



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

**AN ELECTRONIC EXAMINATION OF THE)
APPLICATION OF THE FUEL ADJUSTMENT)
CLAUSE OF BIG RIVERS ELECTRIC) Case No.
CORPORATION FROM NOVEMBER 1, 2020) 2023-00013
THROUGH OCTOBER 31, 2022)**

DIRECT TESTIMONY

OF

**TERRY WRIGHT JR.
INTERIM VICE PRESIDENT OF ENERGY SERVICES**

ON BEHALF OF

BIG RIVERS ELECTRIC CORPORATION

**PURSUANT TO ORDERING PARAGRAPH NO. 4
OF THE COMMISSION'S SEPTEMBER 6, 2023, ORDER**

FILED: September 22, 2023

1 **Q. Briefly describe your education and work experience.**

2 A. I have a Bachelor's Degree in Mathematics with a minor in Computer Science
3 from Missouri State University. I have a Master's Degree in Mathematics
4 from Missouri State University and a Master's Degree in Finance, focus on
5 Financial Risk Management, from the University of Tulsa. I have 15 years'
6 worth of work experience in the Power Markets and have traded power and
7 performed market submissions in ERCOT, SPP, and MISO. My two most
8 recent experiences were at Empire District Electric Company in Joplin,
9 Missouri and then Cooperative Energy in Hattiesburg, Mississippi. I began
10 my career at Big Rivers in January 2023 as Director of Resources and
11 Forecasting and was promoted to Interim Vice President of Energy Services
12 in August 2023.

13

14 **Q. Have you previously testified before this Commission?**

15 A. No. I have never testified before the Kentucky Commission.

16

17 **Q. What is the purpose of your testimony in this proceeding?**

18 A. The purpose of my testimony is to respond to the following subparts of
19 Ordering Paragraph No. 4 of the Commission's Order dated September 6,
20 2023, in this matter:

21 (f) Any changes in the wholesale electric power market that
22 occurred during the review period or that BREC expects to occur

1 within the next two years that have significantly affected or will
2 significantly affect BREC's electric power procurement practices.

3 (g) Actions taken by BREC to mitigate purchased power related costs
4 for its customers.

5 (h) Any planned outages that extended beyond the estimated
6 time of the outage and how BREC addressed the extended outage,
7 and any resulting capacity and energy shortfalls.

8 (i) Whether BREC engaged in any off systems sales or
9 intersystem sales to offset high fuel or power costs during the
10 period under review.

11 (j) How BREC bids its generating units into MISO energy
12 markets, including, but not limited to the following: how BREC
13 determines the manner in which individual generating units are
14 offered into MISO's day ahead market (must run, economic
15 dispatch etc.); who makes those decisions; and what level of
16 control MISO has over the dispatch of BREC's generating units.

17 (l) Any cost/benefit analysis BREC has performed regarding its
18 participation in MISO.

19

20 **Q. Discuss any changes in the wholesale electric power market that**
21 **occurred during the review period or that BREC expects to occur**
22 **within the next two years (i.e., 2024 and 2025) that have significantly**

1 affected or will significantly affect BREC's electric power
2 procurement practices.

3 A. Spot Henry Hub gas prices are currently trading below \$3/MMBTu. Forward
4 curves show these gas prices [REDACTED] by the end of the
5 year and staying above this amount through the balance of the year. Since
6 gas and power prices are strongly correlated, we [REDACTED]
7 [REDACTED] On top of
8 this, we have seen quite a few coal retirements in 2023. Most of these
9 retirements have been in the PJM Market, but MISO typically imports power
10 from PJM on a daily basis so any tightening in the PJM Market will impact
11 the MISO Market. [REDACTED]

12 [REDACTED]

13 The MISO Capacity Market for Zone 6 cleared very low for PY23-24
14 with Summer Capacity Prices settling at \$10/MW-Day, Fall Capacity Prices
15 settling at \$15/MW-Day, Winter Capacity Prices settling at \$2/MW-Day, and
16 Spring Capacity Prices settling at \$10/MW-Day. MISO is currently engaging
17 stakeholders in the Resource Adequacy Subcommittee ("RASC") on
18 Reliability Based Demand Curves ("RDBC") with a plan to file changes with
19 FERC sometime in September 2023 with a target implementation of PY25-
20 26. One of the major items in this RDBC construct is the move from a vertical
21 demand curve to a sloped demand curve which will place value on the
22 marginal contribution of incremental capacity. [REDACTED]

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[REDACTED]

[REDACTED] Another change that MISO is currently discussing in RASC is the move from a UCAP/ISAC based approach to a Direct Loss of Load (“DLOL”) approach. According to presentations by MISO, this DLOL approach would lower capacity accreditation for most types of resources for most seasons. [REDACTED]

[REDACTED]

[REDACTED]

Big Rivers has entered into a Solar power purchase agreement with Unbridled Solar, LLC for 160 MWs of solar energy. [REDACTED]

[REDACTED]

[REDACTED] Besides receiving the benefit of energy, we will also receive additional Capacity from this resource. As MISO transitions to modeling Capacity based on the highest risk hours and more solar units come online,

[REDACTED]

[REDACTED]

[REDACTED].

[REDACTED]

This is strongly dependent on resource performance during Tier 2 (high risk) hours. For PY24-25 and PY25-26, [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

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[REDACTED]

Q. Please discuss any actions taken by BREC to mitigate purchased power related costs for its customers.

A. As explained in Big Rivers’ response to Item No. 31 of the Commission Staff’s First Request for Information in Appendix B of the Commission’s September 6, 2023 Order, Big Rivers has a natural hedge on our portfolio as we own coal and natural gas resources and have a power purchase agreement with SEPA. These resources (subject to fuel procurement) are balanced against our on and off system load to determine if we are deficient power or have excess power. At that point, we monitor prices over the course of the year to find optimal price points to hedge and then take hedge positions that correspond to the limits mentioned in Big Rivers’ Board Policy 111 - Hedge Policy.

1 **Q. Discuss any planned outages that extended beyond the**
2 **estimated time of the outage and how BREC addressed the**
3 **extended outage, and any resulting capacity and energy**
4 **shortfalls.**

5 A. The majority of Big Rivers' planned maintenance outages during this
6 review period stayed within their scheduled window, but there were a
7 few that fell outside their window. The primary Outages that fell
8 outside their planning window were a Reid CT outage from January 3,
9 2022, to July 8, 2022, due to a bearing failure, and issues with Green #2
10 after its conversion from coal to gas. Green # 2 was out from May 1 to
11 May 16 and periodically in June. Reid CT is a peaking plant that does
12 not run consistently, except during high loads, so we did not buy
13 replacement capacity or energy and instead bought from the market.

14

15 **Q. Discuss whether BREC engaged in any off systems sales or**
16 **intersystem sales to offset high fuel or power costs during the**
17 **period under review.**

18 A. Big Rivers did engage in off system sales during the period under review
19 as we sold off excess power either bilaterally or directly to the MISO
20 market.

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1 **Q. Please describe how BREC bids its generating units into MISO**
2 **energy markets, including, but not limited to:**

3 **a. how BREC determines the manner in which individual**
4 **generating units are offered into MISO's day ahead**
5 **market (must run, economic dispatch etc.);**

6 **b. who makes those decisions; and**

7 **c. what level of control MISO has over the dispatch of Big**
8 **Rivers' generating units**

9 **A.**

10 a. Big Rivers offers its generating units into the MISO market each day
11 through the Generation Offer process. Big Rivers provides MISO with a
12 great deal of data on each unit's operating characteristics (availability,
13 minimum and maximum generation levels, ramp rate, start costs, etc.) and
14 a cost curve, which provides a formula for determining the variable operating
15 cost at various points within a unit's operating range. If a unit is available
16 (*i.e.*, not unavailable due to an outage), the default setting would be to set the
17 Commitment Status¹ on the Generation Offer to "Economic," to ensure
18 recovery of costs if MISO commits the unit.

19 For coal units expected to operate economically at a steady state for
20 long periods of time ("Baseload Units"), Big Rivers will frequently set the

¹ MISO Commitment Statuses include: Outage, Emergency, Economic, Must-Run, and Not Participating, as defined in the MISO Business Practice Manual.

1 Commitment Status to “Must Run.” “Must Run” status is used to minimize
2 starting and stopping the unit and associated increased maintenance
3 costs. Must Run status might also be used to minimize expensive starts, such
4 as when a unit is projected to generate economically on Friday and Monday,
5 but not on the intervening weekend or during any period when prices are
6 volatile and a stop and start is considered operationally problematic. Big
7 Rivers might also offer a unit as Must Run if a steady generation level is
8 needed for performance or environmental testing or to manage coal
9 inventories as units approach retirement. Big Rivers also offers Baseload
10 Units as “Must Run” if a long period of elevated Locational Marginal Prices
11 (“LMP’s”) is expected.

12 b. Big Rivers’ Chief Operating Officer Nathan Berry.

13 c. Generation qualifying as capacity for Resource Adequacy purposes
14 has a daily “must offer” requirement. Big Rivers must make its generation
15 available to MISO each day, and MISO may call upon that generation for
16 economic or reliability reasons. Big Rivers is free to impose operating
17 restrictions on the unit if it is unavailable or de-rated, but that will affect
18 the amount of capacity MISO accredits to that unit in the future. The
19 MISO Market Monitor will watch for restrictions that fall outside of
20 established guidelines and question them. Beyond that, MISO is free to
21 operate the unit consistent with the unit’s operating characteristics and
22 restrictions. MISO combines Big Rivers’ generation offers with those of all

1 other market participants and chooses the combination of assets that meets
2 load while minimizing cost and maintaining reliability.

3

4 **Q. Please discuss any cost/benefit analysis BREC has performed**
5 **regarding its participation in MISO.**

6 A. A cost/benefit analysis was performed by Charles River Associates in 2010.
7 It concluded that Big Rivers had no viable options for meeting its
8 Contingency Reserve requirement other than a stand-alone, self-supply
9 plan or by joining MISO.² The main benefit that we experience in the
10 MISO Market is not having to carry Operating Reserves. At this point in
11 time, we do not believe that it is cost feasible to build the additional
12 generators to carry these Operating Reserves. Another option is for Big
13 Rivers to join the PJM Market, but we are not interconnected with their
14 system. This option is not a viable alternative to participation in MISO at
15 this time.

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17 **Q. Does this conclude your testimony?**

18 A. Yes.

19

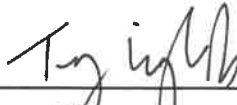
² See *In the Matter of: Application of Big Rivers Electric Corporation for Approval to Transfer Functional Control of its Transmission System to Midwest Independent Transmission System Operator, Inc.*, Case No. 2010-00043.

BIG RIVERS ELECTRIC CORPORATION

**AN ELECTRONIC EXAMINATION OF THE APPLICATION OF THE FUEL
ADJUSTMENT CLAUSE OF BIG RIVERS ELECTRIC CORPORATION
FROM NOVEMBER 1, 2020 THROUGH OCTOBER 31, 2022
CASE NO. 2023-00013**

VERIFICATION

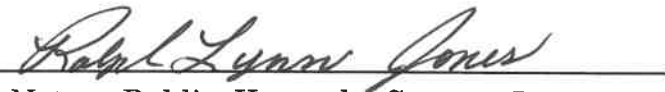
I, Terry Wright, Jr. verify, state, and affirm that I prepared or supervised the preparation of the Direct Testimony filed with this Verification, and that Direct Testimony is true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Terry Wright, Jr.

COMMONWEALTH OF KENTUCKY)
COUNTY OF DAVIESS)

21 SUBSCRIBED AND SWORN TO before me by Terry Wright, Jr. on this the
day of September, 2023.



Notary Public, Kentucky State at Large
Kentucky ID Number KYNP43026
My Commission Expires 1-14-2026