

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)	CASE NO. 2022-00402
AND APPROVAL OF A DEMAND SIDE)	
MANAGEMENT PLAN AND APPROVAL OF)	
FOSSIL FUEL-FIRED GENERATING UNIT)	
RETIREMENTS)	

RESPONSE OF
KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY
TO
THE SIERRA CLUB'S
POST-HEARING REQUESTS FOR INFORMATION
DATED SEPTEMBER 1, 2023

FILED: SEPTEMBER 15, 2023

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
Charles R. Schram

Subscribed and sworn to before me, a Notary Public in and before said County and State this 14th day of September 2023.

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, **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

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of September 2023.

Caroline J. Davison

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027



**KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Sierra Club's Post-Hearing Requests for Information
Dated September 1, 2023**

Case No. 2022-00402

Question No. 4.1

Responding Witness: Charles R. Schram

- Q.4.1. Please refer to Sierra Club's cross-examination of KU/LG&E witness Stuart A. Wilson beginning at approximately 2:49 PM on August 23, 2023. Please also refer to the graph titled "Daily MWh Lost – Annual Averages and Cold Weather Event Days," located on page 80 of KU/LG&E witness David S. Sinclair's rebuttal testimony.
- a. For each hour from January 1, 2014 to December 31, 2022, inclusive, please provide the total hourly MW on forced outage and the total hourly MW on maintenance outage. If hourly data is impossible to obtain, then please provide the data in daily MWh lost format (separating forced outages from maintenance outages).
 - b. For each year from 2014 to 2022, inclusive, please provide a list of the ten days with the highest total "MWh lost," and the ten days with the highest MW of forced outages.
 - i. For each of those days, please provide a list of units with MWh lost, with, for each:
 - i. Total MWh lost per unit
 - ii. The reason(s) for the outage and/or derate, including planned outage, maintenance outage, and forced outage. For forced outage, please provide a further breakdown: forced outage due to extreme weather (please specify the type of extreme weather, if known), forced outage due to mechanical problems, unavailability due to fuel supply disruption, and any other type of forced outage (with the greatest amount of specificity possible).
 - c. For each year from 2014 to 2022, inclusive, please provide the annual figures for:
 - i. The percentage of MWh lost due to:

- i. Planned outages
- ii. Maintenance outages
- iii. Forced outages due to:
 - A. Extreme weather (please break down by percentage for the type of extreme weather, if known—i.e., 5% due to extreme cold weather, 5% due to extreme heat)
 - B. Mechanical problems
 - C. Fuel supply disruption not caused by extreme weather (if this is not in the forced outage category, then please provide it in its own category)
 - D. Any other type of forced outage (please break down by percentage with greater specificity, if known—i.e., 5% due to strike, 5% for other reasons)
- ii. In each category for the percentage of MWh lost that year, please provide the percentage of MWh lost from a unit that was, at the time of outage, primarily a coal-fired unit, a gas-fired unit, a hydro unit, a solar unit, or other (with, for the “other” category, the maximum specificity possible).
 - i. For example: X% of MWh lost in 2014 due to maintenance outages were due to maintenance outages of coal-fired units; Y% were due to maintenance outages of gas-fired units; etc.
- d. For each “cold weather event day” marked on the graph, please provide:
 - i. The percentage of MWh lost due to:
 - i. Planned outages
 - ii. Maintenance outages
 - iii. Forced outages due to:
 - A. Extreme weather
 - B. Mechanical problems
 - C. Fuel supply disruption not caused by extreme weather (if this is not in the forced outage category, then please provide it in its own category)

D. Any other type of forced outage (please break down by percentage with greater specificity, if known—i.e., 5% due to strike, 5% for other reasons)

ii. For each “cold weather event day,” please provide the percentage of MWh lost from a unit that was, at the time of outage, primarily a coal-fired unit, a gas-fired unit, a hydro unit, a solar unit, or other (with, for the “other” category, the maximum specificity possible).

i. For example: X% of MWh lost in 2014 due to maintenance outages were due to maintenance outages of coal-fired units; Y% were due to maintenance outages of gas-fired units; etc.

A.4.1

a. The Companies use daily, not hourly, lost MWh for reporting purposes. See attachment being provided as a separate file.

b. See the response to part (a).

i. See the response to part (a).

i. See the response to part (a).

ii. See the response to part (a).

c. See attachment being provided as a separate file.

i. See the response to part (c).

i. Planned outages are not included in “Lost MWh” metrics.

ii. Percentage of MWh lost due to maintenance outages:

2014 - 43.37%: 86.62% Coal / 13.38% Gas

2015 - 47.17%: 77.62% Coal / 22.38% Gas

2016 - 37.43%: 63.56% Coal / 36.44% Gas

2017 - 55.37%: 30.50% Coal / 69.50% Gas

2018 - 51.27%: 66.22% Coal / 33.78% Gas

2019 - 48.82%: 62.34% Coal / 37.66% Gas

2020 - 70.48%: 62.84% Coal / 37.16% Gas

2021 - 60.77%: 69.13% Coal / 30.87% Gas

2022 - 50.72%: 42.49% Coal / 57.51% Gas

iii. Percentage of MWh lost due to forced outages and derates:

2014 – 56.63%: 84.08% Coal / 15.92% Gas

2015 – 52.83%: 59.23% Coal / 40.77% Gas

2016 – 62.57%: 73.76% Coal / 26.24% Gas

2017 – 44.63%: 71.59% Coal / 28.41% Gas

2018 – 48.73%: 69.04% Coal / 30.96% Gas
2019 – 51.18%: 61.13% Coal / 38.87% Gas
2020 – 29.52%: 58.66% Coal / 41.34% Gas
2021 – 39.23%: 66.23% Coal / 33.77% Gas
2022 – 49.28%: 62.68% Coal / 37.32% Gas

A. No events attributable to extreme hot weather.

Percentage of forced MWh lost due to cold weather:

2014 – 00.13%: 28.80% Coal / 71.20% Gas
2015 – 00.20%: 42.13% Coal / 57.87% Gas
2016 – 00.08%: 00.00% Coal / 100.0% Gas
2017 – 00.02%: 00.00% Coal / 100.0% Gas
2018 – 00.11%: 69.74% Coal / 30.26% Gas
2019 – 00.07%: 00.00% Coal / 100.0% Gas
2020 – 00.61%: 00.00% Coal / 100.0% Gas
2021 – 00.09%: 00.00% Coal / 100.0% Gas
2022 – 00.51%: 57.41% Coal / 42.59% Gas

B. Percentage of forced MWh lost due to mechanical issues:

2014 – 99.59%: 84.40% Coal / 15.60% Gas
2015 – 95.89%: 61.68% Coal / 38.32% Gas
2016 – 97.51%: 75.65% Coal / 24.35% Gas
2017 – 99.98%: 71.61% Coal / 28.39% Gas
2018 – 99.89%: 69.04% Coal / 30.96% Gas
2019 – 99.93%: 61.17% Coal / 38.83% Gas
2020 – 99.39%: 59.02% Coal / 40.98% Gas
2021 – 97.97%: 65.62% Coal / 34.38% Gas
2022 – 96.62%: 64.57% Coal / 35.43% Gas

C. Percentage of forced MWh lost due to fuel supply disruption:

2014 – 00.28%: 00.00% Coal / 100.0% Gas¹
2015 – 02.42%: 00.00% Coal / 100.0% Gas¹
2016 – 01.54%: 00.00% Coal / 100.0% Gas¹
2017 – 0%
2018 – 0%
2019 – 0%
2020 – 0%
2021 – 0%

¹ Paddy's Run 11, 12, and 13 were served by the LG&E LDC per special contract prior to November 2016; at times, high LDC demand resulted in reduced supply to these units. These units were connected to the Texas Gas Transmission interstate pipeline in November 2016.

2022 – 02.87%: 00.00% Coal / 100.0% Gas

D. Percentage of forced MWh lost due to other issues:

- 2014 – 0%
- 2015 – 01.48%: 00.00% Coal / 100.0% Gas²
- 2016 – 00.87%: 00.00% Coal / 100.0% Gas²
- 2017 – 0%
- 2018 – 0%
- 2019 – 0%
- 2020 – 0%
- 2021 – 01.94%: 100.0 Coal / 00.00% Gas³
- 2022 – 0%

ii. See responses to parts A-D for coal and gas unit data. MWh lost data is not tracked for hydro and solar units.

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

d.

i. Note that the cold weather event days included on the graph were intended to show outages that occurred during cold weather on each particular event day, not ongoing outages that occurred prior to the event.

i. Planned outages are not included in “MWh lost” metrics. Furthermore, no planned outages occurred on any cold weather event day displayed on the graph.

ii. Percentage of MWh lost due to maintenance outages:

- 1/6/2014: 0%
- 1/7/2014: 0%
- 2/19/2015: 0%
- 2/20/2015: 0%
- 12/23/2022: 0%

iii. Percentage of MWh lost due to forced outages and derates:

- 1/6/2014: 100%
- 1/7/2014: 100%
- 2/19/2015: 100%
- 2/20/2015: 100%
- 12/23/2022: 100%

² The Trimble County combustion turbines were limited by 3 MW each during winter of 2015/2016 due to insufficient Network Integration Transmission Service (NITS). Additional NITS was reserved prior to winter of 2016/2017.

³ Mill Creek diver incident 07/15/2021

A. Percentage of forced MWh lost due to cold weather:

1/6/2014: 8%
1/7/2014: 21%
2/19/2015: 34%
2/20/2015: 0%
12/23/2022: 11%

B. Percentage of forced MWh lost due to mechanical issues:

1/6/2014: 92%
1/7/2014: 79%
2/19/2015: 66%
2/20/2015: 100%
12/23/2022: 40%

C. Percentage of forced MWh lost due to fuel supply disruption:

1/6/2014: 0%
1/7/2014: 0%
2/19/2015: 0%
2/20/2015: 0%
12/23/2022: 49% (low gas pressure on interstate pipeline)

D. Percentage of forced MWh lost due to other issues:

1/6/2014: 0%
1/7/2014: 0%
2/19/2015: 0%
2/20/2015: 0%
12/23/2022: 0%

ii. The MWh lost data does not include metrics for hydro and solar. Ohio Falls hydro units are subject to reductions due to U.S. Army Corps of Engineers instructions; the Brown Solar facility output may be reduced due to clouds or icing on the solar panels. For example, on 12/27/2017, the Brown solar facility produced 53.8 MWh, its highest energy production on a late December day. The 16.4 MWh produced on 12/23/2022 represents a 70 percent reduction from that high. That reduction in energy produced is not classified as “MWh lost”.

i. 1/6/2014: 29% of MWh lost from coal units; 71% of MWh lost from gas units.

1/7/2014: 55% of MWh lost from coal units; 45% of MWh lost from gas units.

2/19/2015: 4% of MWh lost from coal units; 96% of MWh lost from gas units.

2/20/2015: 40% of MWh lost from coal units; 60% of MWh lost from gas units.

12/23/2022: 13% of MWh lost from coal units; 87% of MWh lost from gas units.

For the supporting workpaper, see the attachment being provided in a separate file.

**KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY**

**Response to Sierra Club’s Post-Hearing Requests for Information
Dated September 1, 2023**

Case No. 2022-00402

Question No. 4.2 (numbering of data request corrected)

Responding Witness: David S. Sinclair

- Q.4.2 Please refer to Sierra Club’s cross-examination of KU/LG&E witness David S. Sinclair beginning at approximately 1:36 PM on August 28, 2023. Please provide all times on December 23, 2023, at which the Companies were selling power and the amount of power sold by hour throughout the day.
- A.4.2 The Companies sold the following volumes of power on December 23, 2022, not including sales to TVA associated with reserve sharing.

12/23/2022 Hour Ending	Off System Sales (MWh)
1	399
2	800
3	1,000
4	725
5	300