporate any equipment efficiency improvements that have occurred since the 2016 study was conducted. For any answer other than "confirm" please explain, in detail, what equipment efficiency improvements were incorporated in the analysis.

A-27. Not confirmed. Some efficiency standards were incorporated as described in the list in the paragraph titled "Step 3," on page 4 of Exhibit LI-2.

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Question No. 28

Responding Witness: Lana Isaacson / Stuart A. Wilson

Q-28. Please refer to Exhibit LI-1, p. 2: "this analysis did not entail a measure or fuel cost update or cost-effectiveness model re-run."

a. To the Companies or Cadmus' knowledge, have fuel costs changed since the 2016 study? Please explain.

b. Please provide a table that lists each element of the Companies' avoided costs used in the 2016 study, and which provides the 2016 value and the current value associated with each element.

A-28.

a. Yes. See the response to part (b) concerning the avoided energy cost comparison between the 2016 study value and the value used in the DSM-EE cost-benefit analyses presented in this proceeding.

b. See table below. Note that the 2016 study included avoided capacity cost sensitivity cases of $33, $68, and $100 per kW-year in addition to the base case value of $0.

Avoided Cost Component	2016 Study	Case No. 2022-00402
Energy	$0.030/kWh - $0.037/kWh (20-yr. levelized)[3]	$0.020/kWh - $0.029/kWh (2022-2050 nominal $)[4]
Capacity (levelized $/kW-year)	$0[5]	$136.20[6]

[3] *Electronic Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Certain Existing, Demand-Side Management and Energy Efficiency Programs*, Case No. 2017-00441, Direct Testimony of Gregory S. Lawson, Exhibit GSL-3 at 11, Table 8 (Oct. 10, 2018).
[4] *See* Exhibit LI-6, AvoidedCostsElecCONFIDENTIAL.xls, column G.
[5] Case No. 2017-00441, Direct Testimony of Gregory S. Lawson, Exhibit GSL-3 at 11, Table 8 (Oct. 10, 2018).
[6] *See* Exhibit LI-6, AvoidedCostsElecCONFIDENTIAL.xls, column H. Note that this is the value used in the cost-benefit analyses initially filed in this proceeding. The Companies are providing updated DSM-EE cost-benefit scores contemporaneously with the filing of these responses that use different avoided capacity cost values.

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Question No. 29

Responding Witness: Lana Isaacson

Q-29. Please refer to Exhibit LI-1, p. 3: "it should be noted equipment cost and labor/installation cost have only increased since these studies due to inflation and other market drivers." To the Companies' or Cadmus' knowledge, have costs for all equipment types considered in the analysis "only increased" relative to the efficiency of that equipment? For example, have costs for heat pumps "only increased" without also becoming more efficient? Please explain.

A-29. In general, supply chain disruptions and increased demand from customers has increased equipment and labor costs. The Companies did not specifically analyze every measure in the Potential Study to determine if costs as a function of unit energy consumption have experienced universal relative increases.

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Question No. 30

Responding Witness: Lana Isaacson

Q-30. Please refer to Exhibit LI-1, p. 4: "Step two. Account for end-use equipment turnover since the starting year of the previous studies." Did Cadmus account for customers who are new to the Companies' systems? In other words, does the analysis reflect a growing number of customers?

A-30. No, not as new customers specifically, but rather as part of the sales forecast adjustment. See Exhibit LI-1 at 3:

> **Step one. Adjust the previous 20-year sales forecast to align with the new 2024-2043 horizon.** The previous industrial study had a 2016-2035 horizon, whereas the residential and commercial study had a 2019-2038 horizon. Cadmus calculated an average annual percentage change for the last three years of each study sector by fuel type, building type, vintage, and end-use sales then used these calculations to forecast sales out to 2043.

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Question No. 31

Responding Witness: Lana Isaacson

Q-31. Please refer to Exhibit LI-1, p. 5, regarding LED linear lighting: "the market has largely adopted LED linear lighting technologies. Cadmus projected that not all estimated installations went through the Companies' program, so Cadmus increased the overall saturation of LED linear lighting to align with site visit data collected in other jurisdictions to reflect a more realistic view of the available remaining lighting potential for the Companies."

a. Was all of the site visit data collected in other jurisdictions collected from facilities and customers that did not participate in any energy efficiency programs? Please explain.

b. Please compare and contrast the economic conditions in the in the other jurisdictions with the current economic conditions in the Companies' service territories and explain in what ways they are similar and different.

c. Please describe any adjustments made by Cadmus to the out-of-program installations in other jurisdictions when applying those data to form "a more realistic view of the available remaining lighting potential for the Companies.

A-31.

a. No, the data from other jurisdictions was collected from sites that were selected randomly from that jurisdiction's utility customers (i.e. both participants and non-participants).

b. An economic analysis between the LED linear lighting jurisdiction and the Companies' service territory was not within the scope of the project, and therefore no data for such a compare and contrast review exists without additional analysis.

c. See the response to JI 1-144. Because Cadmus perceived a higher rate of LED

linear lighting program participation and naturally occurring activity in the other jurisdictions' site visit data, Cadmus chose to apply a more conservative LED potential reduction for the Companies' service territory. Cadmus compared other jurisdictions' LED saturation in 2016 to 2020 and then assumed the Companies' potential had only achieved half this amount since the Companies' 2016/2017 potential study through naturally occurring customer adoption. Cadmus then also included the Companies' achieved LED lighting through program offerings from 2016-2023.

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Question No. 32

Responding Witness: Lana Isaacson

Q-32. Please refer to Exhibit LI-1, p. 9, regarding Dominion Energy's recent energy efficiency potential studies: "These studies showed that technical potential as compared to baseline sales declined from 39% (2014) to 35% (2017) to 32% (2020)."

a. Please provide the time frame that each of these studies refers to. In other words, across how many years is the technical potential calculated, in what year does the study period begin, and in what year does it end?

b. Please confirm the 2020 potential study for Dominion Energy Virginia identified a cumulative technical potential of 32%. For any answer other than "confirm" please explain.

c. Please confirm that the current Cadmus analysis identified a cumulative 2043 technical potential of 24.3% - which is roughly three-quarters of the technical potential identified for Dominion Energy Virginia. What accounts for this difference?

A-32.

a. The time frames for the studies are:
2014-2023 (2014)
2018-2027 (2017)
2020-2029 (2020)

b. Confirmed.

c. Confirmed. Cadmus did not conduct the Dominion Energy potential study and did not compare assumptions and inputs.

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Question No. 33

Responding Witness: Lana Isaacson

Q-33. Please refer to Exhibit LI-2, p. 1: "fourteen products were selected to conduct an in-depth analysis to assess the DR potential." Please describe the selection process and provide criteria used in determining which products to select.

A-33. For the Demand Response Assessment, Cadmus and the Companies selected the fourteen products by considering many factors, including market acceptance, regulatory approval, approximate product cost, range of unit-level demand reduction and cost, and product limitations. Cadmus assisted the Companies in the selection process by utilizing its vast experience across the nation.

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Question No. 34

Responding Witness: Lana Isaacson

Q-34. Please refer to Exhibit LI-2, p. 4, Table 2. DLC Products – Summer Market Potential. Are the product potentials illustrated competitive with each other, such that it would not be possible to add the potentials for each to determine a composite total potential for them? Please explain.

A-34. Yes, the potentials listed are not necessarily cumulative as they rely on a finite population. As an example, if a thermostat is controlled via a BYOT program, there is no additional value to control the same AC unit with a switch.

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Question No. 35

Responding Witness: Lana Isaacson / Tim A. Jones

Q-35. Please refer to Exhibit LI-2, p. 6: "Nearly all LG&E and KU customers have electric AC units that can be curtailed during summer events, but less than half have electric heating units (air source heat pumps) that can be targeted for winter event curtailment." Also refer to Exhibit TAJ-1, p.4 "By 2052, electric space heating saturation increases from 2015 levels by 7% in KU's service territory (already highly saturated) and by 33% in LG&E's service territory."

a. Please reconcile the statements that "less than half have electric heating units" and "KU's service territory [is] (already highly saturated) [with electric space heating].

b. The Companies' load forecast anticipates a 33% increase in electric space heating by 2052. Did the Demand Response Assessment account for the potential due to increased saturation of electric space heating? Please explain.

A-35.

a. No reconciliation is necessary. "Less than half have electric heating units" refers to the Companies' *combined* service territories. This includes the LG&E service territory, which currently has a high saturation of natural gas heating and thus a low saturation of electric heating. See Tables 4 and 5 in Section 3.8 of Exhibit TAJ-1. Specifically, see the first row of each table that represents an approximation of electric heating penetration for home vintages 2010 and prior.

b. The first sentence of this request incorrectly summarizes the quote from Exhibit TAJ-1, which states, "By 2052, electric space heating saturation increases from 2015 levels by … 33% in *LG&E's* service territory" (emphasis added). As explained in the response to part (a), LG&E's service territory currently has a low saturation of electric heating, making a 33% increase less impactful in absolute terms than would be a similar percentage increase in

KU's much more saturated service territory. In response to the question whether the Demand Response Assessment accounts for the potential due to increased saturation of electric space heating, the Companies did not use estimates related to space heating.

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Question No. 36

Responding Witness: Lana Isaacson

Q-36. Please refer to Exhibit LI-2, p. B-9, Table B-7. Residential DLC BYOT Input Assumptions: "Winter eligibility based on percent of questionnaire respondents who reported using a heat pump as the primary source of heating for their home."

a. What are the date parameters for when the referenced questionnaire was fielded to customers?

b. Did Cadmus adjust results for recent and expected growth in electric space heating? Please explain.

A-36.

a. The referenced questionnaire was fielded to customers in November 2020.

b. No, the 2023 LG&E and KU Demand Response Assessment did not explicitly estimate a shift in heating fuels due to electrification.

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Question No. 37

Responding Witness: Lana Isaacson

Q-37. Please refer to Exhibit LI-2, p. B-10, Table B-7. Residential DLC BYOT Input Assumptions: "LG&E and KU currently does not offer incentives for smart thermostats, therefore Cadmus assumed smart thermostats saturations conservatively."

a. In Cadmus' view, if LG&E and KU were to offer incentives for smart thermostats would it expect saturations to increase?

b. Is Cadmus aware of program administrators that offer incentives for smart thermostats? Please list all such program administrators of which Cadmus is aware.

c. Did Cadmus assess the potential that could be obtained from a BYOT program in which LG&E and KU provide incentives for customers to purchase smart thermostats? If yes, please provide the results of the assessment. If no, please explain why not.

A-37.

a. The Companies expect the saturation of smart thermostats to increase with an incentive offered.

b. There are several program administrators that offer incentives for smart thermostats, including the other PPL Corporation utilities. Lists of smart thermostat incentives from program administrators are available from EnergyStar and the NC Clean Energy Technology Center at the following URLs:

https://www.energystar.gov/rebate-finder?scrollTo=444&sort_by=utility&sort_direction=asc&page_number=0&lastpage=0&zip_code_filter=&find_rebates=Find+Rebates&search_text=s

mart+thermostat&product_clean_isopen=&product_types=Select+a+Product+Category

https://programs.dsireusa.org/system/program

c. No, Exhibit LI-2 focused on the demand response value of existing smart thermostats. The market potential for the Res DLC BYOT product in the assessment is an option for the utility to manage the customer's enrolled (but already purchased) smart thermostat.

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Question No. 38

Responding Witness: Lana Isaacson

Q-38. Please refer to Exhibit JB-1, p. 9: "Offer integrated efficiency and demand response incentives and focused promotional campaigns for products, such as smart thermostats, that provide both energy savings and direct load management capabilities." Do the Companies plan to offer incentives for smart thermostats? If yes, please describe the incentive amount and implementation approach the Companies propose to employ.

A-38. See Exhibit JB-1, p. 28 and p. 46.

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Question No. 39

Responding Witness: Lana Isaacson

Q-39. Please refer to Exhibit LI-2, p. 8, footnote 8: "The benefit/cost ratios following the Total Resource Cost (TRC) test methodology to assess product cost effectiveness."

a. Did Cadmus also determine Utility Cost Test ("UCT") results for the Demand Response programs?

b. If yes, please provide these results and supporting workpapers in native format with formulas intact.

A-39.

a. No, only TRC was calculated for the Demand Response programs.

b. Not applicable.

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Question No. 40

Responding Witness: Lana Isaacson / Tim A. Jones / Stuart A. Wilson

Q-40. Please refer to Exhibit LI-2, p. 12: "Cadmus applied a ten percent risk factor to avoid overestimating savings of program achievements and other unforeseen barriers (e.g., customer acceptance)."

a. What empirical evidence did Cadmus rely on to determine that a 10% downward risk adjustment is warranted? Please provide citations to all sources and explain the basis of this adjustment.

b. Admit that program potentials can also be underestimated. For any answer other than "admit" provide evidence to support the answer.

c. In Cadmus' view, are there risks associated with underestimating program potential? Please explain.

i. For example, is there a risk that underestimating program potential could lead to infrastructure or energy/capacity investments that might not have been needed? Please explain.

A-40. Note that all references to Exhibit SAW-1 herein and throughout the Companies' responses are to the updated May 2023 Exhibit SAW-1 provided in response to JI 2-60(a).

a. The factor was used to lower the risk of overestimating potential savings in the shortened time period (by Summer 2025 and 2028) as identified in Exhibit LI-2.

b. Program potentials can be underestimated or overestimated. Program potentials are forecasts of future outcomes using available data and can differ from actual outcomes.

c. Risks of underestimating program potential include oversubscribing programs and having to potentially suspend the program, having to refile the plan, and reevaluating incentive structures to balance the supply of program services with the demand for those services.

i. Not in this case. As demonstrated in Exhibit SAW-1 Section 4.4.1, PLEXOS selected no dispatchable DSM as a cost-effective resource to serve customers' needs and meeting minimum reserve requirements. Dispatchable DSM proved to be a cost-effective means of providing incremental additional reliability only in the last stage of the Companies' analysis, at which point the supply-side portfolio was fully established (with the exception of the Brown battery energy storage system). This result is unsurprising: the Companies' proposed economic coal unit retirements create a future need for around-the-clock energy, particularly at night, which dispatchable DSM cannot fully satisfy.

Regarding non-dispatchable DSM-EE, the Companies have already made aggressive energy-efficiency savings assumptions in their load forecast. There is no reasonable basis for assuming any additional energy-efficiency savings, at least in the near future (i.e., by 2028). See also the response to Question No. 20.

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Question No. 41

Responding Witness: Lana Isaacson

Q-41. Please refer to Exhibit LI-2, p. A-1: "Technical potential assumes 100% participation of eligible customers in all programs included in the assessment. Hence, technical potential represents a theoretical limit for unconstrained potential."

a. Please provide a table showing each product assessed and the associated technical potential as determined by Cadmus.

b. Please indicate the method used in determining the technical potential for each product and providing supporting workpapers in fully functional electronic format.

A-41.

a. The table used to create the graphs shown in the assessment document for Figures C-1 through C-6 is shown in the document Demand Response Assessment Potential. See attachment being provided in Excel format.

b. Appendix A of the assessment document outlines the methodology and Tables B-1 through B-22 in the assessment document provide the input assumptions for each of the programs included in the assessment.

The attachment is being provided in a separate file.

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Question No. 42

Responding Witness: Lana Isaacson

Q-42. Please refer to Exhibit LI-2, p. A-1: "Market potential reflects a subset of technically feasible DR opportunities we assumed to be reasonably obtainable, based on market conditions and the end-use customers' ability and willingness to participate in the DR market."

a. Please define "reasonably obtainable" as used in the referenced statement.

b. Please provide the criteria used to determine "reasonably obtainable" and explain how the criteria were applied in making the determination.

A-42.

a. See the response to Question No. 26(a).

b. Exhibit LI-2 outlines the criteria used following the referenced sentence on page A-1 and further onto page A-2.

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Question No. 43

Responding Witness: Lana Isaacson

Q-43. Please refer to Exhibit JB-1, p.26: "Customers who receive smart thermostats through Income-Qualified Solutions will be directly enrolled in the Bring-Your-Own-Device subcomponent of Connected Solutions. Demand reduction resulting from load control events will be captured through Connected Solutions, and direct enrollment through Income Qualified Solutions will increase overall participation in the Companies' demand conservation offerings." Please also refer to Exhibit JB-1, p. 46: "**BYOD subcomponent.** Beginning in 2024, the Companies will offer customers an incentive of up to $50 for enrolling a smart thermostat and up to $10 for each event in which their device participates (up to 25 events per year)…. A maximum incentive of $300 per device in the first year of participation and $250 per device in each year thereafter."

a. Will Income-Qualified Solutions participants be able to opt-out of BYOD direct enrollment?

b. Will the Companies provide the $50 enrollment incentive to Income-Qualified Solutions participants who are directly enrolled in the BYOD subcomponent?

c. Will the Companies provide the per event incentives to Income-Qualified Solutions participants who are directly enrolled in the BYOD subcomponent?

A-43.

a. Yes.

b. Yes.

c. Yes.

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Question No. 44

Responding Witness: Robert M. Conroy

Q-44. Please refer to the Companies' response to MCFC 1-29.f. For 2020, 2021, and 2022, please provide the actual average monthly energy use for each month of the calendar year in each of the utility categories provided in the referenced response to MCFC 1-29.f.

A-44. See the table below.

	KU	LG&E			
		Electric Only Customers	Gas Only Customers	Elec/Gas Combined Customers	
	kWh	kWh	CCF	kWh	CCF
2020					
January	1,347	1,128	89	791	98
February	1,338	1,138	94	715	104
March	1,189	1,003	85	682	88
April	934	784	48	699	50
May	873	702	33	694	37
June	1,021	810	17	1,094	18
July	1,273	974	9	1,492	12
August	1,266	915	9	1,419	11
September	1,136	849	9	1,256	12
October	802	633	14	756	17
November	822	699	32	673	41
December	1,280	1,042	69	796	86

	KU	LG&E			
		Electric Only Customers	Gas Only Customers	Elec/Gas Combined Customers	
	kWh	kWh	CCF	kWh	CCF
2021					
January	1,606	1,380	113	907	126
February	1,645	1,436	120	844	135
March	1,332	1,125	97	733	96
April	901	725	48	641	46
May	788	645	26	681	28
June	977	767	14	1,051	15
July	1,194	903	9	1,365	12
August	1,216	905	9	1,409	11
September	1,147	876	9	1,288	12
October	813	655	11	840	14
November	897	735	31	704	45
December	1,218	1,001	74	766	84
2022					
January	1472	1259	94	836	111
February	1571	1372	115	799	128
March	1189	1021	83	696	84
April	952	795	57	635	57
May	832	680	24	756	25
June	1043	814	11	1,142	13
July	1288	946	9	1,458	11
August	1192	886	8	1,365	10
September	1065	811	9	1,173	11
October	816	620	15	733	18
November	832	705	35	629	43
December	1268	1096	76	788	94

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Question No. 45

Responding Witness: John Bevington

Q-45. Please identify each specific customer benefit, including non-energy benefits, that (a) were considered as part of the initial screening of DSM/EE programs, and (b) were included in the cost-effectiveness testing of DSM/EE programs.

A-45. See Exhibit JB-1, Appendix C, Table C-1, p. 60 for the benefits that were considered as part of the initial screening of DSM/EE programs. See Exhibit JB-1, Table 1-3, p. 19 for the benefits included in the cost-effectiveness testing of DSM/EE programs.

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Question No. 46

Responding Witness: Tim A. Jones / Stuart A. Wilson

Q-46. Please refer to the Companies response to JI 1.28a, which states, "The following are examples of rate schedules and programs the Companies have implemented to reduce the level of peak demands, which have the effect of dampening load swings: TOD rates, CSR, and non-dispatchable and dispatchable DSM programs."; and answer the following requests.

a. Do the companies agree that energy efficiency can also dampen peak demand (e.g. if buildings are more energy efficient, then less adjustment is needed to respond to temperature swings)? If not, please explain why not.

b. Have the Companies performed any resource optimization modeling to evaluate the potential for increased energy savings through energy efficiency programs to cost-effectively reduce peak demand? If so, please provide the results of each such modeling analysis, including supporting workpapers with formulas intact.

c. Please explain how analyses identified in response to subpart (b) were incorporated in the resource assessment, the initial screening of DSM/EE programs, and/or the cost effectiveness testing of DSM/EE programs?

A-46.

a. Yes. A significant level of peak demand reductions related to non-dispatchable DSM and customer-initiated energy efficiency improvements is included in the load forecast. See the response to Question No. 16(b).

b. No. Only the existing and proposed dispatchable DSM programs were evaluated as potential resources in PLEXOS.

c. Not applicable. See the response to part (b).

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Question No. 47

Responding Witness: Stuart A. Wilson

Q-47. Please refer to the file contained in SAW-2 workpapers entitled "BuildCost_GasTransmission".

a. Do these costs represent firm gas transmission costs to each of these units? If not, what do they represent?

b. Please explain why some of the values are negative.

c. Please provide with all formulas and links intact and changing nothing, the spreadsheet(s) used to create these values.

A-47.

a. No. These costs represent the present value of revenue requirements in dollars per kW associated with incremental transmission capital associated with each of the respective generating units.

b. See the response to PSC 2-53(a-b).

c. See the response to part (b).

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Question No. 48

Responding Witness: Stuart A. Wilson

Q-48. Please provide in spreadsheet format the hourly load, in MW, for the KU/LGE LSE in each of 2022 and 2021. If the load is not net of demand response, please provide the level, in MW, of demand response called in each hour, if applicable.

A-48. See attachment provided in Excel format. The data is net of demand response.

The attachment is being provided in a separate file.

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Question No. 49

Responding Witness: Stuart A. Wilson

Q-49. Please refer to the Companies response to SC 1-5(a), stating that "[n]o workpapers were provided for the adjustments" to the neighboring regions' generating portfolios as needed to reflect planned retirements and meet the neighboring regions' target reserve margins. With respect to this statement, please answer the following:

a. Please explain, in the absence of any workpapers, how the Companies decided which "existing dispatchable resources [to deactivate]".

b. Please explain why only the resources needed to meet the reserve margins specified were included in the neighboring regions.

c. What resource types were excluded from the category "existing dispatchable resources"? Please explain why these resource types were excluded.

d. Please provide any documents, spreadsheets, and/or other workpapers that support your response to subparts (a) – (c).

A-49.

a. For each neighboring region, the Companies calculated the amount of generation capacity needed as a function of the region's forecasted peak load in 2028 and target reserve margin. The Companies then achieved that level of generation by selecting or deselecting existing thermal generation resources in the SERVM interface. The selection or deselection usually involves only a small number of thermal resources to adjust existing portfolios to meet the target reserve margins.

b. The Companies assumed that each neighboring region will meet its target reserve margin in 2028. Because the size of generation resources vary, the target reserve margins are not assumed to be met exactly. The Companies do

not have a basis for assuming that each neighboring region will have a reserve margin significantly greater or less than its target reserve margin.

c. The Companies selected or deselected only thermal resources to achieve target reserve margins in neighboring regions. Thermal resources account for the largest share of capacity in neighboring regions.

d. A simple spreadsheet to calculate amount of generation capacity for part (a) was provided in "\Reliability\SERVM\Inputs\NeighboringUnits\20221121_Resourcesfor RM.xlsx" in Exhibit SAW-2.

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Question No. 50

Responding Witness: John Bevington / Robert M. Conroy

Q-50. Please refer to the Companies' response to PSC 1-38. Please provide any documents in the Companies' possession related to communication between the Companies and BlueOval about potential participation in interruptible service.

A-50. The Companies development teams discussed BlueOval SK's interest in participating in interruptible service through meetings and conversations. During these discussions BlueOval SK representatives indicated their lack of interest in interruptible service and confirmed their desire for firm power. See the document provided in response to Question No. 51, which is also responsive to this request. Also, BlueOval SK's desire for firm power is documented in the special contract referenced in response to PSC 2-43 under Article V Firm Power.

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Question No. 51

Responding Witness: John Bevington / Robert M. Conroy

Q-51. Please refer to the Companies' response to JI 1-89. Please provide the documentation that demonstrates that "Blue Oval SK has indicated that it does not desire any part of its load to be interruptible, and it intends to have round-the-clock operations, resulting in a very high load factor

A-51. See the special contract referenced in response to PSC 2-43. Article V Firm Power documents BlueOval SK's desires for firm power. In addition, paragraph 5 of the Recitals indicates "Customer's manufacturing operations will consist of two new plants for the manufacture of electric vehicle batteries to be constructed at the Glendale Megasite, with an expected combined demand of 260 MW and monthly load factors exceeding 95 percent." Finally, see the attached.

The attachment is being provided in a separate file.

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Question No. 52

Responding Witness: John Bevington / Robert M. Conroy

Q-52. Regarding BlueOval SK's load, please answer the following.

a. When did BlueOval SK first approach the Companies about the possibility of taking electrical service?

b. When did BlueOval SK sign the agreement

A-52.

a. The BlueOval SK project started evaluating Kentucky as a location during the first and second quarters of 2021. The possibility of electric service would have been a function of that evaluation.

b. See the response to PSC 2-43.

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Question No. 53

Responding Witness: Robert M. Conroy / John Bevington

Q-53. Please refer to the Companies' response to PSC 1-31(d), and answer the following requests.

a. Do the Companies expect that Blue Oval will pay the full cost of the contract for the 300 MW of renewable energy?

b. If the answer to subpart (a) is no, please explain why not.

c. If the answer to subpart (a) is no, please explain how the Companies will apportion the cost of the contract between the various rate classes.

d. Have the Companies sought to make 300 MW of the solar projects listed on page 6 of Mr. Crockett's testimony the source of energy that would be subject to this agreement?

e. If the answer to subpart (d) is no, please explain why not.

f. If the answer to subpart (d) is yes, please explain why this contract is not part of the present application to the Commission.

g. Please provide any documents that support your responses to the proceeding subparts.

A-53.

a. Yes. See the response to PSC 2-43. If BlueOval SK and KU enter into such a contract, the terms of such contract shall permit the energy produced and delivered pursuant to such special contract to offset the amount of the peak and intermediate demand, coincident with the solar production, delivered and billed in the special contract.

b. Not applicable.

c. Not applicable.

d. No.

e. The solar projects listed as part of Mr. Crockett's testimony are part of the overall generation resource plan to serve the needs of the entire system.

f. Not applicable.

g. See the response to PSC 2-43.

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Question No. 54

Responding Witness: Tim A. Jones

Q-54. Please provide, with all formulas and links intact, changing nothing, the workbook(s) used to derive the data in "20221028_LGELoad2028.csv".

A-54. See Exhibit TAJ-3 at Hourly_Forecast_Updates/WY. The file is based on the 2028 subset of the Weather Years process output. See also the response to Question No. 60.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's
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Case No. 2022-00402

Question No. 55

Responding Witness: Stuart A. Wilson

Q-55. Please provide all SERVM and PLEXOS workpapers created by the Companies in producing the 2021 IRP.

A-55. The requested information was provided to the Joint Intervenors in the 2021 IRP case and is produced to the Joint Intervenors in this case with the files produced in response to Question No. 63. The Companies did not provide a SERVM database .bak file for the 2021 IRP, and they do not have such a file now. The file can no longer be created. The .bak file is a backup file of the SERVM database that is created from the Companies' SERVM server computer. If the file is not created at that time, then it cannot be retroactively created because of the continuous changes to the database for future runs. Weekly backup runs are created, but they are retained only for one month.

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Case No. 2022-00402

Question No. 56

Responding Witness: Stuart A. Wilson

Q-56. Please refer to the PLEXOS file entitled "Maintenance Schedule", and answer the following requests.

a. Please explain why no values for the proposed NGCCs are given.

b. How is planned maintenance accounted for these units?

c. What is the anticipated maintenance schedule for the units?

A-56.

a. See the response to PSC 1-43, page 2.

b. See the response to part (a).

c. See the response to part (a).

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Question No. 57

Responding Witness: Stuart A. Wilson

Q-57. With respect to the forced outage rate for the proposed NGCCs in PLEXOS, please answer the following requests.

a. Did the Companies model a forced outage rate for the proposed NGCCs in PLEXOS?

i. If not, please explain why not in full?
ii. If so, how was the forced outage rate modeled?

b. What forced outage rate is anticipated for each of the proposed NGCCs?

A-57.

a. Yes. See the response to PSC 1-43, page 2.

i. See the response to part (a).
ii. See the response to part (a).

b. The Companies assume an equivalent unplanned outage rate of 6.6% for the proposed NGCC units.

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Question No. 58

Responding Witness: Stuart A. Wilson

Q-58. Section 6 of SAW-1 states, "Brown Solar's ownership was assigned by allocating its forecasted generation in each hour based on each company's forecasted share of native load energy requirements for the hour" and "[t]he new solar resources were assigned to each company using a method similar to the method used for Brown Solar."

a. Please confirm that this methodology was implemented within the SERVM interface and did not serve as an adjustment to the load contained in the file "20221028_LGELoad2028".

b. If subpart a is not confirmed, please provide a version of "20221028_LGELoad2028" that does not contain the adjustment for solar projects.

A-58.

a. Solar is modeled as a resource in SERVM and not as an adjustment to load. Unit ownership is neither useful nor relevant in SERVM.

b. See the response to part (a).

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Case No. 2022-00402

Question No. 59

Responding Witness: Stuart A. Wilson

Q-59. Please refer to the PLEXOS file entitled "MinCapacityReserves_2023BPLoad_IRA_DSM_20221026_24WRM".

a. Does PLEXOS optimize to the values in this file or to the reserve margin requirements set by LG&E?

b. If both are used, please explain how.

c. How were these values determined? Please provide the workbook(s) with all formulas and links intact showing how they were derived.

A-59.

a. PLEXOS models that used only an annual minimum winter reserve margin constraint used the values in this file, which are consistent with a 24% winter reserve margin, by resolving to a corresponding minimum capacity reserve level in MW. This method was required to resolve to a winter minimum reserve margin target based on a summer peaking load forecast.

PLEXOS models that used either an annual summer reserve margin constraint or a seasonal (i.e., both winter and summer) reserve margin constraint did not use the MW values in this file. Instead, those models used the 17% summer and 24% winter minimum reserve margin targets directly.

b. See the response to part (a).

c. The minimum winter capacity levels were determined by calculating the amount of winter-rated capacity that is needed above the summer peak load to achieve a 24% winter reserve margin. These values were calculated

directly in the referenced file based on the load forecast, the minimum reserve margin targets, and the spreadsheet formulas included explicitly therein.

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Case No. 2022-00402

Question No. 60

Responding Witness: Tim A. Jones / Stuart A. Wilson

Q-60. Regarding the files "20221028_LGELoad2028" and "Load2023PlanCC_IRA_DSM_20221026" please answer the following:

a. Please explain why the annual energy requirements in "Load2023PlanCC_IRA_DSM_20221026" fall below the energy requirements for all the weather years in "20221028_LGELoad2028".

b. Please explain why 31 of the 49 weather years in "20221028_LGELoad2028" contain annual peak values in excess of the 2028 peak contained in "Load2023PlanCC_IRA_DSM_20221026", i.e, why is the distribution of load modeled in SERVM distorted to the high side relative to the base load forecast?

c. Please provide any workbooks that support your response to the previous subparts with all formulas and links intact, changing nothing.

d. Please provide the workbooks with all formulas and links intact, changing nothing, that show how the hourly load shapes in "20221028_LGELoad2028" were updated from the 2021 IRP to the present docket.

A-60.

a. Weather year energy requirements inadvertently double counted forecast items that are layered onto the hourly forecasts separately due to their unique load shape. These "unique forecast items" include electric vehicle growth, distributed solar growth, and most significantly the BlueOval SK load. Fortunately, this double counting did not have a material impact on the weather year summer and winter peak demands and had no effect on the Companies' optimal resource portfolio or projected revenue requirements, which are based on the Companies' load forecast under normal weather conditions and not the weather year forecasts.

The weather year forecast models are specified for each company based on load data from 2012 to 2019 and cannot account for class-specific forecast trends in the base CPCN load forecast. In addition, the weather year forecast models cannot capture the unique impact of items like electric vehicle growth, distributed solar growth, and the addition of the BlueOval SK load. Therefore, the initial weather year load forecast results are scaled so that the mean of weather year energy requirements equals a version of the normal weather CPCN load forecast that excludes these "unique forecast items," and then these items are layered onto the forecast separately (a detailed summary of this process is attached as Attachment 1 to this response). The double counting of the BlueOval SK load occurred because the initial weather year load forecasts were inadvertently scaled to a version of the CPCN load forecast that included these unique forecast items, and then these items were effectively layered on a second time.

In the final step of the weather years process, the Companies tie the mean of the weather year summer and winter peaks to the CPCN forecast peaks through seasonal load factor adjustments that impact the distribution of peak demands but do not change total energy. Thus, the process produced a reasonable distribution of peak demands, but average weather year energy requirements and load factors were approximately 5.8% too high. The Companies did not detect this problem because an assessment of reliability and the calculation of LOLE in SERVM is significantly focused on peak events, and the Companies' review process was therefore focused on summer and winter peak demands, not annual energy requirements. The Companies have updated their review process to ensure this kind of error does not occur in the future.

Figure 1 compares the original and corrected ranges of peak demands and energy requirements at key steps in the weather years process. After scaling the initial weather year forecasts to equal CPCN energy requirements that exclude unique forecast items, the corrected ranges of peak demands and energy requirements are lower than the original (see "Energy Requirements Scaling" step in Figure 1). For both the original and corrected ranges, the impact of layering on the unique forecast items is the same (see "Addition of Unique Items" step in Figure 1). Finally, because of the double counting, the seasonal load factor adjustments in the original weather year forecasts are greater than in the corrected forecasts (see "Load Factor Adjustment" step in Figure 1). As a result, the corrected distributions of summer and winter peak demands are not materially different from the originals, but the corrected distribution of energy requirements is approximately 5.8% lower. Figure 2 contains the filed and corrected load duration curves for all weather years and further demonstrates that the impact of this correction is greater in non-peak hours.

Figure 1 – Weather Year Energy Requirements and Peak Demands[7]

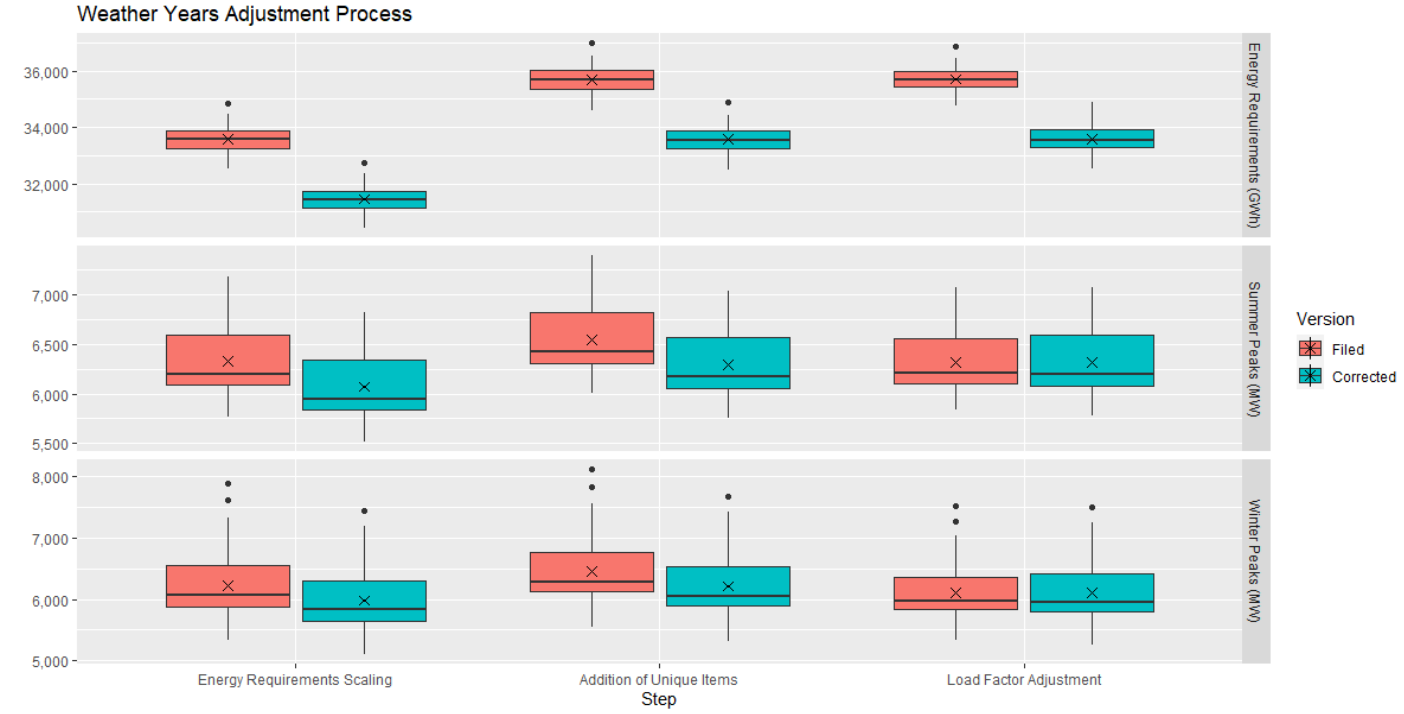
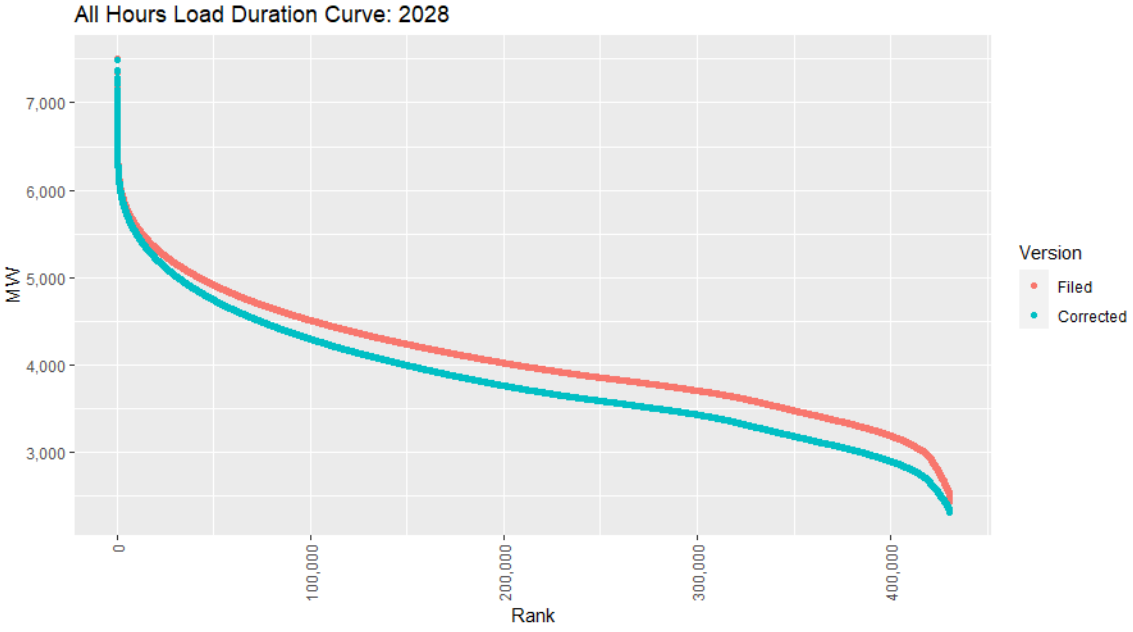


Figure 2 – All Weather Years Load Duration Curve: 2028



[7] In Figure 1, the mean is marked with an "X."

Table 1 compares the original and corrected distributions of peak demands by quartile.[8] The seasonal load factor adjustment has a greater impact on hourly loads that are further from the mean, and a downward adjustment, as seen in the last two steps of Figure 1 for the filed version, has the effect of compressing the distribution of peak demands. With a smaller load factor adjustment, the corrected peak demand distributions are slightly less compressed. This is why the average of the top quartile demands in the corrected distributions are slightly higher than the original distribution. These minor differences are important to understand when assessing the impact of the corrected weather year forecasts on the Companies' analysis.

Table 1 – Weather Year Peak Demands by Quartile (MW)

Season	Quartile	Filed	Corrected	MW Change in Average Peak	% Change in Average Peak
Summer	**1**	6,751	6,801	50	0.74%
	2	6,361	6,369	8	0.12%
	3	6,166	6,148	-18	-0.29%
	4	6,024	5,987	-36	-0.61%
Winter	**1**	6,824	6,889	65	0.95%
	2	6,151	6,166	15	0.24%
	3	5,905	5,889	-17	-0.29%
	4	5,581	5,523	-58	-1.04%

Weather year load forecasts are key inputs to the Companies' minimum reserve margin analysis, the analysis to determine capacity contributions for limited-duration resources, the Stage Three, Step Two analysis that assesses dispatchable DSM and the Brown BESS as a means of increasing reliability, the Stage Three, Step Three analysis that assesses early retirement risk for OVEC, and the analysis that estimates LOLE for an all-DSM portfolio. An updated version of Exhibit SAW-1 is provided as Attachment 2 to this response. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection. The corrected weather year forecasts impact only selected values in Appendix C (All-DSM Portfolio Analysis), Appendix D (Reserve Margin Analysis), and the Stage Three analysis. All updates are highlighted in blue.

[8] The 49 peaks for each season were ranked in descending order (the highest value given rank 1) and divided into quartiles of 12 with the bottom quartile containing 13 points. The value in the table represents the average of the peaks for each quartile. Values in the MW Change column may appear inaccurate due to rounding.

As noted earlier, the corrected weather year profiles had no impact on the Companies' optimal portfolio or projected revenue requirements, which are based on the Companies' load forecast under normal weather conditions and not the weather year forecasts. The following provides a summary of why this is true:

No Impact to Minimum Reserve Margin Targets

Minimum reserve margins are determined as the reserve margin at which an increase in load would cause the reliability and production cost benefits of adding SCCT capacity to exceed the cost of this capacity. The downward shift in the corrected weather year energy requirements reduced production costs in all weather year scenarios, but with only minor changes to the distributions of peak demands, there was only a small impact on reliability costs and no impact on the minimum reserve margin targets (i.e., the reserve margin at which SCCT capacity becomes economic).

Immaterial Impact to Capacity Contributions

Table 2 summarizes the impact of the corrected weather year forecasts on the capacity contributions for limited-duration resources. Capacity contribution for a limited-duration resource is computed as the ratio of that resource's impact on LOLE to the impact of a like-amount of SCCT capacity. With the corrected weather year forecasts, LOLE for the Reference portfolio is lower (i.e., LOLE for the Reference portfolio is 21.32 versus 25.13), but the capacity contributions of 4-hour and 8-hour battery storage are mostly unchanged. Unlike battery storage, the capacity contribution of dispatchable DSM is notably lower because the availability of dispatchable DSM is limited to only 100 hours and the top quartile of peak demands in the corrected weather year forecasts are slightly higher. Because the updated capacity contributions are immaterially lower for battery storage and because dispatchable DSM was not selected by PLEXOS in the Stage One or Stage Two analyses, the updated capacity contributions will have no impact on the rest of the Companies' analysis.

Table 2 – Filed and Corrected Capacity Contributions

	LOLE (Days in 10 Years)		LOLE Reduction (Days in 10 Years)		Capacity Contribution	
	Filed	Corrected	Filed	Corrected	Filed	Corrected
1: Reference	25.13	21.32	NA	NA	NA	NA
2: Reference + SCCT	3.87	3.57	21.26	17.75	NA	NA
3: Reference + 4-hr BESS	6.98	6.72	18.15	14.60	0.85	0.82
4: Reference + 8-hr BESS	5.13	4.88	20.00	16.44	0.94	0.93
5: Reference + Disp. DSM	10.49	15.14	14.64	6.18	0.69	0.35

Dispatchable DSM Remains the Most Economical Means of Enhancing Reliability

The Stage One and Two analyses and the analysis of capacity contributions summarized in Table 2 above demonstrate that dispatchable DSM is not a cost-effective means of meeting minimum reserve margin targets or customers' significant need for energy resulting from the retirement of coal units. However, at higher reserve margins where LOLE is lower and explained by fewer peak events, the limited availability of dispatchable DSM is less of a concern and dispatchable DSM continues to be a more cost-effective resource for improving reliability than SCCT or battery storage.

No Change in Conclusions to OVEC or All-DSM Analyses

As seen in Section 4.6.3 and Appendix C of the updated Exhibit SAW-1, the corrected weather year profiles have no impact on the conclusions reached regarding the implications of an early OVEC retirement or an all-DSM portfolio. The recommended portfolio will provide excellent reliability if OVEC retires early. Furthermore, with no replacement resources other than the proposed 2024-2030 DSM-EE Program Plan's dispatchable DSM programs, the Companies' LOLE is unacceptably high.

b. For the base load forecast, the Companies model peaks by season. Under normal peak weather conditions, the annual peak is expected to occur during the summer. However, from a load risk perspective, the Companies' system is dual peaking. Thirty-one of the 49 weather years contain annual peaks in excess of the 2028 summer peak demand under normal weather conditions because a number of the annual peaks are winter peaks. When evaluated on a seasonal basis, more than 50% of summer and winter weather year peaks are less than the 2028 summer and winter peak demands under normal weather conditions. Figure 1 provided in part (a) shows that for peaks in each season of each version of the weather year forecast, the median is below the mean, supporting the statement above that more than 50% of peaks in the distributions are below the mean.

c. See attached. Certain responsive files are too large for the Companies to upload to the Commission's website and are the subject of a Motion to Deviate being filed with these responses. Also, certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

d. For any confidential workpapers relating to the IRP weather years forecast, see the response to Question No. 63. The public workpapers the Companies provided in response to JI 1-3 in Case No. 2021-00393 are available at https://highq.in/ous6sqhwi9.

The attachments are being provided in separate files.

Q60(a) Attachment 2 and Q60(c) are confidential and provided separately under seal.

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Dated April 14, 2023

Case No. 2022-00402

Question No. 61

Responding Witness: Charles R. Schram / David S. Sinclair

Q-61. Response to PSC 1-27 states, "The Companies' quantification of solar project execution risk is in Exhibit SAW-1, Section 4.6.1. Indeed, until December 2022, the largest solar installation in Kentucky today remains the Companies' E.W. Brown Solar Facility (10 MW), notwithstanding numerous Siting Board approvals and Commission approvals related to much larger solar facilities in recent years. For example, the Companies have executed two solar PPAs for true utility-scale solar PPAs (100 MW Rhudes Creek in 2019 and 125 MW Ragland in 2021), yet neither project has received all necessary approvals, and neither is on schedule or has begun construction. The Companies are not alone: Big Rivers Electric Corporation ("BREC") received Commission approval for three solar PPAs in September 2020. BREC has received termination notices for two of the contracts, and the facility for the third is not yet operational. Regarding Siting Board approved solar projects, it appears that 24 merchant solar projects have been approved by the Siting Board, but only one is in operation and one is under construction. Therefore, solar project execution risk is real, and the Companies have quantified the possible impact of it in their analysis in this proceeding."

a. What approvals are the Rhudes Creek and Ragland projects missing?

b. When did Rhudes Creek and Ragland apply for these missing approvals?

c. Why, in the Companies' judgement, are the approvals missing?

d. Please explain why Company ownership would have mitigated the absence of approvals for these projects.

e. Regarding the Big Rivers experience, please explain why utility ownership, but not a price reopener clause, would have mitigated the possibility of termination notices.

f. Regarding the 24 solar projects that have been approved by the Siting Board, please provide all documents in the Companies' possession that demonstrate the projects that have yet to start construction or operation are behind schedule.

g. Regarding the 24 solar projects that have been approved by the Siting Board, but have yet to start construction or operation, please explain each factor leading to this status that would have been mitigated by utility ownership.

h. Do the Companies intend to hire an engineer, procure, construct ("EPC") firm to build the Mercer County project? If not, how will construction of and procurement of equipment and labor for the project be conducted?

A-61.

a. See the response to MCFC 1-67.

b. Rhudes Creek initially sought local approvals in November 2020. The Ragland developer has held ongoing discussions with local planning and zoning authorities, but has not formally applied for approvals.

c. The Companies have observed through media reports that obtaining local approvals for siting solar projects has been challenging in part due to local opposition to solar facilities. Columbia Law School's Sabin Center for Climate Change Law has published details on opposition to renewable projects across the U.S.[9]

d. See the response to MCFC 1-47 and Sinclair testimony Exhibit DSS-1.

e. See Sinclair testimony at page 23.

f. The Companies are only aware of one project receiving Siting Board approval that has achieved commercial operation. The 70 MWDC Turkey Creek project in Garrard County was completed in December 2022.[10]

g. The Companies do not have sufficient knowledge of the projects approved by the Siting Board to answer this request. See Section 5 of the Sinclair testimony for the Companies' view on the general development and operational advantages of owned solar.

h. Yes, the Companies intend to hire an EPC firm for the Mercer County Project.

[9]https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1186&context=sabin_climate_change
[10] https://iea.net/Projects/Turkey-Creek#:~:text=Located%20in%20Garrard%20County%2C%20Kentucky,Watt%20Series%206%2B%20photovoltaic%20modules.

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Question No. 62

Responding Witness: Stuart A. Wilson

Q-62. Regarding Exhibit SAW-1, Section 4.6.1, please answer the following:

a. Why did Portfolio 12 not include the other solar projects discussed in Mr. Crockett's testimony that the Companies intend to seek contracts with?

b. Did the Companies model a portfolio that included all the new projects discussed in Mr. Crockett's testimony? If not, why not?

c. If the answer to subpart b is yes, please provide the PROSYM files associated with this run.

A-62.

a. Portfolios 11 and 12 were sensitivities to assess mitigating the solar PPA execution risk and hence did not include the solar PPA projects.

b. Yes, Portfolio 14 in the Financial Model contains all the solar PPA projects, the Marion and Mercer solar assets, and Brown BESS.

c. The PROSYM files associated with these runs are available at "\CONFIDENTIAL_03_PROSYM\Phase3\CaseFolders\E14\" in Exhibit SAW-2.

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Case No. 2022-00402

Question No. 63

Responding Witness: Stuart A. Wilson

Q-63. Please provide a copy of all confidential workpapers and discovery responses submitted by the Companies as part of Case No. 2021-00393.

A-63. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection. See the response to Question No. 55.

The attachments are confidential and provided separately under seal.

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Case No. 2022-00402

Question No. 64

Responding Witness: Stuart A. Wilson

Q-64. Regarding the PLEXOS file "MinCapacityReserves_2023BPLoad_IRA_DSM_20221026_24WRM" please answer the following.

a. Why did the Companies model these values rather than a winter 24% planning reserve margin target?

b. Please provide the workbooks with all formulas and links intact, changing nothing, that show how the values in this workbook were created.

c. Please explain why these values were not applied to all models, e.g. Model 7 used a different reserve margin requirement.

A-64.

a. See the response to Question No. 59(a).

b. See the response to Question No. 59(c).

c. See the responses to Question No. 59(a) and SC 2-4(c).

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Case No. 2022-00402

Question No. 65

Responding Witness: Stuart A. Wilson

Q-65. Regarding the PLEXOS files "FirmCapacityWinter" and "FirmCapacityMonthly", please answer the following.

a. Please explain why the Companies used these values rather than the values in "FirmCapacityMonthly_22RFP". What are the values in this spreadsheet intended to represent?

b. Please explain why solar is given no accredited capacity and provide the documents that serve as the basis for your response.

A-65.

a. The "FirmCapacityWinter" and "FirmCapacityMonthly" files include firm capacity values for the Companies' existing units, previously planned solar PPAs, and the Mill Creek and Brown NGCC and SCCT resource proposals.[11] The "FirmCapacityMonthly_22RFP" represent firm capacity values for only the renewable and battery RFP resources. The Companies used separate files for these resources to simplify the workflow of updating PLEXOS input data.

b. Solar is assumed to contribute 78.6% of its capacity in the summer and zero in the winter, when the peak typically occurs before sunrise and solar irradiance is zero. See the responses to PSC 2-64(b) and (c) and SC 2-35.

[11] The following generic resources were also included in these files but were not used in this analysis: NewNGCC, NewSCCT, NewNGCC-CCS, NewSolar, and NewWind.

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Case No. 2022-00402

Question No. 66

Responding Witness: Charles R. Schram

Q-66. Please refer to the Companies' Response to JI 1-32(b). Please provide any preliminary pricing and terms received by the Companies from these potential gas suppliers.

A-66. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

The entire attachment is confidential and provided separately under seal.

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Question No. 67

Responding Witness: Stuart A. Wilson

Q-67. Please refer to SAW-1, Tables 20 and 21.

a. Expressed in the same terms as given in these tables, what is the Companies' minimum LOLE standard?

b. Please provide the workbook(s) with all formulas and links intact and changing nothing, that were used to create these tables.

A-67.

a. The Companies do not have a minimum LOLE standard. For the summer and winter, the minimum of their target reserve margin range is the "economic" reserve margin (see Figure 4 and associated discussion at page D-8 in Exhibit SAW-1, Appendix D).

b. See "\Reliability\SERVM\Inputs\20221209_CostBenefits.xlsx" in Exhibit SAW-2.

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Question No. 68

Responding Witness: Stuart A. Wilson

Q-68. Please provide the documents with all formulas and links intact and changing nothing, that serve as the basis for the Mercer County solar project cost contained in "CONFIDENTIAL_20221209_ResourceAssessmentTables_0308".

A-68. The only cost listed for the Mercer County solar project in the referenced Excel file is the "Purchase Price $/kW" in Cell L114 of the worksheet labeled "RFPResponses." This value represents the total capital cost for the project divided by its capacity, as calculated in Cell AM134 of the worksheet labeled "Resources" in 01_Screening/CONFIDENTIAL_20221209_ResourceScreeningModel_0308.xlsx.

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Question No. 69

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

Q-69. Please provide the workbooks with all formulas and links intact showing how the HDR study given as Attachment to JI-1.9(e) was translated into the values given in cells Z23 and Z24 of "CONFIDENTIAL_20221209_FinancialModel_0308_Ph1_D01".

A-69. See the response to PSC 2-75(a). Attachments 3 and 4 provide a detailed breakdown of the costs referenced in the Financial Model.

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Question No. 70

Responding Witness: Lonnie E. Bellar

Q-70. Please refer to the Attachment to JI-1.9(e).

a. In what year's dollars are the project cost estimates given?

b. The study states, "[redacted]." What contracting approach is intended in this statement?

c. Please provide the workbook(s) with all formulas and links intact used to create the NGCC project cost estimates.

d. If the workbooks requested in subpart (c) do not show when the date and source of information upon which the various components of the cost estimate were collected, e.g., turbine, commodities, labor, etc. please provide that information as well.

e. What is the basis for the statement in response to JI 1.11(a) that the estimate is at an AACE Class 3?

f. Do the Companies intend to complete a front end engineering and design study before beginning construction of these facilities? If so, when?

A-70.

a. Cost estimates are in 2022 dollars.

b. The contracting approach for the NGCC projects is an Original Equipment Manufacturer ("OEM") lead EPC Agreement.

c. See the response to Question No. 69.

d. See the response to part (c).

e. The Owners Engineer stated the estimates were at an AACE Class 3.

f. No, the Company completed a front-end engineering and design study in 2022. A second engineering and design front end study is not required before beginning construction.

KENTUCKY UTILITIES COMPANY
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LOUISVILLE GAS AND ELECTRIC COMPANY

Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
Dated April 14, 2023

Case No. 2022-00402

Question No. 71

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-71. Please refer to the response to JI-1.9(a). Please assume that the Companies' petition is approved by the Commission.

a. What approval, if any, will the Companies seek from the Commission over the signed EPC agreement?

b. What approval, if any, will the Companies seek from the Commission over the Long-Term Service Agreement (LTSA)?

c. Do the Companies intend to enter into a turbine purchase agreement (TPA)?

d. If the answer to subpart c is yes, who will be responsible for potential delays in commercial operation date due to start up and commissioning?

e. Are the Companies aware of any other NGCC project currently under development or construction using the approach of separate solicitations and contracts for the EPC and OEM? If so, which projects?

A-71.

a. Commission approval of the signed EPC agreement is not required upon approval of the CPCN.

b. Commission approval of the signed LTSA agreement is not required upon approval of the CPCN.

c. No, as indicated in response to Question No.70(b) the Companies will award an EPC agreement to the OEM supplier.

d. Not applicable.

e. Yes, as this has been a historically common way to procure this type of equipment. However, this is not the procurement method we have chosen as recent movement in the industry is shifting toward our chosen method of having the Original Equipment Manufacturer (OEM) lead the effort.

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Question No. 72

Responding Witness: Tim A. Jones

Q-72. Please provide the annual sum of cumulative MW of distributed solar contained in the load forecast produced by Mr. Jones.

A-72.

End of Year	Cumulative Distributed Solar Forecast (MW)[12]
2023	46
2024	58
2025	71
2026	90
2027	96
2028	102
2029	108
2030	114
2031	120
2032	125
2033	131
2034	137
2035	142
2036	146
2037	150
2038	155
2039	159
2040	164
2041	168
2042	173
2043	177
2044	181
2045	186
2046	190
2047	195
2048	199
2049	204
2050	208
2051	212
2052	217

[12] Includes ODP and both Net Metering and Qualifying Facilities customers.

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Question No. 73

Responding Witness: Tim A. Jones

Q-73. If the Companies have re-estimated the High Case for distributed solar given in Figure 5-13 of the 2021 IRP, please provide that forecast in spreadsheet format.

A-73. The Companies have not re-estimated the High Case Forecast for distributed solar.

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Question No. 74

Responding Witness: Stuart A. Wilson

Q-74. Please refer to the PLEXOS input file named "RenewableProfiles_22RFP".

a. Please confirm that the profiles were developed by the Companies. If not confirmed, please explain.

b. If the profiles were developed by the Companies, please explain how each of the solar and wind profiles were developed.

A-74.

a. Initial profiles were developed by the Companies for all resources passing initial screening. The Companies sent selected solar responders hourly weather data and requested that they create generation profiles.

b. For each RFP respondent, modeled historical weather data was queried from the NREL National Solar Radiation Database (NSRDB) for the GPS coordinates provided for each project. Using the properties specified by RFP respondents, solar profiles were developed using the "pvlib python" software and wind profiles were generated in the "R" software. As mentioned in part A, the Companies subsequently selected "finalist" respondents and requested that they create generation profiles based on the NSRDB weather data specific to their project location. Throughout this process, the historical weather data used to create generation profiles aligns with the load profile used in the PLEXOS software.

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Question No. 75

Responding Witness: Stuart A. Wilson

Q-75. Please refer to the PLEXOS input file named "StorageEfficiency_22RFP". Please explain how the Companies developed the values provided in this file.

A-75. PLEXOS uses the referenced file for properties called "Charge Efficiency" and "Discharge Efficiency", which calculate energy losses incurred when energy is moved into and out of a battery. The "round-trip efficiency" is the percentage of energy remaining after accounting for both charging *and* discharging losses and is the number that was provided by RFP respondents for each storage project. The value provided in the "StorageEfficiency_22RFP", when squared, is equal to the "round-trip efficiency" provided for each battery storage project.

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Question No. 76

Responding Witness: Stuart A. Wilson

Q-76. Please refer to the workbook "CONFIDENTIAL_2021209_ResourceAssessmentTables_0308", worksheet named "RFPResponses".

a. Please confirm if the costs reported in columns L, M, and N are reported in 2021 dollars.

b. Please provide the round-trip efficiency for each of the four hour standalone battery storage projects.

A-76.

a. The costs in columns L, M, and N reflect costs as of the start date of each proposal as shown in column J.

b. Round-trip efficiency for all battery storage proposals is shown in column Q of the worksheet labeled "Resources" in 01_Screening/CONFIDENTIAL_20221209_ResourceScreeningModel_0308.xlsx.

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Question No. 77

Responding Witness: Stuart A. Wilson

Q-77. Please refer to the SERVM Study named "Case30_Case21PlusDSMBatt" and resource named "SolarAsset.265".

a. Please confirm that this resource represents the Mercer County and Marion County solar projects.

b. If not, please explain what this resource represents.

A-77.

a. Confirmed. Note that "SolarAsset.265" has 265 MW while the sum of the current Mercer and Marion county projects is 240 MW. The final value of 240 MW was not available until late in the supply-side analysis process, and the Companies' SERVM modeling did not reflect this change. (The Companies' other modeling did reflect this change.) The updated version of Exhibit SAW-1 provided for the response to JI 2-60(a) has 240 MW for the owned solar assets. This impact of this change on the SERVM modeling is immaterial.

b. See the response to part (a).

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Question No. 78

Responding Witness: Stuart A. Wilson

Q-78. Please refer to Exhibit SAW-1 on page 37.

a. Please explain if the DSM modeled in SERVM incorporated energy efficiency impacts.

b. Please explain how energy efficiency was modeled in SERVM.

A-78.

a. Only dispatchable DSM programs were modeled as resources in SERVM. The impacts of non-dispatchable DSM programs and customer-initiated energy efficiency improvements were reflected in the "weather year" load forecasts, which are inputs in SERVM.

b. See the response to part (a).

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Question No. 79

Responding Witness: Lonnie E. Bellar

Q-79. Please refer to page two of the file named "06-JI_DR1_LGE_KU_Attach_to_Q_1(c)_-_Att_4_Gas_Conversion_Technical_Summary".

a. Please provide the page number reference from the "B&V Study" for the "Total Capital Cost of Unit Conversion" reported for Mill Creek 1&2 and Brown 3.

b. Please provide the EN Engineering "Natural Gas Transmission Pipeline Cost Estimate, E.W. Brown Station 30'' Proposed Pipeline" referenced on page 7.

c. Please provide the EN Engineering "Mill Creek Generating Station Pipeline Feed Study" referenced on page 7.

A-79.

a. For the relevant costs to EW Brown 3, the capital costs are presented as part of Table 5-1 of the previously submitted B&V Study. Table 5-1 is located in pages 5-4 through 5-6 (numbered pages 77-79). It is also presented in Appendix E, pages E-2 through E-4 (numbered pages 186-188). The total costs presented are for EW Brown Units 1, 2, and 3. The Unit 3 cost specified is portioned out of the respective total.

There is no corresponding study for Mill Creek 1 and 2. The capital costs are projected using the aforementioned EW Brown Unit 3 costs as a baseline, and estimated from that baseline using information from a previously referenced B&V study on NOx reduction.

b. See attached.

c. See attached.

The attachments are being provided in separate files.

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Question No. 80

Responding Witness: Stuart A. Wilson

Q-80. Please refer to the workbook named "PSC DR 1 LGE-KU Attach to Q47(a) - Att 4 2023-03 UPDATE CONFIDENTIAL_FinancialModel".

a. Please explain why the "XM System Upgrades" are reported as a [redacted] in Column O of the worksheet named "Detail" for the Mill Creek CC but are reported as a [redacted] for the Brown CC.

b. Please confirm that the costs of the 637 MW of PPA solar resources are included in the "ProdCosts" row of worksheet "Model".

i. If the costs are not included in the "ProdCosts" row please provide a reference for the costs in the worksheet "Model".

A-80.

a. See the response to PSC 1-53(a-b).

b. Confirmed.

i. Not applicable.

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Question No. 81

Responding Witness: Christopher M. Garrett / Stuart A. Wilson

Q-81. Please refer to the Companies response to PSC Question 47 subpart (a) where the Companies state "Regarding the PTC, the Companies determined that the PTC for the owned solar projects should be grossed up for taxes to fully reflect its impact on revenue requirements."

a. Please confirm if the Companies applied a gross up for taxes to the 637 MW of solar PPAs.

i. If the Companies did apply a gross up for taxes, please provide the supporting workbook, with all formulas and links intact showing the gross up for taxes.

ii. If the Companies did not apply a gross up for taxes for the 637 MW of solar PPAs, please explain why not.

b. Please refer to the table showing the "Brown BESS ITC ($ millions)". Please explain the basis for the "ITC 50% Tax Basis Reduction" that is included in the "Net Tax Benefit".

A-81.

a. A gross up for taxes is not applicable for the solar PPAs and was not applied. For the PPAs, the Companies will pay the project owners a fixed price for energy produced and the project owners will receive any tax benefits.

i. Not applicable.

ii. See the response to part (a).

b. Per IRC Section 50(c)(3)(A), in the case of energy investment tax credits under IRC Section 48, the depreciable tax basis of the property which gave rise to the credit must be reduced by 50 percent of the credit amount. The "ITC 50% Tax Basis Reduction" on the table provided in response to PSC 1-47 part (a) represents the tax impact of that basis reduction.

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Question No. 82

Responding Witness: Tim A. Jones / Stuart A. Wilson

Q-82. In LGE-KU's 2021 IRP filing (Volume I, p.5-29), the companies address "Distributed Generation Forecast Scenarios." Figure 5-13 shows a High scenario in which distributed generation solar capacity grows to exceed 500 MW by 2030. In the discussion, it states, "In the high scenario, a new federal law is assumed to eliminate the 1% cap on total installed net metering capacity. As a result, the high scenario is identical to the base scenario through 2027 and then continues to grow thereafter. The steep increase in capacity seen from 2028-2030 in the high scenario is due to quickly falling capital costs coupled with the ITC. After 2030, the capacity costs for installing solar decline much less rapidly, resulting in slower capacity growth as compared to the previous few years. Capacity growth flattens out further after 2034 due to the assumed end of the 10-year ITC."

a. Please provide the workpapers and supporting documentation used in the development of the above-referenced distributed generation growth scenario.

b. Please refer to the Companies Response to PSC 1.90.c, including a "comparison of the annual distributed generation capacity forecasts from the 2021 IRP and the current CPCN filing," and referring to Exh. TAJ-3 at: Hourly_Forecast_Updates\PV\PV_newHourly.xlsx.

i. Regarding Exh. TAJ-3 at: Hourly_Forecast_Updates\PV\PV_newHourly.xlsx, please explain all column headings, and provide all assumptions and formulas used.

ii. Please produce additional workpapers or supporting documentation used in the development of the annual distributed generation capacity forecast in the current CPCN filing, if any.

A-82.

a. For any confidential workpapers relating to the high case solar scenario, see

the response to Question No. 63. The public workpapers the Companies provided in response to JI 1-3 in that proceeding are available at https://highq.in/ous6sqhwi9.

b.

i. See attached. All column headings in this file are explained in the attachment. All formulas used to calculate column variables in "PV_newHourly" are intact, except when originally calculated in another file and pasted in. If calculated in another file, then that file is referenced in the table in the attachment and can be found in Exhibit TAJ-3. Assumptions made for the CPCN distributed generation capacity forecast are discussed in Exhibit TAJ-1, p. 22-34, 3.6 Distributed Energy Resources.

ii. There were no additional workpapers created for the development of the annual distributed generation capacity forecast in the current CPCN filing.

The attachment is being provided in a separate file.

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Question No. 83

Responding Witness: Tim A. Jones

Q-83. In Commission Staff DR 1.90, the Companies provide a projection of DER growth, assuming that after DER's reach 1% of annual peak load, exported energy will be compensated at the SQF rate. Please provide an alternate scenario projecting DER growth, assuming energy exports will continue to be compensated at the NMS-2 rate beyond the 1% threshold. Please provide all underlying calculations and workpapers.

A-83. See attachment being provided in Excel format. Regarding underlying calculations and workpapers, see Exhibit TAJ-3. The customer growth model upon which this capacity forecast is based is the same as near-term model described in the Jones Testimony at p. 23, lines 5-8. However, instead of changing the customer growth rate when the 1% cap is hit, this alternate NMS-2 scenario continues to grow at what was the near-term rate for the duration of the forecast period. Installed capacity per customer assumptions in this scenario only change once as well, changing from 9 kW per customer to 7 kW per customer after the ITC ends in 2035.

The attachment is being provided in a separate file.

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Question No. 84

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

Q-84. Please refer to PPL's 2021 Climate Assessment Report, "Energy Forward," at 4, including the statement: "We view our path to net-zero emissions on a continuum, with a primary focus on eliminating our gross emissions, leveraging technology to remove emissions where they cannot be eliminated due to cost or reliability constraints, and finally, considering carbon offsets for any remaining emissions as the least-preferred options."

a. Have the Companies done any price discovery related to existing carbon offset markets? If so, please explain the scope of such efforts, including methods, sources, and purpose of analysis. Please provide supporting documentation, if applicable.

b. In the Companies' estimation, how will the price and availability of carbon offsets change over each of: (i) the next 10 years; (ii) the next 20 years; (iii) the next 30 years; and (iv) the next 40 years?

A-84.

a. As the statements says, "carbon offsets for any remaining emissions as the least preferred option" means that the issue of offset will not need to be addressed until closer to 2050. Therefore, it is not possible to know today whether or not offsets will be needed, and if so, what the market for such offsets will be in 2050. Hence, while the Companies are generally aware that carbon offset markets exist today, the Companies have not explored them to meet a potential 2050 need.

b. See the response to part (a).

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Question No. 85

Responding Witness: Lana Isaacson / Tim A. Jones

Q-85. Please refer to the Companies' Response to Joint Intervenors' Initial Request 1.92(e), which includes the following statements:

"The load forecast reflects the impacts of non-dispatchable DSM-EE programs. Preliminary non-dispatchable programs and kWh savings estimates were provided in early October 2022. Final programs and savings estimates were provided in November 2022."; and "The information provided was projections of energy reductions associated with each applicable DSM-EE program."

a. Please produce the information provided in early October 2022, including identification of each specific non-dispatchable program and associated program-level savings estimates.

b. Please produce the information provided in November 2022, including identification of each specific non-dispatchable program and associated program-level savings estimates.

A-85.

a. See the attachment being provided in Excel format.

b. See Exhibit TAJ-3 (confidential workpapers) at Hourly_Forecast_Updates\DSM\DSM Savings Summary_Cadmus_Final_D02.xlsx.

The attachment is being provided in a separate file.

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Question No. 86

Responding Witness: Stuart A. Wilson

Q-86. Please describe how the Companies evaluated the potential for expanded energy efficiency programs in their Resource Assessment.

A-86. The Companies did not evaluate the potential for expanded energy efficiency programs in their Resource Assessment. The Companies considered the potential for expanded energy efficiency programs in developing their DSM-EE Program Plan.

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Question No. 87

Responding Witness: Lana Isaacson / Stuart A. Wilson

Q-87. Please describe whether and how each of the following avoided costs related to energy efficiency were factored into each of the resource assessment, the initial screening of DSM/EE programs, and/or the cost effectiveness testing of DSM/EE programs. For each of these not factored into analyses, explain why not. Please identify and quote any parts of Kentucky statutes used in responding.

a. Avoided risks related to future carbon related costs;

b. Avoided environmental compliance costs; and

c. Avoided costs due to fewer arrearages; collections costs; bill payment problems.

A-87.

a. Regarding the Companies' consideration of possible future carbon-related costs in the Resource Assessment, see, e.g., Exhibit SAW-1, Section 4.5.2.

The Companies did not address avoided risks related to future carbon-related cost in their initial screening of DSM-EE programs or their DSM-EE cost-effectiveness testing. It was unnecessary to do so because such programs, unlike adding environmental controls or new generating units, are not multi-decade capital commitments and typically do not require three to five years to develop and deploy. Therefore, it was not necessary to account for hypothetical future carbon costs in the cost-benefit analyses for the Companies' currently proposed DSM-EE programs; if such costs eventuate or become reasonably certain, the Companies can incorporate them into future DSM-EE cost-benefit analyses, including a possible mid-program-plan filing to update or expand programs.

b. Regarding the Resource Assessment, the Companies evaluated whether to retire or replace one or more of Mill Creek 2, Ghent 2, and Brown 3 as a means of reducing costs for customers and complying with the Good Neighbor Plan. In addition, the Companies' decision to retire Mill Creek 1 by 2025 resulted from the economics of retirement versus incurring the cost to comply with the Effluent Limitation Guidelines; had the Companies not already made that decision, Good Neighbor Plan compliance costs would have compelled it. Moreover, energy costs for the Companies' units include variable environmental compliance costs (e.g., consumables), which factored into the Companies' resource and dispatch modeling.

The Companies did not *explicitly* factor avoided environmental costs into their initial screening or cost-benefit analysis of DSM-EE programs, but they did *implicitly* include them. The marginal energy costs used to develop avoided energy costs for DSM-EE screening and cost effectiveness testing included variable O&M associated with environmental compliance facilities for units providing marginal energy in each hour. In addition, avoided environmental compliance costs factored into the Companies' DSM-EE cost-effectiveness testing by assuming a 2028 capacity need in the calculation of avoided capacity costs. The timing of this need is based on the assumed timeline for complying with the Good Neighbor Plan.

c. Note that changes to uncollectible amounts do not affect revenue requirements. Collection and arrearages costs do affect revenue requirements, but they are a very small fraction of total revenue requirements; any plausible change in such costs eventually reflected in rates would not affect customers' consumption sufficiently to materially change the load forecast due to the low price elasticity of demand.[13]

The Resource Assessment did not address billing, arrearage, or collection costs because they do not materially affect the load forecast or the economics of the lowest reasonable cost supply-side portfolio. Developing the lowest reasonable cost portfolio should, all other things being equal, help minimize arrearages, collections costs, and bill payment problems by minimizing long-term revenue requirements.

The Companies did not factor avoided billing, arrearage, or collection costs into their initial screening or cost-benefit analysis of DSM-EE programs. The Companies do not possess data for their own service territories showing a correlation between deploying DSM-EE programs of any kind and the magnitude of the cited issues.

[13] *See, e.g.,* Exhibit TAJ-1 at 40 (showing the Companies' price elasticity of demand to be between -0.1 and -0.15).

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Question No. 88

Responding Witness: Lana Isaacson / Stuart A. Wilson

Q-88. The Companies frequently mention the lower levels of carbon dioxide emissions that will come from the gas plants in comparison to existing coal plants.

a. Please describe whether and how avoided greenhouse gas emissions from energy efficiency program savings were factored into each of the resource assessment, the initial screening of DSM/EE programs, the cost effectiveness testing of DSM/EE programs or any other analyses of energy efficiency programs.

b. Please explain how avoided carbon dioxide emissions from energy efficiency program savings were included in your analyses, if at all?

A-88.

a. See the response to Question No. 87(a).

b. The impact of non-dispatchable energy efficiency programs and customer-initiated energy efficiency improvements is reflected in the CPCN load forecast, which results in carbon dioxide emissions that are lower than they otherwise would be.

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Question No. 89

Responding Witness: John Bevington

Q-89. Please refer to the Companies' response to JI 1.105.c and 1.105.d, and answer the following requests.

a. If the measures currently offered through the WeCare Program do not differ at all from the ten measures listed at page 28 of Ex. JB-1 (response to JI 1.105.c), please explain why, in response to JI 1.105.d, Mr. Bevington states that there are approximately 100 measures that qualify for installation through the program.

b. Do the Companies record the particular measures installed in each customer home served through the WeCare program?

i. If so, please provide, for each one of the eligible measures in the WeCare program, the percentage of WeCare applicants that received that measure in each of the last three years.

ii. If so, please also identify the percentage of WeCare applicants that received only educational measures in each of the last three years.

iii. If not, please explain why not.

A-89.

a. The reference to approximately 100 measures includes each of the different LED bulb types and wattages, the different levels of insulation (thickness or R-level), the types and quantities of air sealing / caulking, and the different lengths and areas of weatherstripping that may be installed.

b. Yes.

i. See attached.

ii. Zero. During the initial visit, which includes the educational portion of the program, all customers receive measure(s) other than educational measures. Most often, the auditor installs light bulbs or sink aerators.

iii. Not applicable.

The attachment is being provided in a separate file.

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Question No. 90

Responding Witness: Stuart A. Wilson

Q-90. Please refer to PSC DR1.87a, which begins, "*Refer to the executive summary of Exhibit SAW-1 (Reserve Margin Analysis), which states, "The cost of capacity for this analysis was based on a response to the Companies' June 2022 RFP for simple-cycle combustion turbine ("SCCT") capacity…"*; and the Companies state in response: "The updated SCCT capacity cost is based on an RFP response from LG&E/KU's Project Engineering group. See Proposal No. 108 in Table 42 in Exhibit SAW-1, Appendix B."

a. Please confirm that, in the context of the above-referenced question, "capacity price" and "cost of capacity" have the same meaning? If not confirmed, please explain the distinction between the two phrases.

b. Please identify the cost of capacity used in the SAW-1 analysis and demonstrate how that figure was arrived at based on the SCCT proposal number 108, including production of underlying workpapers or calculations.

A-90.

a. Confirmed. The "Purchase Price" shown in $/kW in Table 42 in Exhibit SAW-1 is the "cost of capacity" and "capacity cost" referenced in PSC 1-87 and the Companies' response to the question.

b. The "Purchase Price" shown in $/kW in Table 42 in Exhibit SAW-1 represents the total capital cost for the project divided by its capacity, as calculated in Cell AM121 of the worksheet labeled "Resources" in 01_Screening/CONFIDENTIAL_20221209_ResourceScreeningModel_0308.xlsx.

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Question No. 91

Responding Witness: Stuart A. Wilson

Q-91. Please refer to the Companies' response to PSC DR 1.87b, and answer the following requests.

a. The response to PSC DR1.87b explains why the SCCT cost of capacity in the SAW-1 analysis was 34% lower than in the 2021 IRP analysis, and states, "Capital, fixed O&M, and firm gas transport costs are 23%, 85%, and 30% lower, respectively." Please explain in detail the reasons for these substantial price declines.

b. Has there been a dramatic change in SCCT technology between the 2021 IRP and the SAW-1 analysis that would explain an 85% decline in fixed O&M costs?

A-91.

a. Capital and fixed O&M for the referenced SCCT cost of capacity in the 2021 IRP analysis were derived from generic greenfield SCCT costs in NREL's 2021 ATB, whereas the capital and fixed O&M in the SAW-1 analysis were based on site-specific and resource-specific responses to the Companies' RFP. The Companies do not know why the 2021 ATB costs differ from the current market, but some of the cost difference could be explained by economies of scale, as both construction and operation of SCCTs is less expensive when multiple units are built at the same site.

Firm gas transport costs in the 2021 IRP analysis were derived from the Companies' firm gas transport contract for the Trimble SCCTs, whereas the firm gas transport costs in the SAW-1 analysis were based on preliminary negotiations with pipeline operators for new service. The cost of new service varies depending upon the pipeline operator, the characteristics of service that are available, and the needs of the unit(s) being served.

b. See the response to part (a). The Companies are unaware of any dramatic change in SCCT technology that would explain the 85% decline in fixed O&M costs. The fixed O&M costs used in Exhibit SAW-1 reflect a specific proposal and are consistent with the fixed O&M costs associated with the Companies' existing SCCTs.

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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
Dated April 14, 2023

Case No. 2022-00402

Question No. 92

Responding Witness: Lonnie E. Bellar / Christopher M. Garrett

Q-92. On April 4, 2023, the IRS released regulation IR-2023-69 that describes certain rules that the IRS intends to include in forthcoming proposed regulations for determining what constitutes an energy community for the production and investment tax credits. Have the Companies reviewed this new guidance to evaluate whether any of their solar or storage proposals would qualify for the 10% bonus tax credit for energy communities? If so, please describe the Companies' review process and report the Companies' current view of each project's potential eligibility for the referenced bonus tax credit.

A-92. The Company is currently reviewing Notice 2023-29 as released per IR-2023-69. In general, the Notice describes certain rules that the Treasury Department and the IRS intend to include in forthcoming proposed regulations for determining what qualifies for the energy community 10% bonus tax credit.

Energy communities are defined as:

1. A "brownfield site" (as defined in certain subparagraphs of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA))
2. A "metropolitan statistical area" or "non-metropolitan statistical area" that has (or had at any time after 2009)
    - 0.17% or greater direct employment or 25% or greater local tax revenues related to the extraction, processing, transport, or storage of coal, oil, or natural gas; and
    - has an unemployment rate at or above the national average unemployment rate for the previous year.
3. A census tract (or directly adjoining census tract)
    - in which a coal mine has closed after 1999; or
    - in which a coal-fired electric generating unit has been retired after 2009.

Additionally, the U.S. Department of Energy has released an interactive mapping tool[14] that reflects currently available data on two types of potentially qualifying energy communities; 1) Coal Closure Energy Communities and 2) Areas that meet the Fossil Fuel Employment 0.17% Threshold. Below are the Company's current view of each project's potential eligibility for the bonus tax credit based on the interactive map and guidance provided in Notice 2023-29.

Mercer County Brown BESS – The Company believes that this facility will qualify for the 10% bonus tax credit and has included it in its analysis. The proposed location of the facility lies within a qualifying Coal Closure Energy Community as defined by Notice 2023-29 and identified by the Department of Energy's interactive map.

Mercer County Solar Facility – The Company currently assumes that this facility will not qualify for the 10% bonus tax credit. The proposed location of the facility currently falls outside of a qualifying area for Coal Closure Energy Communities. The proposed location of the facility is located within the Fossil Fuel Employment 0.17% Threshold area and could potentially qualify for the 10% bonus tax credit if the county's unemployment rate for the previous year is equal to or greater than the national average unemployment rate. The IRS expects to release unemployment data each year in May. The interactive map will be updated at that time and the Company will review for potential eligibility. Also note that unemployment data will be updated each year, and therefore, areas previously qualifying may no longer qualify in the future.

Marion County Solar Facility – The Company currently assumes that this facility will not qualify for the 10% bonus tax credit. Marion County does not have any qualifying areas for Coal Closure Energy Communities. The proposed location of the facility is within the Fossil Fuel Employment 0.17% Threshold area and could potentially qualify for the 10% bonus tax credit if the county's unemployment rate for the previous year is equal to or greater than the national average unemployment rate. Similar to the Mercer County Solar Facility, the Company will wait for further unemployment data to be released to determine eligibility for the 10% bonus tax credit.

[14] Link to Interactive Map - https://energycommunities.gov/energy-community-tax-credit-bonus/

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Question No. 93

Responding Witness: Lonnie E. Bellar

Q-93. Is respect to the proposed Mercer County solar site, please answer the following requests:

a. Is the proposed Mercer County solar site adjacent to or contiguous with the Companies' existing EW Brown facility or other Company-owned facility?

b. If the answer to subpart (a) above is, no, please state the distance separating the proposed Mercer County solar site and the EW Brown facility.

c. Do the Companies presently own all the land planned for the Mercer County Solar project? If not, what is the status of land acquisition effort, including future milestones and timeline to completion.

A-93.

a. No, the proposed Mercer County solar site is approximately 13 miles from the existing EW Brown facility.

b. See the response to part (a).

c. See the response to PSC 2-58(b).

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Question No. 94

Responding Witness: Lonnie E. Bellar

Q-94. Please refer to page 13 of Ex. SAW-1, particularly the following statement:

"The Companies' Muhlenberg Self-Build Solar Proposal Relocated to Mercer County. One RFP response proposed to sell the Companies a solar project already in advanced stages of development, but not construction, located in Mercer County. Because the proposal was not for a commercially executable transaction for a PPA or to acquire a solar facility per se, the Companies' Project Engineering group reviewed it and determined it would be a more suitable self-build solar site than their originally proposed site in Muhlenberg County, which had become problematic due to land acquisition issues. The Companies' Project Engineering group therefore revised their self-build proposal to suit the proposal at the Mercer County site, resulting in a 120 MW self-build solar proposal in Mercer County rather than a 145 MW self-build solar proposal in Muhlenberg County."

a. Please describe the specific land acquisition issues for the Muhlenberg County site.

b. Where there other issues, apart from land acquisition, that also created barriers to the Muhlenberg County site, or made it a less suitable self-build solar site? Please explain.

c. Do the Companies own property or generation assets in Muhlenberg County? If yes, please identify each such project. For each project identified, please also state that project's proximity to the Muhlenberg County site discussed above.

A-94.

a. The Companies provided a good faith verbal offer to purchase the land in Muhlenberg County. The Companies followed up on the good faith offer and

received no feedback from the land owners. During the due diligence review of the Muhlenberg County property, the Companies researched determined the ownership arrangement involved multiple parties and there was a multi-million-dollar mortgage on the property. When the Companies provided the good faith offer, the property's point of contact indicated the land is critical to their farming and livestock operations.

b. There were no other major issues apart from land acquisition associated with the Muhlenberg County site.

c. Yes, the Companies own the former Green River generating station in Muhlenberg County. The Muhlenberg County site was adjacent to the former Green River generating station.

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Question No. 95

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

Q-95. In response to PSC DR1 Q.53(b), the Companies provided a spreadsheet comparing pricing of battery storage proposals and the Brown BESS 125 MW project the Companies propose to build.

a. Have the Companies calculated a capacity price ($/KW-Month) for the Brown BESS? If so, please provide the capacity price ($/KW-Month) and explain why it was not included in the referenced spreadsheet.

b. Please explain how the Levelized Cost of Capacity ($/MW-Year) is calculated.

c. Please explain why the Brown BESS was selected above other battery storage projects submitted in response to the RFP.

d. For each lower-cost battery proposal, please identify any and all factors that led to its rejection.

e. What are the execution risks for BESS proposals and how do they compare to solar PPA execution risks?

A-95.

a. No.

b. Levelized Cost of Capacity represents annual capacity payments (equal to the monthly capacity price in $/kW-month, escalating as appropriate per the proposal * capacity in MW *12 months) levelized over the term of the proposal.

c. See the response to PSC 1-53(d).

d. See the responses to PSC 1-53(b) and (d) and Exhibit SAW-1 Sections 4.4.1 and 4.6.2.

e. See the response to PSC 1-53(d). For the Companies, the primary risks that differentiate a BESS PPA from a solar PPA do not relate to execution; rather, they are operating and negotiating risks. Batteries are a complicated technology with a variety of grid uses and unique long-term operation and maintenance characteristics; by comparison, solar generation is simple. Part of what has enabled the Companies to successfully negotiate six solar PPAs is the experience the Companies have gained from operating the Brown Solar facility for seven years. Today, the Companies have no operational experience at scale with BESS technology, putting them at a significant disadvantage in negotiating a BESS PPA with a 15-year commitment wherein the Companies' operational rights and remedies for seller's failure to perform would be governed by the terms of the PPA. That is one reason why owning and operating the Brown BESS will be valuable: the Companies will be able to gain operational experience with BESS technology that will both serve customers now and enable the Companies to be in a stronger, more informed position to negotiate potential BESS contracts that could benefit customers in the future.

Also, it is noteworthy that even utilities that have significant amounts of BESS PPA capacity also own BESS facilities, just as utilities often have a blend of owned solar and PPA-contracted solar. For example, Pacific Gas & Electric ("PG&E") has made and is making large investments and commitments regarding BESS, aiming to have over 3,300 MW of BESS capacity available for its customers by 2024.[15] Though much of that is and will be BESS PPA capacity, PG&E has an existing utility-owned 182.5 MW Elkhorn BESS, which went in service in 2022.[16] Therefore, the Companies' proposed Brown BESS would not preclude, but rather could facilitate, future BESS PPAs for the Companies.

[15] PG&E Press Release, "The Next Giant Leap for Electric System Reliability: PG&E Proposes Nearly 1,600 MW of New Battery Energy Storage Capacity" (Jan. 24, 2022) ("If approved by the California Public Utilities Commission (CPUC), these nine projects would bring PG&E's total battery energy storage system capacity to more than 3,330 MW by 2024."), available at https://www.pge.com/en_US/about-pge/media-newsroom/news-details.page?pageID=38883b6b-8597-4734-b85a-104a9f6e8af3&ts=1643133870903 (accessed May 2, 2023).

[16] PG&E, "Creating Our Clean Energy Future: PG&E Commissions its Moss Landing Elkhorn Battery" (Apr. 18, 2022), available at https://investor.pgecorp.com/news-events/press-releases/press-release-details/2022/Creating-Our-Clean-Energy-Future-PGE-Commissions-its-Moss-Landing-Elkhorn-Battery/default.aspx (accessed May 2, 2023).

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Question No. 96

Responding Witness: Philip A. Imber

Q-96. Please refer to the Companies' response to the Attorney General's request No. 1. Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-96. See the response to AG 2-4.

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Question No. 97

Responding Witness: Lonnie E. Bellar / Philip A. Imber

Q-97. Please refer to the Companies' response to the Attorney General's request No. 2. Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-97. See the response to AG 2-4.

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Question No. 98

Responding Witness: Philip A. Imber / Stuart A. Wilson

Q-98. Please refer to the Companies' response to the Sierra Club's request No. 1-25(a). Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-98. The Sierra Club Data Request No. 1-25(a) does not require an update with respect to the final Good Neighbor Plan.

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Question No. 99

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

Q-99. Please refer to the Companies' response to KIUC's request No. 1-2(c). Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-99. See the response to AG 2-4.

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Question No. 100

Responding Witness: Philip A. Imber / Stuart A. Wilson

Q-100. Please refer to the Companies' response to the PSC Staff's request No. 56. Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-100. See the response to AG 2-4.

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Question No. 101

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

Q-101. Please refer to the Companies' response to the Kentucky Coal Associations' request No. 1-15. Please identify and explain in detail any updates that are needed to this response to account for EPA's announcement of its final Good Neighbor Plan on March 15, 2023.

A-101. See the response to AG 2-4.

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Question No. 102

Responding Witness: Lonnie E. Bellar

Q-102. Do the Companies believe that EPA's announcement of its final Good Neighbor Plan on March 15, 2023 included any changes from the proposed version of the Good Neighbor Plan that are material to the Commission's decision in this case? Please explain in detail why or why not.

A-102. No. The changes from the proposed version continue to base a NOx trading program on strict environmental controls, dynamic budgeting, bank recalibration, assurance level penalties, and back stop limits. The final rule offers marginally more emissions allocations in Kentucky's State Budget and the resulting Unit Level allocations; nonetheless, the Companies estimate a shortage of allowances in the timeframe of 2026, 2027, or 2028 that supports the retirement or idling of non-SCR units and the resulting need for lower-emitting replacement generation as posed in the CPCN filing. See the response to AG 2-4.

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Question No. 103

Responding Witness: Lonnie E. Bellar / Philip A. Imber

Q-103. Would EPA's new proposed rule (dated April 3, 2023) that would revise Mercury and Air Toxics Standards for power plants, if finalized as proposed, require the Companies to make any additional capital expenditures to continue operating any of their coal-fired generating units?

a. If yes, please identify which units would require additional capital expenditures and describe the projects that would be required, the anticipated timeframe required to ensure compliance, and any current estimates as to the cost of those projects. If no, please explain in detail why not.

b. To the extent not addressed specifically in response to paragraph (a), please explain in detail whether each of the Companies' coal-fired generating units would require any additional capital expenditures to comply with the proposed revised filterable particulate matter standard of 0.010 lbs/MMBtu. For any units that would require any additional capital expenditures, please describe the projects that would be required, the anticipated timeframe required to ensure compliance, and any current estimates as to the cost of those projects. For any units that would not require any additional capital expenditures, please explain in detail why not.

A-103. Not materially.

a. See the response to Sierra Club 2-14.

b. See the response to Sierra Club 2-14.

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Question No. 104

Responding Witness: Philip A. Imber

Q-104. Please refer to the Companies' response to the Kentucky Coal Association's request No. 1-22.

a. For each of the Effluent Limitations Guidelines projects identified, have the Companies assessed how much additional cost would be required to comply with EPA's proposed supplemental Effluent Limitations Guidelines rule, which was published in the Federal Register on March 29, 2023 (88 Fed. Reg. 18,824)? If yes, please describe in detail what additional projects would be required to comply with the requirements of that proposed rule (if finalized as proposed) and the current cost estimate for those projects. If not, please explain in detail why not.

b. The proposed supplemental rule (if finalized as proposed) would change the technology basis for FGD wastewater requirements and require zero discharge. Please identify what steps the Companies would need to take at Mill Creek, Ghent, E.W. Brown, and Trimble to comply with these proposed rule changes and the estimated minimum amount of time that the Companies would need to complete of those steps.

c. The proposed supplemental rule (if finalized as proposed) would change the technology basis for bottom ash transport water requirements and require zero discharge. Please identify what steps the Companies would need to take at Mill Creek, Ghent, E.W. Brown, and Trimble to comply with these proposed rule changes and the estimated minimum amount of time that the Companies would need to complete of those steps.

d. The proposed supplemental rule (if finalized as proposed) would require additional wastewater treatment for combustion residual leachate prior to discharge. Please identify what steps the Companies would need to take at Mill Creek, Ghent, E.W. Brown, and Trimble to comply with these proposed

rule changes and the estimated minimum amount of time that the Companies would need to complete of those steps.

A-104.

a. No. The Companies are evaluating this newly proposed rule. The Companies have contacted an owners engineer to begin assessing the impacts to the compliance program for existing 2020 ELG rule. The Companies are assessing engineering activities to assess compliance options for the new rule.

b. The compliance timeline for the proposed rule is "as soon as possible but no later than 2029." The Companies need to perform engineering to define and assess compliance strategy options. Given the newness of this rule, the Companies do not have a timeline.

c. See the response to part (b).

d. See the response to part (b).

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Question No. 105

Responding Witness: Robert M. Conroy / David S. Sinclair

Q-105. Please refer to the Companies' response to the Attorney General's request No. 56. Please identify all special contracts for which the Companies have sought Commission approval for service under Option #3, including (1) the date of the request; (2) the date of any Commission decision on the request; (3) any docket number or other identifying number for the special contract; (4) the name of the customer associated with the special contract; (5) the billing load associated with the special contract; and (6) the type of renewable resource associated with the special contract.

A-105. The Companies entered into two Power Purchase Agreements (PPA), see the response to PSC 2-5(c), for use under Green Tariff Option #3, with Rhudes Creek and Ragland (see Question No. 61) that have resulted in Renewable Power Agreements (Special Contracts) with two LG&E customers and five KU customers.

Rhudes Creek PPA:

Electronic Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Approval of a Solar Power Contract and Two Renewable Power Agreements to Satisfy Customer Requests for a Renewable Energy Source Under Green Tariff Option #3.

1) Case filed January 23, 2020
2) Commission Order issued May 8, 2020 and amended on December 16, 2020
3) Case No. 2020-00016
4) KU and Toyota Motor Manufacturing, Kentucky, Inc., ("Toyota"") and KU and Dow Silicones Corporation ("Dow")
5) The solar facility will have a nameplate AC capacity rating of not more than 100 MW. Toyota will receive a 50% share, Dow a 25% share and LG&E/KU a 25% share of energy from the facility.
6) Solar

Ragland PPA:

Special Contracts for Louisville Gas and Electric Company and Kentucky Utilities Company of Five Renewable Power Agreements and Associated Amendments to Satisfy Customer Requests for a Renewable Energy Source Under Green Tariff Option #3:

1) Special Contracts filed with the Tariff Branch on October 13, 2021.
2) Special Contract received effective November 12, 2021
3) TFS2021-00414 and TFS2021-00415 (Tariff Filing System)
4) KU and Dow Silicones Corporation ("Dow"), LG&E and the University of Louisville ("U of L"), KU and the University of Kentucky ("UK"), LG&E and The Chemours Company ("Chemours"), and KU and North American Stainless ("NAS").
5) The solar facility will have a nameplate AC capacity rating of not less than 112.5 and not more than 125 MW. The percent of the renewable energy generated by the solar facility will be distributed as follows: Dow 4%, NAS 36%, U of L 8%, Chemours 8%, and UK 44%.
6) Solar

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Question No. 106

Responding Witness: Philip A. Imber

Q-106. Please refer to Attachments 1 and 2 to the Companies' response to Joint Intervenors' request No. 1-19, which both state (on page 2 of each document) that, "[i]n recognition of U.S. EPA's current environmental justice policies," the Companies "performed certain environmental justice reviews" in connection with preparation of their Title V air construction permit applications.

a. Please identify all environmental justice reviews that the Companies have performed concerning the proposed construction of NGCC plants and supporting infrastructure at Mill Creek and E.W. Brown, including but not limited to any such reviews performed in connection with preparation of the Title V air construction permit applications.

b. Please produce copies of any documents in the Companies' possession reflecting the results of any environmental justice reviews identified in response to paragraph (a) or, to the extent any such documents that have already been produced by the Companies in this case, please identify those documents.

c. Page 2 of each of Attachments 1 and 2 to the response to Joint Intervenors' request No. 1-19 states that each "project has no significant impacts to the environment." Please explain in detail why a project that would potentially burn fossil fuels over a 40-year lifespan (with associated pollutant emissions and other environmental impacts) could be considered to have "no significant impacts to the environment."

d. Page 2 of Attachment 1 to the response to Joint Intervenors' request No. 1-19 states that "[t]he localized air emissions and traffic reductions resulting from the project should theoretically translate to improved health (life expectancy) outcomes." Please identify and explain in detail what is being referred to as the "localized air emissions and traffic reductions resulting from the project."

Please produce copies of any documents supporting this statement or, to the extent any such documents that have already been produced by the Companies in this case, please identify those documents.

e. Page 2 of each of Attachments 1 and 2 to the response to Joint Intervenors' request No. 1-19 states that the Companies used the Climate & Economic Justice Screening Tool as part of its environmental justice reviews. Did the Companies also use U.S. EPA's Environmental Justice Screening and Mapping Tool or U.S. EPA's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool? If yes, please produce any documents reflecting the results of using these tools or, to the extent any such documents that have already been produced by the Companies in this case, please identify those documents. If not, please explain why not.

A-106.

a. The Companies evaluated the *Climate and Environmental Justice Screening Tool* data for the Mill Creek Generating Station and the E.W. Brown Generating Station census tracks.

b. The results for both sites can be found via the following links:

- Climate & Economic Justice Screening Tool (Mill Creek Site) [https://screeningtool.geoplatform.gov/en/#10.66/38.0624/-85.891]

- Climate & Economic Justice Screening Tool (EW Brown Site) [https://screeningtool.geoplatform.gov/en/#9.92/37.7878/-84.7642]

c. The project results in a net reduction of emissions from the retirement of coal-fired electric generating units. This actually results in a net positive impact to the environment.

d. The Companies did not generate additional documents to support these statements. Emissions reduction from the transition to lower emitting electric generating units and emissions reductions from reduced traffic reduce localized emissions. Both the Mill Creek and E.W. Brown sites are in attainment, or being redesignated as attainment, for the National Ambient Air Quality Standards.

e. The Climate and Economic Justice Screening Tool is specifically derived from the U.S. EPA Environmental Justice Screening Tool. So yes, by default, the Companies utilized the U.S. EPA Environmental Justice Screening Tool data in the project evaluations. The Companies did not utilize the U.S. EPA's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool. Prior to this question, the Companies have not had the request to use this tool.

Further, the user manual identifies this tool is useful at the agency and policy maker level and may not be suitable to determine impacts of individual projects.

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Question No. 107

Responding Witness: Lonnie E. Bellar

Q-107. Please refer to Attachments 1 and 2 to the Companies' response to Joint Intervenors' request No. 1-19, which both state (on page 2-6 of each document) that the proposed NGCC Units are "[d]esigned for future hydrogen co-firing." Please confirm whether the Companies are proposing to co-fire hydrogen at either proposed NGCC project, either now or in the future.

A-107. As all gas turbine OEM's offer some level of hydrogen co-firing as part of their standard package, both proposed NGCC projects will have the capability to co-fire hydrogen following commercial acceptance of the operating unit. However, these NGCC projects will not co-fire hydrogen until the Companies identify a commercial source of hydrogen capable of delivering the quantities necessary to sustain co-firing. See also response to KCA 2-51(b).

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Question No. 108

Responding Witness: Lonnie E. Bellar

Q-108. Please refer to the Companies' response to Joint Intervenors' request No. 1-2(b)-(d).

a. Please provide a copy of the Southeast Hydrogen Hub Concept Paper submitted to the U.S. Department of Energy on November 4, 2022.

b. Please confirm whether the Southeast Hydrogen Hub Coalition (or Battelle Memorial Institute as Prime Applicant) have submitted a Phase I application to the U.S. Department of Energy.

c. If yes, please provide a copy of the Phase I application and explain the nature and extent of the Companies' involvement in developing the final proposal and application. If not, please explain why not.

A-108.

a. The Prime Performer and applicant is Battelle Memorial Institute. The Companies are one of a group of participants and do not own the rights to this application, which includes confidential and proprietary technological information covered by a non-disclosure agreement.

b. Confirmed.

c. The Prime Performer and applicant is Battelle Memorial Institute. The Companies are one of a group of participants and do not own the rights to this application, which includes confidential and proprietary technological information covered by a non-disclosure agreement. The Companies were involved in meetings on the development of plans for potential future hydrogen production and delivery nodes, budget estimates, and community benefits plan. If selected for funding by DOE, the Companies will have the option to pursue deploying those funds for projects in Kentucky.

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Question No. 109

Responding Witness: Lonnie E. Bellar

Q-109. Please refer to the Companies' response to Joint Intervenors' request No. 1-2(b)-(d).

a. Please provide a copy of the Southeast Hydrogen Hub Concept Paper submitted to the U.S. Department of Energy on November 4, 2022.

b. Please confirm whether the Southeast Hydrogen Hub Coalition (or Battelle Memorial Institute as Prime Applicant) have submitted a Phase I application to the U.S. Department of Energy.

c. If yes, please provide a copy of the Phase I application and explain the nature and extent of the Companies' involvement in developing the final proposal and application. If not, please explain why not.

A-109. This question is identical to Question No. 108.

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Question No. 110

Responding Witness: Charles R. Schram

Q-110. Please refer to the solar PPA contracts filed in this proceeding on March 1, 2023.

a. Please confirm whether the title on page 1 of the Nacke Pike Solar, LLC PPA (page 5 of the document) that says "Grays Branch Solar, LLC" was written in error. If yes, please provide the correct text. If not, please explain why not.

b. Please confirm whether the definition of "Commission Approvals," found on page 6 of both the Nacke Pike Solar, LLC PPA (page 10 of the document) and the Grays Branch Solar, LLC PPA (page 324 of the document), was written in error where "'Commission Approvals' means such approvals from the PSC or the *Virginia State Corporation Commission*" (emphasis added). If yes, please provide the correct text. If not, please explain why not.

c. Please confirm whether Exhibit E-1 of the Nacke Pike Solar, LLC PPA (page 69 of the document) where the guarantor is identified as an affiliate of "Grays Branch Solar, LLC" was written in error. If yes, please provide the correct text. If not, please explain why not.

A-110.

a. Confirmed, an amendment to the PPA will be executed to correct the typographical error. See attached.

b. The inclusion of Virginia State Corporation Commission in the definition of "Commission Approvals" in the PPAs is not an error. Kentucky Utilities Company does business as Old Dominion Power in Virginia.

c. Confirmed, an amendment to the PPA will be executed to correct the typographical error. The Companies will file the PPA amendment when it is fully executed.

The attachment is being provided in a separate file.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
Dated April 14, 2023

Case No. 2022-00402

Question No. 111

Responding Witness: Charles R. Schram

Q-111. Please refer to the solar PPA contracts filed in this proceeding on March 1, 2023.

a. Please confirm that the GGSO, LLC PPA, found on page 233 of the document, is the same PPA identified in the Direct Testimony of John Crockett, page 7, with BrightNight, LLC and named Gage Solar. If yes, please confirm whether the name of the solar PPA is "Gage Solar" or "GGSO." If not, please explain.

b. Please confirm whether the GGSO, LLC PPA, found at page 233 of the document, is between Companies' and BrightNight, LLC or GGSO, LLC. If BrightNight, LLC, please explain why BrightNight, LLC is not identified in the PPA contract provided.

A-111.

a. Confirmed. BrightNight is the developer of the Gage solar project. GGSO, LLC is the legal entity name for the Gage project.

b. The PPA is between the Companies and GGSO, LLC.

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Case No. 2022-00402

Question No. 112

Responding Witness: Lonnie E. Bellar

Q-112. Please refer to the Companies' response to Joint Intervenors' request No. 1-9(a)-(b). Please identify and explain in detail the basis for the Companies' understanding that approval of a CPCN is required prior to execution of an EPC contract or final selection of the power island technology.

A-112. The execution of an EPC contract and final selection of power island technology will be significant financial commitments for the Companies on behalf of their customers. Prudent regulatory planning requires that, if possible, the Companies should not make those commitments unless and until the Companies have obtained CPNCs allowing them to make those commitments. To do otherwise could expose the Companies and their customers to unnecessary financial risk.

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Case No. 2022-00402

Question No. 113

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

Q-113. Please refer to the Companies' response to Joint Intervenors' request No. 1-20, which in turn refers to the response to Joint Intervenors' request No. 1-9(e).

a. Please explain in detail how the feasibility study produced in response to Joint Intervenors' request No. 1-9(e) "evaluate[s] alternative generation and storage technologies" and "identif[ies] potential new sites for solar generation," as discussed in Mr. Sinclair's testimony.

b. Did the Project Engineering group evaluate other technologies than those discussed in the feasibility study produced in response to Joint Intervenors' request No. 1-9(e)?

i. If yes, please explain in detail what technologies were evaluated and produce any documents in the Companies' possession reflecting that evaluation. If no additional documents exist, please explain in detail why not.

ii. If no, please explain in detail why Mr. Sinclair referenced evaluation of additional technologies in his testimony.

c. Did the Project Engineering group identify potential new sites for solar generation other than those discussed in the feasibility study produced in response to Joint Intervenors' request No. 1-9(e)?

i. If yes, please explain in detail what steps were taken to identify potential new sites and what potential new sites were identified. Please produce any documents in the Companies' possession reflecting that evaluation. If no additional documents exist, please explain in detail why not.

ii. If no, please explain in detail why Mr. Sinclair referenced identification of potential new sites for solar generation in his testimony.

A-113.

a. The feasibility study provided in response to Join Intervenor's request No. 1-9(e) focused solely on the NGCC projects and did not take into consideration alternate generation, storage technologies, and/or solar generation.

b. Yes, the Project Engineering group evaluated and submitted bid responses for solar generation and storage technologies as part of the June 2022 New Generation RFP.

i. See the response and attachment to Mercer County Fiscal Court 2-3.

ii. Not applicable

c. Yes, see the response to Question No. 113.b.

i. See the response to Question No. 113.b.i.
ii. Not applicable.

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Case No. 2022-00402

Question No. 114

Responding Witness: David S. Sinclair

Q-114. Please identify LG&E/KU's reliability coordinator, and provide the minimum reserve capacity requirement established by that reliability coordinator.

a. If the minimum reserve capacity requirement established by the Companies' reliability coordinator is different from the summer and winter "minimum reserve margin target" reflected in Table 5 of Mr. Wilson's direct testimony, please explain the differences.

A-114. The Companies have contracted with the Tennessee Valley Authority ("TVA") to act as the Companies' reliability coordinator since the Companies exited the Midwest (now Midcontinent) Independent System Operator ("MISO"). In that role, TVA does not have the obligation or authority to prescribe a reserve capacity requirement for the Companies.

a. Not applicable.

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Case No. 2022-00402

Question No. 115

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

Q-115. Please refer to the Companies' response to Joint Intervenors' request No. 1-26(b) and accompanying attachment.

a. Please confirm that the attachment is a 232-page contract that was executed on April 14, 2022. If you are unable to confirm, please explain in detail why not.

b. Please identify the first date on which the Companies began discussions with HDR Engineering, Inc. which led to the April 2022 contract that was attached to the response to Joint Intervenors' request No. 1-26(b).

c. Please produce any documents in the Companies' possession that reflect the initial discussions with HDR Engineering, Inc. which led to the April 2022 contract or that otherwise substantiate the date identified in response to paragraph (b) above.

A-115.

a. Confirmed.

b. Companies began discussions with HDR Engineering on March 29, 2022.

c. See attached.

The attachment is being provided in a separate file.

KENTUCKY UTILITIES COMPANY
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Case No. 2022-00402

Question No. 116

Responding Witness: Lonnie E. Bellar / John Bevington

Q-116. Please refer to the Direct Testimony of Tim A. Jones, page 8, and the Companies' response to the PSC Staff's request No. 1-31(d).

a. Please explain in detail the Companies' understanding as to why BlueOval is interested in having a contract for up to 300 MW of solar generation if the facility's current summer peak load is 260 MW and its current winter peak load is 225 MW.

b. Please identify any other of the Companies' large commercial or industrial customers whom the Companies are aware have an interest in contracting for renewable energy. For each customer identified, please identify the potential timing, size, and source of the renewable energy that the customer has expressed an interest in.

A-116.

a. See the response to PSC 2-43.

b. The Companies do not disclose non-public communications and data regarding specific individual customers.

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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information Dated April 14, 2023

Case No. 2022-00402

Question No. 117

Responding Witness: Stuart A. Wilson

Q-117. Please refer to the Companies' response to Joint Intervenors' request No. 1-51. Please confirm that, now that EPA has announced its final version of the Good Neighbor Plan, the Companies continue to believe that this is an appropriate approach to modeling the Plan's constraints in PLEXOS. If you are unable to confirm, please explain in detail why not.

A-117. Confirmed.

KENTUCKY UTILITIES COMPANY
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Response to Metropolitan Housing Coalition, Kentuckians for the Commonwealth, Kentucky Solar Energy Society and Mountain Association's Supplemental Request for Information
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Case No. 2022-00402

Question No. 118

Responding Witness: Lonnie E. Bellar / Philip A. Imber

Q-118. Please refer to the Companies' March 17, 2023 supplemental response to Joint Intervenors' request No. 1-97.

a. Please produce copies of any documents in the Companies' possession reflecting the results of the preliminary subsurface investigation.

b. Please produce copies of all historical records referenced in the response to paragraph (b).

c. Please identify the following concerning the "permitted CCR landfill that was closed before 1993 under and in the vicinity of the proposed Mill Creek NGCC footprint":

i. The name of the CCR unit;

ii. Which permits applied to the CCR unit, which entity issued those permits, and the permit numbers;

iii. The size of the CCR unit;

iv. The depth of the CCR unit;

v. The amount of CCR that is disposed of in the unit;

vi. The method by which the CCR unit was closed; and

vii. Any post-closure care or maintenance, or groundwater monitoring, conducted by the Companies concerning the CCR unit.

d. Please produce copies of any documents in the Companies' possession that were relied on to answer the questions above in paragraph (c).

e. Please identify and describe in detail any steps that the Companies intend to take, or changes that the Companies intend to make to their proposal to construct a NGCC at Mill Creek, to address the discovery of a closed CCR landfill under and in the vicinity of the proposed footprint of the NGCC. If there are none, please explain in detail why not.

A-118.

a. See attached.

b. See attached.

c.

i. The CCR unit is identified as "Site B" in Company drawings and documents.

ii. Site B is included in Landfill Permit Number 056-00029 issued by the Kentucky Division of Waste Management. The initial permit for construction of an Inert Landfill at the Mill Creek Station was issued on February 1, 1982. Subsequent permit transitions changed the landfill's regulatory compliance programs in 1992 (Special Waste under 401 KAR Chapter 45) and 2019 (Coal Combustion Residuals under 401 KAR Chapter 46). Site B has been included in each permit transition and renewal.

iii. In the original IUCS application for the Mill Creek facility (pages 3, 8, 23 & 33), Site B is described as having a plan area of approximately 50 acres.

iv. The original IUCS application describes the average height of fill at Site B as 30 feet (Table III, Page 23). The maximum depth of the materials anticipated for placement at Site B was anticipated to be about 40 feet as shown in the *General Arrangement and Site Grading Plan-Site-B* (Drawing CA-10616). The geotechnical report, cited in item "a.", shows CCR thicknesses that range from 14 to 40 feet, generally verifying the original designs for Site B.

v. The original IUCS application estimates Site B's capacity at 2.2 million cubic yards (pages 23 & 33). Slight modifications to Site B were proposed by the company in 1986 (volume increase for Site B) and 1989

(volume decrease for Site B), but neither resulted in a significant change in capacity from that originally proposed.

Presently available information indicates that Site B was generally completed as described in the original application, so the Companies believe that 2.2 million cubic yards is an accurate estimate of the capacity of Site B.

vi. Site B was closed by placing final cover in accordance with the approved landfill permit plans. Final cover, as described in the IUCS application, consists of a 2-foot thick, compacted soil cap over the stabilized landfill surface (page 29). After the placement of cover soils, the area was vegetated using an appropriate seed mixture, to stabilize cover soils and to minimize erosion.

vii. After placement of the final cover and the establishment of vegetation, the company performed regular mowing of established vegetation and periodic inspection of the cover. Where necessary, eroded areas were filled with soil and reseeded, mulched, and watered to establish vegetation.

After the completion of closure, the Companies used the area for storage of soils and fill materials, construction laydown, and other staging activities. These actions have only added additional fill to the cover, essentially thickening the originally designed/implemented soil cap. Information from the geotechnical investigation indicates soil/fill thicknesses that exceed two feet in some of the investigation locations.

The Companies have conducted semiannual or quarterly groundwater monitoring at the Mill Creek Station every year since initiating the monitoring program in 1981. The groundwater monitoring parameters and locations have changed slightly over the course of the facility's operation, mostly because of regulatory transitions and site-specific considerations.

The facility currently has 36 functional groundwater wells at the site and performs semiannual monitoring in accordance with the provisions of the CCR Rule and 401 KAR Chapter 46. The results of the monitoring are accessible through the Companies' publicly accessible web page.

d. See the responses to parts (a) and (b). In addition, please see attached.

e. Stabilized scrubber sludge ("Poz-O-Tec") that was placed in Site B has many desirable properties for construction, especially in comparison to most natural soil deposits. Because the Poz-O-Tec was placed in thin layers and

compacted, the landfill area is denser and more uniform than what would be encountered in most natural soil deposits. The geotechnical investigation (as noted in the elevated blow counts) indicates the Poz-O-Tec is generally denser than natural soils encountered in the borings. While additional consultation with geotechnical experts is ongoing, the Companies' preliminary opinion is that the CCR landfill area is likely to have less constructability challenges than might be encountered during construction at a "green field" location. The Companies will assure that all planned construction activities address any subgrade vulnerabilities so that completed structures and key infrastructure are resilient and durable. Additionally, the Companies will cooperatively consult with all appropriate regulatory agencies to assure ongoing compliance throughout all phases of the planning, design, and construction processes.

As with all construction sites where uncertainty surrounds the encountered subgrade materials, the Companies will consider a number of foundation options as they apply. For this site, options may include, but are not limited to, raising the base elevation of the NGCC to minimize excavations into the underlying CCR and/or hardscaping the NGCC areas overtop of the closed CCR landfill.

In cases where construction may require the removal of CCR material, the "spoil" will be placed in Mill Creek's active CCR landfill. In such cases, additional CCR may be excavated to assure that two feet of soil cover or other equivalent capping material may be incorporated into the final design.

The attachments are being provided in separate files.