

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

**In the Matter of:**

<b>A REVIEW OF THE ADEQUACY OF</b>	)	
<b>KENTUCKY'S GENERATION CAPACITY</b>	)	<b>ADMINISTRATIVE</b>
<b>AND TRANSMISSION SYSTEM</b>	)	<b>CASE NO. 387</b>

**2023 ANNUAL RESOURCE ASSESSMENT FILING  
OF  
LOUISVILLE GAS AND ELECTRIC COMPANY  
PURSUANT TO APPENDIX G  
OF THE COMMISSION'S ORDER  
DATED DECEMBER 20, 2001  
AS AMENDED BY THE  
COMMISSION'S ORDER  
DATED MARCH 29, 2004**

**FILED: MARCH 29, 2024**

VERIFICATION

COMMONWEALTH OF KENTUCKY )
)
COUNTY OF JEFFERSON )

The undersigned, Joshua Boone, being duly sworn, deposes and says that he is Manager – Transmission Strategy and Planning 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.

Handwritten signature of Joshua Boone
Joshua Boone

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 26th day of March 2024.

Handwritten signature of Caroline J. Davison

Notary Public

Notary Public ID No. KYNP 63286

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  
*T. A. Jones*

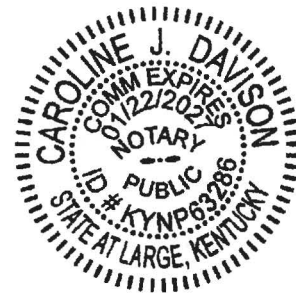
Subscribed and sworn to before me, a Notary Public in and before said County and State, this 26<sup>th</sup> day of March 2024.

Caroline J. Davison  
Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027







**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 1**

The information originally requested in Item 1 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 2**

The information originally requested in Item 2 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 3**

**RESPONDENT: Tim Jones / Michael Sebourn**

3. Actual and weather-normalized monthly coincident peak demands for the just completed calendar year. Demands should be disaggregated into (a) native load demand (firm and non-firm) and (b) off-system demand (firm and non-firm).

Response:

See Table 3, which shows the actual and weather-normalized native Louisville Gas and Electric Company (“LG&E”) peak demands. The normalized native LG&E stand-alone peak demands are available only on a seasonal (summer/winter) basis.

**Table 3 – LG&E Native and Off-System Demands for 2023 (MW)**

Time of Monthly Native Peak	Actual			Normal Weather (Seasonal)	Off-System <sup>1</sup>		
	Native Peak	Non-Firm	Firm	Native Peak	Firm	Non-Firm	Total
1/31/2023 13:00	1,666	0	1,666	1,827	0	0	0
2/1/2023 9:00	1,637	0	1,637		0	0	0
3/20/2023 8:00	1,554	0	1,554		0	128	128
4/20/2023 17:00	1,586	0	1,586		0	140	140
5/31/2023 16:00	2,018	0	2,018		0	0	0
6/2/2023 17:00	2,068	0	2,068		0	1	1
7/28/2023 16:00	2,535	0	2,535		0	350	350
8/25/2023 16:00	2,639	0	2,639	2,527	0	300	300
9/5/2023 17:00	2,189	0	2,189		0	149	149
10/3/2023 17:00	1,947	0	1,947		0	301	301
11/28/2023 20:00	1,538	0	1,538		0	328	328
12/19/2023 9:00	1,614	0	1,614		0	335	335

<sup>1</sup> The allocation of off-system sales between LG&E and KU is handled in the After-the-Fact Billing process in accordance with the Power Supply System Agreement between LG&E and KU. The individual company sales will include an allocation of the sales sourced with purchased power and allocated to the individual company based on each company's contribution to off-system sales.



**LOUISVILLE GAS AND ELECTRIC COMPANY**

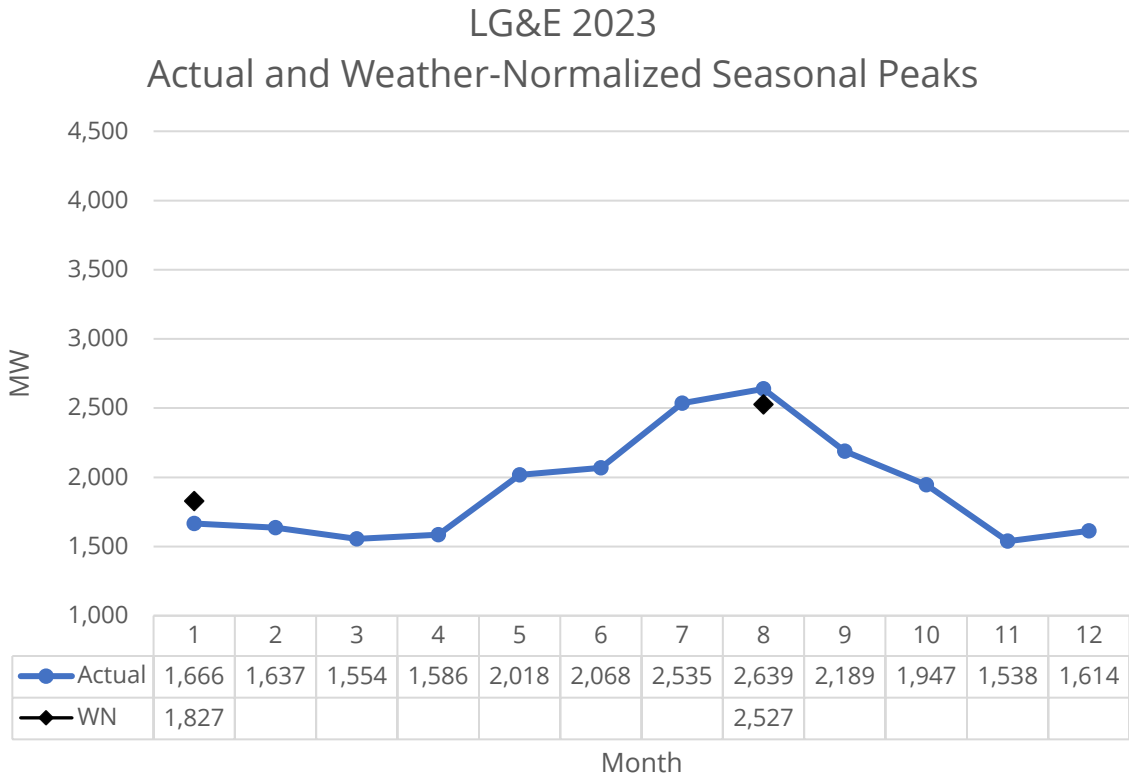
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**ITEM NO. 4**

**RESPONDENT: Tim Jones**

4. Load shape curves that show actual peak demands and weather-normalized peak demands (native load demand and total demand) on a monthly basis for the just completed calendar year.

Response:



**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 5**

The information originally requested in Item 5 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 6**

**RESPONDENT: Tim Jones / Michael Sebourn**

6. Based on the most recent demand forecast, the base case demand and energy forecasts and high case demand and energy forecasts for the current year and the following four years. The information should be disaggregated into (a) native load (firm and non-firm demand) and (b) off-system load (both firm and non-firm demand).

Response:

See the tables below. The base case is similar to the CPCN load forecast. In the high case, load grows at 1% per year.

**Table 6a – LG&E Demand and Energy Forecast**

	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
<b>Base Case Energy Sales (GWh)</b>	11,188	11,097	11,037	11,003	11,004
<b>High Case Energy Sales (GWh)</b>	11,244	11,357	11,470	11,585	11,701
<b>Base Case Energy Requirements (GWh)</b>	11,939	11,829	11,764	11,727	11,727
<b>High Case Energy Requirements (GWh)</b>	11,999	12,119	12,240	12,363	12,486
<b>Base Case Native Peak Demand (MW, Winter)</b>	2,552	2,537	2,532	2,539	2,522
<b>High Case Native Peak Demand (MW, Winter)</b>	2,564	2,590	2,616	2,642	2,669

**Table 6b – Combined Companies' Total Base Case OSS Energy Projection (GWh)**

	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
<b>Existing OSS</b>	0	0	0	0	0
<b>Wholesale OSS</b>	153	336	591	840	1,034
<b>Total OSS</b>	153	336	591	840	1,034

**LOUISVILLE GAS AND ELECTRIC COMPANY**  
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**ITEM NO. 7**

**RESPONDENT: Michael Sebourn**

7. The target reserve margin currently used for planning purposes, stated as a percentage of demand. If changed from what was in use in 2001, include a detailed explanation for the change.

Response:

The Companies have an optimal summer reserve margin range of 17% to 24% and winter reserve margin range of 24% to 35%. The range provides an optimum level of reliability through various system operating conditions.

As part of the 2021 Integrated Resource Plan ("2021 IRP"), the Companies established an optimal summer reserve margin range of 17% to 24% and winter reserve margin range of 26% to 35%. The 2021 IRP was filed with the Commission in October 2021.<sup>2</sup>

In the Companies' 2022 application for a certificate of public convenience and necessity and approval of a DSM plan ("2022 CPCN"), the minimum winter reserve margin target was revised from 26% to 24% based on an updated load forecast and an updated cost of SCCT capacity. The 2022 CPCN was filed in December 2022.<sup>3</sup>

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<sup>2</sup> A detailed explanation of the 2021 IRP's target reserve margin is documented in the report titled, "2021 IRP Reserve Margin Analysis," included in Volume III of the Companies' 2021 IRP. *In re the Matter of: Electronic 2021 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company* Case No. 2021-00393, filed on October 19, 2021.

<sup>3</sup> A detailed explanation of the 2022 CPCN's target reserve margin is documented in the report titled, "2022 Minimum Reserve Margin Analysis," included in Exhibit SAW-1 titled "2022 Resource Assessment." *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 Site Compatibility Certificates and Approval of a Demand Side Management Plan* Case No. 2022-00402, filed on December 15, 2022.

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**ITEM NO. 8**

**RESPONDENT: Michael Sebourn**

8. Projected reserve margins stated in megawatts and as a percentage of demand for the current year and the following 4 years. Identify projected deficits and current plans for addressing these. For each year identify the level of firm capacity purchases projected to meet native load demand.

Response:

See Tables 8a and 8b for the combined Companies. These tables show for each peak season the dispatchable reserve margin, which excludes intermittent and limited-duration resources, and the total reserve margin, which includes all resources using an expected contribution at the time of peak. No reserve margin deficits are projected. The Companies will continue to monitor load requirements and evaluate supply alternatives to address future capacity deficits. The information provided is consistent with the resource plan for which the Companies' received approval in Case No. 2022-00402 (noted in the response to Item No. 7) but reflects the termination of two solar PPAs as noted in the response to Item No. 12.

**Table 8a: Summer Peak Demand and Resource Summary (MW)**

	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
<b>Peak Load</b>	6,204	6,257	6,244	6,238	6,222
<b>Dispatchable Generation Resources</b>					
Existing Resources	7,612	7,612	7,612	7,612	7,612
Retirements/Additions					
Coal <sup>4</sup>	-300	-300	-300	-597	-597
Large-Frame SCCTs	0	0	0	0	0
Small-Frame SCCTs <sup>5</sup>	0	-47	-47	-47	-47
NGCC	0	0	0	645	645
<b>Total</b>	<b>7,312</b>	<b>7,265</b>	<b>7,265</b>	<b>7,613</b>	<b>7,613</b>
Reserve Margin	1,108	1,008	1,021	1,375	1,391
Reserve Margin %	17.9%	16.1%	16.4%	22.0%	22.4%
<b>Intermittent/Limited-Duration Resources</b>					
Existing Resources	105	105	105	105	105
Existing CSR	130	130	130	130	130
Existing Disp. DSM <sup>6</sup>	60	56	52	49	46
Retirements/Additions					
Solar <sup>7</sup>	0	79	407	686	686
Battery Storage	0	0	0	125	125
Dispatchable DSM <sup>6</sup>	14	28	44	70	102
<b>Total</b>	<b>309</b>	<b>397</b>	<b>739</b>	<b>1,165</b>	<b>1,195</b>
<b>Total Supply</b>	<b>7,621</b>	<b>7,662</b>	<b>8,004</b>	<b>8,778</b>	<b>8,808</b>
<b>Total Reserve Margin</b>	<b>1,416</b>	<b>1,405</b>	<b>1,760</b>	<b>2,540</b>	<b>2,586</b>
<b>Total Reserve Margin %</b>	<b>22.8%</b>	<b>22.5%</b>	<b>28.2%</b>	<b>40.7%</b>	<b>41.6%</b>

<sup>4</sup> Mill Creek 1 and 2 cannot be operated simultaneously during ozone season due to NO<sub>x</sub> limits, which results in a reduction of available summer capacity through 2024. Mill Creek 1 is planned to be retired by the end of 2024. Mill Creek 2 is planned to be retired in 2027.

<sup>5</sup> Haefling 1-2 and Paddy's Run 12 are assumed to be retired in 2025.

<sup>6</sup> Dispatchable DSM reflects expected load reductions under normal peak weather conditions.

<sup>7</sup> Solar capacity values reflect 78.6% and 0% expected contribution to summer and winter peak capacity, respectively.

**Table 8b: Winter Peak Demand and Resource Summary (MW)**

	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
<b>Peak Load</b>	5,957	6,048	6,046	6,045	6,043
<b>Dispatchable Generation Resources</b>					
Existing Resources	7,901	7,909	7,909	7,909	7,909
Retirements/Additions					
Coal <sup>4</sup>	0	-300	-300	-300	-597
Large-Frame SCCTs	0	0	0	0	0
Small-Frame SCCTs <sup>5</sup>	0	-55	-55	-55	-55
NGCC	0	0	0	0	660
<b>Total</b>	<b>7,901</b>	<b>7,554</b>	<b>7,554</b>	<b>7,554</b>	<b>7,917</b>
Reserve Margin	1,945	1,506	1,508	1,509	1,874
Reserve Margin %	32.6%	24.9%	25.0%	25.0%	31.0%
<b>Intermittent/Limited-Duration Resources</b>					
Existing Resources	72	72	72	72	72
Existing CSR	130	130	130	130	130
Existing Disp. DSM <sup>6</sup>	22	22	22	22	22
Retirements/Additions					
Solar <sup>7</sup>	0	0	0	0	0
Battery Storage	0	0	0	125	125
Dispatchable DSM <sup>6</sup>	13	26	40	61	89
<b>Total</b>	<b>236</b>	<b>248</b>	<b>262</b>	<b>409</b>	<b>437</b>
<b>Total Supply</b>	<b>8,137</b>	<b>7,802</b>	<b>7,816</b>	<b>7,963</b>	<b>8,354</b>
<b>Total Reserve Margin</b>	<b>2,180</b>	<b>1,754</b>	<b>1,771</b>	<b>1,918</b>	<b>2,311</b>
<b>Total Reserve Margin %</b>	<b>36.6%</b>	<b>29.0%</b>	<b>29.3%</b>	<b>31.7%</b>	<b>38.2%</b>

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**ITEM NO. 9**

The information originally requested in Item 9 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.



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**ITEM NO. 10**

The information originally requested in Item 10 of Appendix G of the Commission's Order dated December 20, 2001, in Administrative Case No. 387, is no longer required pursuant to the Commission's Order of March 29, 2004, amending the previous Order.

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**ITEM NO. 11**

**RESPONDENT: Michael Sebourn**

11. A list that identifies scheduled outages or retirements of generating capacity during the current year and the following four years.

Response:

See attachment being provided in a separate file. The planned maintenance outage schedule for 2024 through 2028 is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection. The schedule is regularly modified based on actual operating conditions, forced outages, changes in the schedule required to meet environmental compliance regulations, fluctuations in wholesale prices, and other unforeseen events.

LG&E's planned retirements are Mill Creek 1 by the end of 2024 and Mill Creek 2 in 2027. Paddy's Run 12 is assumed to retire in 2025. The information provided is consistent with the resource plan for which the Companies' received approval in Case No. 2022-00402 (noted in the response to Item No. 7).

**LOUISVILLE GAS AND ELECTRIC COMPANY**

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**ITEM NO. 12**

**RESPONDENT: Michael Sebourn**

12. Identify all planned base load or peaking capacity additions to meet native load requirements over the next 10 years. Show the expected in-service date, size and site for all planned additions. Include additions planned by the utility, as well as those by affiliates, if constructed in Kentucky or intended to meet load in Kentucky.

Response:

The Companies jointly plan their generation portfolio. The Companies received approval in Case No. 2022-00402 to build, own, and operate a mix of natural gas combined cycle (“NGCC”), solar, and lithium-ion battery storage over the next 10 years. The following is a summary of these projects:

- 125 MW lithium-ion battery in Mercer County anticipated to be in service in 2026. This battery will be fully owned by LG&E but will serve native load energy requirements for both LG&E and KU.
- 120 MW solar facility in Mercer County anticipated to be in service in 2026.
- 645 MW NGCC unit in Jefferson County (“Mill Creek 5”) anticipated to be in service in 2027.
- 120 MW solar facility in Marion County anticipated to be in service in 2027.

In Case No. 2022-00402, the Companies also received approval to enter into four solar PPAs in Kentucky through a PPA rider. Prior to that, the Companies entered into two solar PPAs as part of the Green Tariff Option 3. The table below provides a status update on the development of these solar PPAs.

<p><b>ibV Rhudes Creek</b></p> <ul style="list-style-type: none"> <li>• 100 MW in Hardin County</li> <li>• COD Q1 2025 (only with near-term local approvals)</li> <li>• 75% to two RPA customers; 25% to all LKE customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed 11/2019.</li> <li>• KY Siting Board approved Jan 2023, contingent on local approvals.</li> <li>• ibV awaiting updated Hardin County planning/zoning guidelines.</li> </ul>
<p><b>BrightNight Ragland</b></p> <ul style="list-style-type: none"> <li>• 125 MW in Ballard County</li> <li>• COD 12/31/2026</li> <li>• 100% to five RPA customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed 10/2021.</li> <li>• Location changed from McCracken to Ballard county, adjacent to Gage project (development is independent of Gage).</li> <li>• No local approvals or Siting Board application.</li> <li>• BrightNight proposed a significantly higher price.</li> <li>• Initial discussions with subset of the five RPA customers indicated unwillingness to proceed at higher price; pending confirmation from RPA customers.</li> </ul>
<p><b>Clearway Song Sparrow</b></p> <ul style="list-style-type: none"> <li>• 104 MW in Ballard County</li> <li>• COD 12/31/2027</li> <li>• 100% to all LKE customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed Q1 2023.</li> <li>• KY Siting Board approved Feb 2024, contingent on local approvals.</li> <li>• Terminated by developer 2/28/2024.</li> </ul>
<p><b>BrightNight Gage</b></p> <ul style="list-style-type: none"> <li>• 115 MW in Ballard County</li> <li>• COD 12/31/2026</li> <li>• 100% to all LKE customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed Q1 2023.</li> <li>• Filed notice of intent with KY Siting Board Nov 2023.</li> <li>• Project has seller price reopener; adjacency to Ragland project suggests likely price increase comparable to Ragland. Expect price update summer 2024; LKE not obligated to accept.</li> </ul>
<p><b>ibV Nacke Pike</b></p> <ul style="list-style-type: none"> <li>• 280 MW in Hardin County</li> <li>• COD 1/15/2026</li> <li>• 100% to all LKE customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed Q1 2023.</li> <li>• Awaiting Hardin County planning/zoning guidelines.</li> <li>• Anticipate Siting Board application in Aug 2024.</li> <li>• Seller/buyer price reopener.</li> </ul>
<p><b>ibV Grays Branch</b></p> <ul style="list-style-type: none"> <li>• 138 MW in Hopkins County</li> <li>• COD 1/15/2026</li> <li>• 100% to all LKE customers</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed Q1 2023.</li> <li>• Located on reclaimed coal mining land.</li> <li>• Anticipate Siting Board application in Aug 2024.</li> <li>• Seller/buyer price reopener.</li> </ul>

For the purposes of this response, to account for the Commission’s Order in Case No. 2022-00402,<sup>8</sup> the Companies assume Brown 12 (645 MW NGCC unit) will replace Brown 3 in 2030<sup>9</sup> and assume Ghent 1 and 2 will retire in 2034 (the end of their book depreciation lives). The actual retirement timing of Brown 3 and Ghent 1 and 2 is uncertain and will depend on a number of factors including future environmental

<sup>8</sup> See *Electronic Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan and Approval of Fossil Fuel-Fired Generating Unit Retirements*, Case No. 2022-00402, Order (Ky. PSC Nov. 6, 2023).

<sup>9</sup> From page 137 of the Commission’s Order... “The Commission reiterates that the denial of the CPCN for Brown 12 is wholly based on the Commission’s finding that the construction of Brown 12 should be deferred with the construction beginning on a date that provides for an in-service date in 2030.” Note also that the Companies assumed Brown 3 would retire in 2030 because the Companies cannot operate Brown 3 and Brown 12 simultaneously without certain transmission upgrades.

regulations, customer load, and the economics of keeping these units in service compared to replacing them with new capacity.

The Companies do not currently have a firm plan for further new capacity but will develop a range of potential capacity plans in the 2024 Integrated Resource Plan. The planning process is constantly evolving and may be revised as conditions change and as new information becomes available. Before embarking on a particular course of action, the Companies will evaluate market-available alternatives for providing reliable energy while complying with all regulations in a least-cost manner. Such actions will be supported by specific analyses and will be subject to the appropriate regulatory approval processes.

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**ITEM NO. 13**

**RESPONDENT: Ashley Vinson**

13. The following transmission energy data for the just completed calendar year and the forecast for the current year and the following four years:
- a. Total energy received from all interconnections and generation sources connected to the transmission system.
  - b. Total energy delivered to all interconnections on the transmission system.
  - c. Peak load capacity of the transmission system.
  - d. Peak demand for summer and winter seasons on the transmission system.

Response:

Data exists for 2023. The Company does not forecast this type of data; therefore, no forecast exists for 2024-2028.

- a. LG&E and KU operate as a single NERC Balancing Area that contains several generators not owned by LG&E and KU, which are also included as sources below:

Tie Lines Received (MWH)	18,947,719
Net Generation-LG&E (MWH)	13,160,601
Net Generation-KU (MWH)	18,331,229
Net Generation-KMPA (MWH)	99,055
Net Generation-EKPC (MWH)	<u>36,424</u>
Total Sources (MWH)	50,575,028

- b. LG&E and KU operate as a single Balancing Area; the amount of energy delivered at the interconnections of the single Balancing Area was 16,751,625 MWH(s).
- c. There is no set number for peak load capacity for the transmission system. The system is built to support Network Service and long-term firm Point-to-Point

customers in accordance with the LG&E/KU Transmission Planning Guidelines. Actual transmission capacity available for Network Customers, import, export or thru flow will vary depending on which facilities (generation, load or transmission) in the interconnected transmission system of the eastern interconnect are connected and operated at any given time.

- d. The maximum summer peak transmission load for the combined LG&E/KU transmission system was 7,467 MW for the peak hour of 8/25/2023 at 3:00 p.m.

The maximum winter peak transmission load for the combined LG&E/KU transmission system was 6,074 MW for the peak hour of 12/19/2023 at 9:00 a.m.

**LOUISVILLE GAS AND ELECTRIC COMPANY**

**2023 ANNUAL RESOURCE ASSESSMENT FILING  
PURSUANT TO APPENDIX G OF THE COMMISSION'S ORDER  
DATED DECEMBER 20, 2001, IN ADMINISTRATIVE CASE NO. 387  
AS AMENDED BY THE COMMISSION'S ORDER DATED MARCH 29, 2004  
FILED MARCH 29, 2024**

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**ITEM NO. 14**

**RESPONDENT: Josh Boone**

14. Identify all planned transmission capacity additions for the next 10 years. Include the expected in-service date, size and site for all planned additions and identify the transmission need each addition is intended to address.

Response:

See attachment being provided in a separate file. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.