COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2021 JOINT INTEGRATED RESOURCE PLAN OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY	**)** **)** **)** **)**	**CASE NO. 2021-00393**

RESPONSE OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY TO THE COMMISSION STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED JULY 18, 2022

FILED: AUGUST 8, 2022

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, 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 2nd day of August 2022.

Notary Public

Notary Public ID No. KYNP32193

My Commission Expires:

June 25, 2025

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's Post-Hearing Request for Information
Dated July 18, 2022

Case No. 2021-00393

Question No. 1

Responding Witness: Stuart A. Wilson

Q-1. Refer to LG&E/KU's response to Commission Staff's Second Request for Information, Item 1 providing the model results for base load and base fuel prices that did not require carbon capture and storage (CCS) with various carbon prices. Identify the carbon price at which the model with base case load forecast and base case fuel prices would select natural gas combined cycle (NGCC) with CCS over NGCC without CCS if the model is allowed to economically select between the two generation resources.

A-1. The following table presents the NGCC units included in the optimal portfolio with CO_2 emissions prices between $15 per short ton and $150 per short ton, with the following two breakeven points highlighted.

- At a CO_2 emissions price of $70 per short ton, NGCC with CCS would begin to be added to the optimal generation portfolio in addition to NGCC without CCS.
- At a CO_2 emissions price of $125 per short ton, the only NGCC units included in the optimal generation portfolio are NGCC with CCS.

At prices between and inclusive of $70 and $120 per short ton, the optimal portfolio includes a mix of NGCC units both with and without CCS.

	NGCC Capacity Added (MW, summer net)	
CO_2 emissions price $/short ton	NGCC without CCS	NGCC with CCS
15	3,078	0
25	3,078	0
50	2,565	0
55	2,565	0
60	2,565	0
65	2,565	0
70	2,052	513
75	1,539	1,026
80	1,539	1,026
85	1,026	1,539
90	1,026	1,539
95	513	2,052
100	513	2,052
105	513	2,052
110	513	2,052
115	513	2,052
120	513	2,052
125	0	2,565
130	0	2,565
135	0	2,565
140	0	2,565
145	0	2,565
150	0	2,565

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's Post-Hearing Request for Information
Dated July 18, 2022

Case No. 2021-00393

Question No. 2

Responding Witness: Stuart A. Wilson

Q-2. Provide the probability of a loss of load event for LG&E/KU's calculated summer economic reserve margin and the probability of a loss of load event for LG&E/KU's calculated winter economic reserve margin, and explain how those probabilities were calculated.

A-2. The minimum of the Companies' summer and winter target reserve margin ranges is the economic reserve margin (i.e., 17% for the summer and 26% for the winter). At this level of reserves, the expected number of loss of load events ("LOLE") over a ten year period is 2.94 in the summer (June through August), 1.27 in the winter (December through February), and 4.33 for all months.

LOLE is the count of days with unserved energy over a ten year period. Loss of load probability ("LOLP") is the proportion of time with a LOLE and varies by season. For a day during the summer, LOLP is 0.32% (i.e., 2.94/(92 days * 10 years)). For a day during the winter, LOLP is 0.14% (1.27/(90 days * 10 years)). On average considering shoulder months, the LOLP is 0.12% (4.33/(365 days * 10 years)).

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's Post-Hearing Request for Information
Dated July 18, 2022

Case No. 2021-00393

Question No. 3

Responding Witness: Stuart A. Wilson

Q-3. Provide the levelized cost of energy (LCOE) for NGCC with CCS in 2022 and 2031 with base and high natural gas prices, as those terms were used in the IRP, and identify the costs used to calculate each such LCOE.

A-3. See the table below for LCOE for NGCC with CCS in 2022 and 2031 with mid and high natural gas prices, assuming 85% capacity factor.

LCOE of NGCC with CCS ($/MWh, 85% Capacity Factor)

Installation Year	Natural Gas Price Forecast	
	Mid	High
2022	71.48	80.30
2031	81.59	93.03

The costs used to calculate LCOE are shown in Table 1 of the Resource Screening Analysis.