



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matters of:

ELECTRONIC REVIEW OF THE ADEQUACY)	Administrative
OF KENTUCKY'S GENERATION CAPACITY)	Case No.
AND TRANSMISSION SYSTEM)	2000-00387

**SUPPLEMENTAL INFORMATION PROVIDED WITH
BIG RIVERS' ANNUAL FINANCIAL AND STATISTICAL REPORT
PURSUANT TO ADMINISTRATIVE CASE NO. 2000-00387**

FILED: February 28, 2024

BIG RIVERS ELECTRIC CORPORATION

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**Response to Commission Staff's Information Request
as set forth in
Appendix G of the Commission's Order dated December 20, 2001**

February 28, 2024

1 **Item 1)** *Actual and weather-normalized energy sales for the just*
2 *completed calendar year. Sales should be disaggregated into native load*
3 *sales and off-system sales. Off-system sales should be further disaggregated*
4 *into full requirements sales, firm capacity sales, and non-firm or economy*
5 *energy sales. Off-system sales should be further disaggregated to identify*
6 *separately all sales where the utility acts as a reseller, or transporter, in a*
7 *power transaction between two or more other parties.*

8

9 **Response)** The information originally requested in the above item of Appendix G of
10 the Commission's Order dated December 20, 2001, in Administrative Case No. 2000-
11 00387, ("the December 2001 Order in Admin. Case 387") is no longer required
12 pursuant to Ordering Paragraph No. 5 of the Commission's Order dated March 29,
13 2004, amending the December 2001 Order in Admin. Case 387.

14

15 **Respondent)** Terry Wright, Jr.

16

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1 **Item 2)** *A summary of monthly power purchases for the just completed*
2 *calendar year. Purchases should be disaggregated into firm capacity*
3 *purchases required to serve native load, economy energy purchases, and*
4 *purchases where the utility acts as a reseller, or transporter, in a power*
5 *transaction between two or more other parties.*

6

7 **Response)** The information originally requested in the above item of Appendix G of
8 the December 2001 Order in Admin. Case 387 is no longer required pursuant to
9 Ordering Paragraph No. 5 of the Commission's Order dated March 29, 2004,
10 amending the December 2001 Order in Admin. Case 387.

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13 **Respondent)** Terry Wright, Jr.

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1 **Item 3)** *Actual and weather-normalized monthly coincident peak*
2 *demands for the just completed calendar year. Demands should be*
3 *disaggregated into*

4 *a. native load demand (firm and non-firm) and*

5 *b. off-system demand (firm and non-firm).*

6

7 **Response)** The attached Table 3-G shows the actual and weather normalized native
8 load demand and the off-system coincident demand for 2023. Native load is
9 comprised of the Big Rivers' Members' rural and industrial load served under LIC,
10 LICSS, and LICX tariffs. Big Rivers sells its power into the Midcontinent
11 Independent System Operator, Inc. ("MISO") market and, therefore, the off-system
12 sales cannot be weather normalized. Off-system demand is comprised of three
13 components: (i) forward bilateral sales which are characterized as firm, (ii) sales to
14 Nebraska customers which are served in the SPP market and can be characterized
15 as firm, and (iii) off-system sales due to generation clearing in the MISO market

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1 which is in excess of Big Rivers' load and are a result of Big Rivers' compliance with
2 its MISO tariff obligations.

3

4

5 **Respondent)** Terry Wright, Jr.

6

**Big Rivers Electric Corporation
Administrative Case No. 387
Table 3-G
Native Peak and Off-System Sales
Weather Normalized**

**Total Native Load and Off-System Coincident Peak Demands ¹ (MW)
Filed February 28, 2024**

Month	Peak Date	Native Load		Firm ²	Off-System Sales		
		All Firm Peak Demand	Weather Normalized		Off-System Demand	Sales to MISO ³	Sales in SPP ⁴
Jan-23	01/31/23	559	633	179	0	59	0
Feb-23	02/03/23	535	583	180	0	55	0
Mar-23	03/20/23	565	571	170	433	33	0
Apr-23	04/20/23	468	467	184	0	37	0
May-23	05/31/23	613	615	223	115	61	0
Jun-23	06/30/23	634	635	246	3	46	0
Jul-23	07/27/23	755	758	258	0	84	0
Aug-23	08/21/23	736	741	253	135	62	0
Sep-23	09/29/23	651	673	212	0	43	0
Oct-23	10/03/23	556	551	217	16	42	0
Nov-23	11/28/23	636	632	165	0	46	0
Dec-23	12/20/23	663	712	170	0	55	0

Notes -

- 1.- Native Load includes Transmission Losses
- 2.- Off System Firm Sales are Pre-arranged bilateral sales
- 3.- Net Sales at generator nodes
- 4.- Off System Sales to Nebraska customers in SPP at Big Rivers' peak hour

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

4

5 **Response)** The attached Graph 4-G shows the monthly native load demand, along
6 with the monthly weather normalized native load demand for 2023.

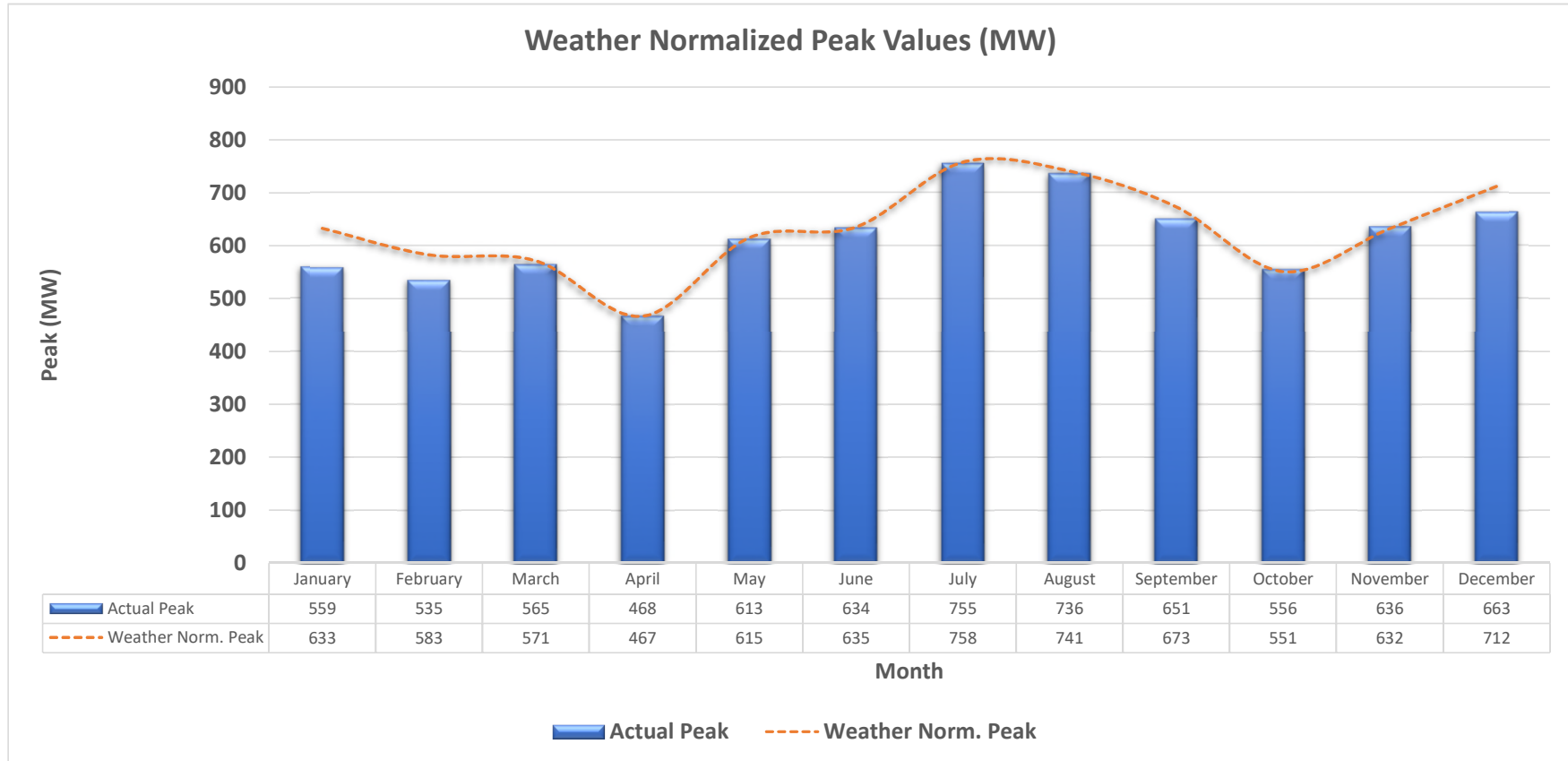
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9 **Respondent)** Terry Wright, Jr.

10

Big Rivers Electric Corporation
Administrative Case No. 387
Graph 4-G
Actual versus Weather Normalized Peak Demand



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1 **Item 5)** *Load shape curves showing the number of hours that native load*
2 *demand exceeded these levels during the just complete calendar year:*

3 *a. 70% of the sum of installed generating capacity plus firm capacity*
4 *purchases;*

5 *b. 80% of the sum of installed generating capacity plus firm capacity*
6 *purchases;*

7 *c. 90% of the sum of installed generating capacity plus firm capacity*
8 *purchases.*

9

10 **Response)** The information originally requested in the above item of Appendix G of
11 the December 2001 Order in Admin. Case 387 is no longer required pursuant to
12 Ordering Paragraph No. 5 of the Commission's Order dated March 29, 2004,
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1 **Item 6)** *Based on the most recent demand forecast, the base case demand*
2 *and energy forecasts and high case demand and energy forecasts for the*
3 *current year and the following four years. The information should be*
4 *disaggregated into*

5 *a. Native load (firm and non-firm demand) and*

6 *b. Off-system load (both firm and non-firm demand).*

7

8 **Response)** The attached Table 6-G tabulates the forecasted base case and high case
9 demand and energy in the associated demand breakdowns as requested.

10

11

12 **Respondent)** Terry Wright, Jr.

13

Big Rivers Electric Corporation
Administrative Case No. 2000-00387
Table 6-G
Total Native Load and Off-System Loads
Base and High Case Forecasts

	Native Load				Off-System Load Demand			
	Base Case		High Case		Base Case		High Case	
	Demand (MW)	Energy (MWH)	Demand (MW)	Energy (MWH)	Firm Demand (MW)	Non-Firm Demand (MW)	Firm Demand (MW)	Non-Firm Demand (MW)
2024	747	4,120,757	816	4,282,951	177	0	177	0
2025	755	4,313,766	823	4,474,443	252	0	252	0
2026	757	4,493,117	824	4,653,051	252	0	252	0
2027	758	4,498,116	825	4,657,394	100	0	100	0
2028	760	4,507,603	827	4,666,418	100	0	100	0

Notes and Assumptions

Native Base case:

Demand and Energy include Native Load without Transmission Losses

Demand is Big Rivers' forecasted peak coincident with MISO (MISO Requirement)

Firm Off-System Load Demand consists of executed long term sales to KYMEA, OMU, and Executed Net Bilateral Short Term Capacity Transactions

Excess generation sales to MISO are not projected as they will be contingent upon unit availability at time of system peak and can vary significantly

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

4

5 **Response)** MISO's seasonal construct, case number ER22-495-000 filed by MISO in
6 November, 2021 and accepted by FERC in September 2022, introduced seasonal
7 requirements to the Planning Resource Auction ("PRA") to account for the unique risk
8 profile of each season.

9 The current summer target reserve margin used for planning purposes is
10 17.7% based on Installed Capacity ("ICAP")¹ Ratings of resources, and 9.0% based on
11 Unforced Capacity ("UCAP")² Ratings, as specified by MISO for the upcoming
12 planning year effective June 1, 2024. MISO annually determines seasonal minimum
13 Planning Reserve Margin ("PRM") that would result in the MISO system

¹ ICAP represents physical generating capacity adjusted for ambient weather conditions (high level definition)

² UCAP represents the percentage of ICAP available after a unit's forced outage rate is taken into account (high level definition).

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1 experiencing annually a less than one-day loss-of-load event (“LOLE”) every 10 years,
2 per the MISO Tariff. To determine the LOLE targets for each season that will be
3 used to calculate the PRM and Local Reliability Requirements (“LRR”), MISO
4 followed the process first solving the LOLE model to an annual value of 0.1 and then
5 checking the seasonal distribution. If a season had an LOLE value of at least 0.01,
6 then its target would be set to that LOLE. If a season had less than 0.01 LOLE,
7 additional analysis was performed until the target of 0.01 LOLE was met. Big Rivers
8 is located in MISO Local Resource Zone 6, and the seasonal LOLE targets determined
9 in the Planning Year 2024-2025 LOLE study are shown in table 3-6, below:

Region	Summer	Fall	Winter	Spring
MISO-wide	0.1	0.01	0.01	0.01
LRZ 1	0.094	0.01	0.01	0.01
LRZ 2	0.099	0.01	0.01	0.01
LRZ 3	0.091	0.01	0.01	0.01
LRZ 4	0.022	0.01	0.075	0.01
LRZ 5	0.01	0.01	0.083	0.01
LRZ 6	0.085	0.01	0.015	0.01
LRZ 7	0.037	0.061	0.01	0.01
LRZ 8	0.014	0.01	0.078	0.01
LRZ 9	0.042	0.036	0.014	0.01
LRZ 10	0.058	0.019	0.015	0.01

Table 3-6: Planning Year 2024-2025 Seasonal LOLE Distribution

10

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1 The Planning Reserve margin changes over time, and its history is shown in
2 Figure 4-1 reproduced below, which is from MISO 2024–2025 Loss of Load
3 Expectation Study Report. *The link to MISO's 2024-2025 LOLE Report is:*
4 <https://cdn.misoenergy.org/LOLE%20Study%20Report%20PY%202024-2025631112.pdf>
5

6

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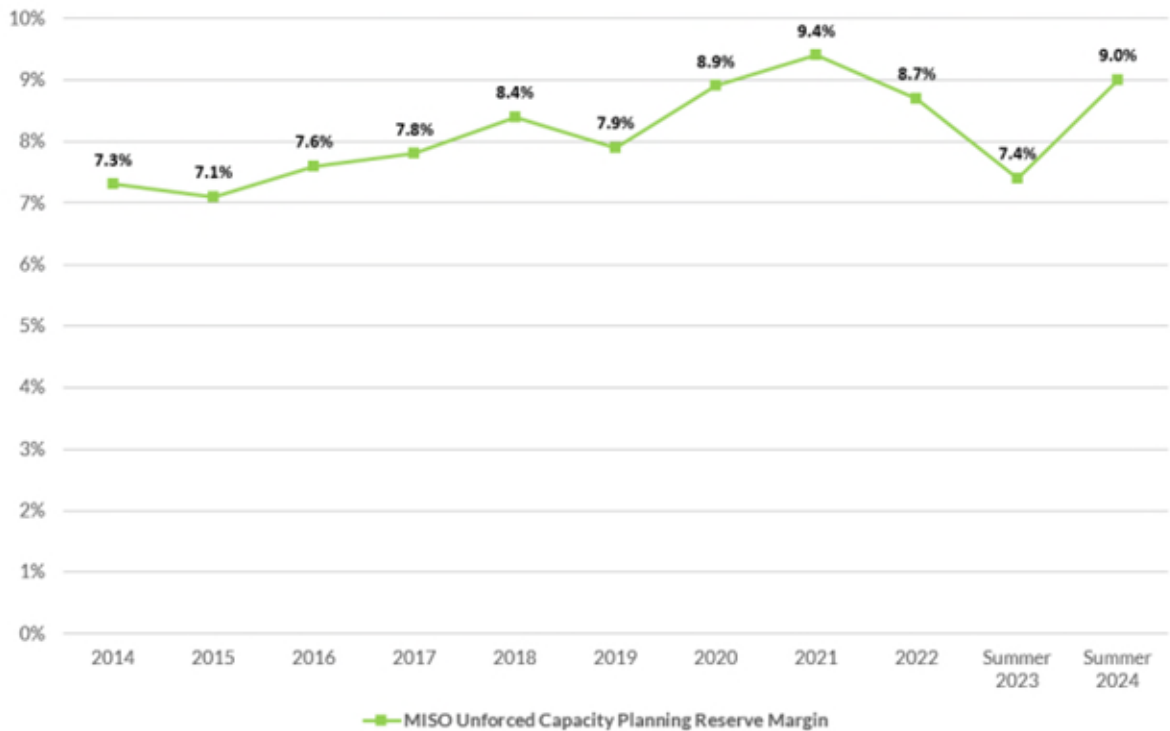
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1

2

Figure 4-1 Comparison of PRM Targets across 10 years³



3

4

5 **Respondent)** Terry Wright, Jr.

³ Figure 4-1 compares the PRM UCAP values over the last 10 Planning Years. The last endpoint of the green line shows the Planning Year 2023-2024 Summer PRM value.

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

6

7 **Response)** Please see Table 1, on the following page. Reserve Margin MWs are
8 calculated as summer seasonally accredited capacity ("SAC") of available resources
9 minus Base Demand and net Firm Capacity Sales. The purchase of 160 MW of solar
10 capacity and energy is included as a portion of available unforced capacity. As shown
11 in the far right column in Table 1, Big Rivers is not projecting any SAC deficits in its
12 Native Capacity Position.¹

13

¹ Native Capacity Position does not take it account [REDACTED]

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- 1 Big Rivers will make bilateral capacity purchases or participate in the annual
- 2 MISO Planning Resource Auction to alleviate any shortages and will meet the MISO
- 3 Planning Reserve Margin Requirements including transmission losses.

Year	Reserve Margin (Summer SAC MW)¹	Reserve Margin (%)	MISO Reserve Margin Requirement ² (UCAP%)	Firm Capacity Purchases (MW) ³	Projected Purchases (MW) ⁴	Projected Deficit (MW)
2024	70	9%	11.0%	178		0
2025	68	9%	11.0%	178		0
2026	26	3%	11.0%	178		0
2027	174	23%	11.0%	178		0
2028	169	22%	11.0%	178		0

4

¹ Summer UCAP set at Summer 2024 SAC accreditation values for all years presented

² MISO reserve margin Requirement includes transmission Losses. PRMR remains at 2024 levels for future years.

³ Southeastern Power Administration ("SEPA") Cumberland Hydropower allocation at 2024 accredited capacity.

⁴

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1

2

3 **Respondent)** Terry Wright, Jr.

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1 **Item 9)** *By date and hour, identify all incidents during the just completed*
2 *calendar year when reserve margin was less than the East Central Area*
3 *Reliability Council's ("ECAR") 1.5% spinning reserve requirement. Include*
4 *the amount of capacity resources that were available, the actual demand on*
5 *the system, and the reserve margin, stated in megawatts and as a percentage*
6 *of demand. Also, identify system conditions at the time.*

7

8 **Response)** The information originally requested in the above item of Appendix G of
9 the December 2001 Order in Admin. Case 387 is no longer required pursuant to
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1 **Item 10)** *A list identifying and describing all forced outages in excess of*
2 *two hours in duration during the just completed calendar year.*

3

4 **Response)** The information originally requested in the above item of Appendix G of
5 the December 2001 Order in Admin. Case 387 is no longer required pursuant to
6 Ordering Paragraph No. 5 of the Commission's Order dated March 29, 2004,
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10 **Respondent)** Jeffrey S. Brown

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

3

4 **Response)** The planned maintenance outage schedule for 2024 through 2028 is
5 being filed with a Motion for Confidential Treatment. The schedule is regularly
6 modified based on actual operating conditions, forced outages, changes in the
7 schedule required to meet environmental regulation compliance, fluctuation in
8 wholesale capacity and energy prices, and other unforeseen events that may affect
9 unit reliability or generation capacity. The scheduled outages are listed in the tables
10 which follow.

11

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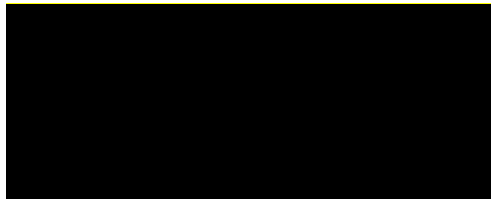
February 28, 2024

1

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Wilson Unit 1

2024
2025
2026
2027
2028

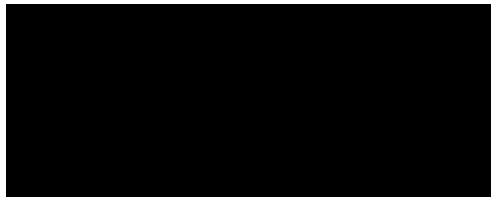


3

4

Green Unit 1

2024
2025
2026
2027
2028

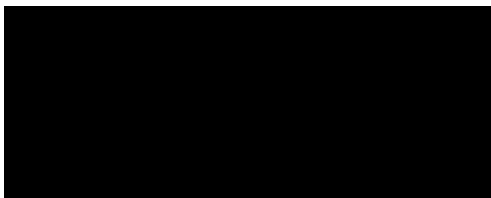


5

6

Green Unit 2

2024
2025
2026
2027
2028



7

8

9 **Respondent)** Jeffrey S. Brown

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

6

7 **Response)** In Case No. 2022-00296,⁹ Big Rivers sought and received Commission
8 approval of an amendment to a solar purchase power agreement, the “Unbridled
9 PPA,” that was originally approved in Case No. 2020-00183.¹⁰ The Unbridled Solar
10 160 MW facility in Henderson County, Kentucky is currently in the DPP–2020¹¹
11 cycle of MISO Interconnection studies and is expected to begin operations in the
12 first quarter of 2025.

⁹ *In the Matter of: Electronic Application of Big Rivers Electric Corporation for Approval of Amendment to Power Purchase Agreement*, P.S.C. Case No. 2022-00296, Order (June 13, 2023).

¹⁰ *In the Matter of: Electronic Application of Big Rivers Electric Corporation for Approval of Solar Power Contracts*, P.S.C. Case No. 2020-00183, Order (Sept. 28, 2020).

¹¹ DPP = Definitive Planning Phase.

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1 As discussed in Big Rivers' 2023 Integrated Resource Plan,¹² Big Rivers
2 submitted a Inflation Reduction Act's PACE program letter of intent in June 2023,
3 related to a proposed 100 MW solar plus 50 MW storage project to potentially be
4 located in McCracken County, Kentucky and be online no earlier than 2028.¹³ Big
5 Rivers' IRP Base Portfolio also includes the addition of a 635 MW natural gas
6 combined cycle generator, which would be located near Big Rivers' Sebree plant
7 location.¹⁴ If this facility were to get built, it would likely be completed sometime
8 between 2029 and 2032. These potential resource additions are both currently still
9 under review. Big Rivers will submit to the Commission the required requests for
10 Certificates of Public Convenience and Necessity.

11

12

13 **Respondent)** Terry Wright, Jr.

¹² *In the Matter of: Big Rivers Electric Corporation's 2023 Integrated Resource Plan*, P.S.C.
Case No. 2023-00310.

¹³ *Big Rivers' 2023 IRP* at pages 120 and 143.

¹⁴ *Id.* at page 142.

BIG RIVERS ELECTRIC CORPORATION

**SUPPLEMENTAL INFORMATION PROVIDED WITH
BIG RIVERS' ANNUAL FINANCIAL AND STATISTICAL REPORT
PURSUANT TO ADMINISTRATIVE CASE NO. 2000-00387 –
ELECTRONIC REVIEW OF THE ADEQUACY OF KENTUCKY'S
GENERATION CAPACITY AND TRANSMISSION SYSTEM**

**Response to Commission Staff's Information Request
as set forth in
Appendix G of the Commission's Order dated December 20, 2001**

February 28, 2024

1 **Item 13)** *The following transmission energy data for the just completed*
2 *calendar year and the forecast for the current year and the following four*
3 *years:*

4 *a. Total energy received from all interconnections and generation*
5 *sources connected to the transmission system;*

6 *b. Total energy delivered to all interconnections on the transmission*
7 *system;*

8 *c. Peak load capacity of the transmission system; and*

9 *d. Peak demand for summer and winter seasons on the transmission*
10 *system.*

11

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February 28, 2024

1 **Response)**

2 a.

Transmission System Energy Received (MWh)

	<u>Generation</u>	<u>Interconnections</u>	<u>Total</u>
2023	3,179,276	10,144,911	13,324,187
	<u>Projected System Energy Received (MWh)</u>		
2024			14,291,387
2025			14,531,387
2026			16,043,387
2027			16,043,387
2028			16,043,387

3

4 b.

Transmission System Energy Delivered at Interconnections
(MWh)

	<u>Total</u>
2023	6,104,547

Projected System Energy Delivered at Interconnection
(MWh)

2024	6,104,000
2025	7,307,000
2026	7,635,000
2027	8,049,500
2028	8,049,500

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ELECTRONIC REVIEW OF THE ADEQUACY OF KENTUCKY'S
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February 28, 2024

1

2 c.

Transmission Peak Capacity (MW)

2023 2,903

Projected Transmission Peak Capacity (MW)

2024 2,903

2025 2,903

2026 2,903

2027 2,903

2028 2,903

3

4 d.

Transmission System Peak Demand (MW)

	<u>Winter</u>	<u>Summer</u>
2023	1,141	1,291

Projected System Peak Demand (MW)

	<u>Winter</u>	<u>Summer</u>
2024	1,319	1,346
2025	1,340	1,367
2026	1,541	1,569
2027	1,542	1,571
2028	1,544	1,574

5

6 Respondent) Jeffrey K. Fulkerson

BIG RIVERS ELECTRIC CORPORATION

**SUPPLEMENTAL INFORMATION PROVIDED WITH
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PURSUANT TO ADMINISTRATIVE CASE NO. 2000-00387 –
ELECTRONIC REVIEW OF THE ADEQUACY OF KENTUCKY'S
GENERATION CAPACITY AND TRANSMISSION SYSTEM**

**Response to Commission Staff's Information Request
as set forth in
Appendix G of the Commission's Order dated December 20, 2001**

February 28, 2024

1 **Item 14)** *Identify all planned transmission capacity additions for the next*
2 *ten years. Include the expected in-service date, size and site for all planned*
3 *additions and identify the transmission need each addition is intended to*
4 *address.*

5

6 **Response)** A confidential listing of Big Rivers' planned Transmission Capacity
7 Additions for 2024 through 2033 is being filed with a Motion for Confidential
8 Treatment.

9

10

11 **Respondent)** Jeffrey K. Fulkerson

12



In the Matter of:

A REVIEW OF THE ADEQUACY OF)	Administrative
KENTUCKY'S GENERATION CAPACITY)	Case No.
AND TRANSMISSION SYSTEM)	2000-00387

**SUPPLEMENTAL INFORMATION PROVIDED WITH
BIG RIVERS' ANNUAL FINANCIAL AND STATISTICAL REPORT
PURSUANT TO ADMINISTRATIVE CASE NO. 2000-00387**

CONFIDENTIAL RESPONSE

**Attachment to Item 14 of the
Commission Staff's Information Request
as set forth in Appendix G of the
Commission's Order dated December 20, 2001
FILED: February 28, 2024**

**INFORMATION FILED WITH
MOTION FOR CONFIDENTIAL TREATMENT**

BIG RIVERS ELECTRIC CORPORATION

**SUPPLEMENTAL INFORMATION PROVIDED WITH
BIG RIVERS' ANNUAL FINANCIAL AND STATISTICAL REPORT
PURSUANT TO ADMINISTRATIVE CASE NO. 2000-00387 –
A REVIEW OF THE ADEQUACY OF KENTUCKY'S GENERATION
CAPACITY AND TRANSMISSION SYSTEM**

**Response to Commission Staff's Information Request
as set forth in
Appendix G of the Commission's Order dated December 20, 2001**

February 28, 2024

1 **Supplemental Item 1)** *Provide a detailed discussion of the consideration*
2 *given to price elasticity in the forecasted demand, energy, and reserve margin*
3 *information above.*

4

5 **Response)** The information originally requested by letter dated May 13, 2013, in
6 Admin. Case 387 is no longer required pursuant to Ordering Paragraph No. 2 of the
7 Commission's Order dated April 8, 2022, relieving the parties from the annual price
8 elasticity reporting requirement.

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11 **Respondent)** Terry Wright, Jr.

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