COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

ELECTRONIC TARIFF FILING OF	**)**	
BIG RIVERS ELECTRIC CORPORATION	**)**	**Case No.**
AND KENERGY CORP. TO IMPLEMENT	**)**	**2021-00289**
A NEW STANDBY SERVICE TARIFF	**)**	

Big Rivers Electric Corporation
and Kenergy Corp.

Joint Responses to Kimberly-Clark Corporation's
First Set of Data Requests
dated

August 20, 2021

FILED: September 3, 2021

BIG RIVERS ELECTRIC CORPORATION

ELECTRONIC TARIFF FILING OF
BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.
TO IMPLEMENT A NEW STANDBY SERVICE TARIFF
CASE NO. 2021-00289

VERIFICATION

I, John Wolfram, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

John Wolfram

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by John Wolfram on this the 1st day of September, 2021.

Notary Public, Kentucky State at Large

My Commission Expires _____

Notary Public, Kentucky State-At-Large
My Commission Expires: July 10, 2022
ID: 604480

BIG RIVERS ELECTRIC CORPORATION

ELECTRONIC TARIFF FILING OF
BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.
TO IMPLEMENT A NEW STANDBY SERVICE TARIFF
CASE NO. 2021-00289

VERIFICATION

I, Mark J. Eacret, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Mark J. Eacret

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

1st SUBSCRIBED AND SWORN TO before me by Mark J. Eacret on this the _____ day of September, 2021.

Joy P. Parsley
Notary Public, Kentucky State at Large

My Commission Expires _____

Notary Public, Kentucky State-At-Large
My Commission Expires: July 10, 2022
ID: 604480

BIG RIVERS ELECTRIC CORPORATION
KENERGY CORP.

ELECTRONIC TARIFF FILING OF
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Joint Response to Kimberly-Clark Corporation's
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dated August 20, 2021

September 3, 2021

Item 1) ***Refer to the Direct Testimony of John Wolfram, pp.3-4. "The credit is based on the value of capacity described by Big Rivers in its recent filing regarding the conversion of the Green Station units to natural gas in Case No. 2021-00079. See In the Matter of: Electronic Application Of Big Rivers Electric Corporation For A Certificate Of Public Convenience And Necessity Authorizing The Conversion Of The Green Station Units To Natural Gas Fired Units And An Order Approving The Establishment Of A Regulatory Asset, filed February 28, 2021. In that filing, Big Rivers describes the capacity price projections in the Direct Testimony of Mark Eacret on pages 9-12 and in Eacret Exhibit 3."***

a. Please provide an unredacted copy of Mark Eacret's referenced testimony, including Exhibit 3.

b. Does BREC believe that the cost to convert the Green Station units to natural gas represents BREC's marginal cost of capacity?

i. Please explain why or why not.

c. What is BREC's embedded cost of generation capacity?

i. Please provide all supporting workpapers, in Excel format with working formulas.

d. What is BREC's embedded cost of transmission capacity?

i. Please provide all supporting workpapers, in Excel format with working formulas.

Response)

a. Please see the referenced testimony and exhibit provided with this response ("*Attachment 1*").

b. Yes.

i. From a resource planning standpoint, the conversion of the Green Station units to natural gas effectively serves as Big Rivers' next

resource acquisition. Analysis more fully described in Case No. 2021-00079 indicated that the cost per kw/month of the Green conversion was very similar to the bilateral market cost of capacity over the same period, confirming the reasonableness of that approach for procuring the next required MW. The capacity cost of the converted Green Station units is the capacity cost Big Rivers incurs to meet incremental demand, and therefore represents the marginal cost of capacity.

c. Big Rivers assessed the embedded cost of capacity in its recent filing of two cost of service studies in Case No. 2021-00061. Using the preferred study (using 12 CP allocation instead of Average & Excess for production demand), the embedded costs of generation and transmission capacity are provided in the attachment ("*Attachment 2*") provided with this response.

i. Please see the confidential Excel spreadsheet file ("*Attachment 3*") provided with these responses.

d. Please see the above response to subpart c.

1 **Witness)** John Wolfram

III. PRICE PROJECTIONS USED IN BIG RIVERS' ANALYSIS

Q. How were the capacity price projections used in the modeling developed to determine the best option for addressing Big Rivers' capacity shortage?

A. To determine bilateral market prices, Big Rivers solicited over twenty market participants for long-term capacity proposals. Eleven of the market participants responded with no offers. Four market participants provided offers for year 2022 only. The remaining participants offered five to ten years in the range of [redacted] per kw/month. There were only two long-term offers in MISO Zone 6, where Big Rivers load, and hence capacity obligation, is located. The other long term offers were in MISO Zone 4 and include basis risk. When reviewing the offers, Big Rivers evaluated not only the price and MISO zone, but other considerations including the counterparties' credit ratings. See Eacret Exhibit 3 for a list of the offers and a capacity forward curve based upon them.

Q. Could Big Rivers simply purchase the capacity in the annual MISO Planning Resource Auction (PRA)?

A. The MISO PRA is held in the spring of each year and participants can only purchase capacity for the following planning year, which begins on June 1. This approach would limit our ability to hedge to one year at a time and the

price for a planning year would not be known until the prior spring. This creates a large capacity price risk.

For instance, in the PRA for the 2019 Planning Year, the Auction Clearing Price for MISO Zone 7 was $24.30/MW-Day. That equates to about $.74/kw-month. For the following Planning Year, the Zone 7 ACP was $257.53/MW-Day, or about $7.83/kw-month (ten times higher). A market participant who chose to purchase 300 MW in each PRA would have paid $2,660,850 in 2019 and $28,199,535 in 2020.

While that is an extreme example of volatility, it is certainly possible. Furthermore, the retirement of a large number of baseload units in MISO Zone 6 will put pressure on the balance of supply and demand. Big Rivers needs a longer-term hedging alternative, such as a multi-year capacity purchase. See Exhibit Eacret-4 for historical Planning Resource Auction Clearing Prices.

Q. How have MISO capacity market price projections changed from those submitted in Table 8.6 of Big Rivers 2020 IRP?

A. The method used to develop the projections were the same as in the 2020 IRP. Any differences are due to updated forecasts.

Q. How did Big Rivers develop the forecasted natural gas prices used in the economic analysis of the proposed project?

A. Spot Henry Hub natural gas price forecasts were provided from a third party, ACES. The table attached hereto as Exhibit Eacret-5 displays the projected monthly spot prices for January 2023 through December 2029 that were used in the evaluation. The non firm gas supply has a [redacted] delivery cost that is added to spot price.

The forecasted firm gas demand charge used in the economic analysis was provided by vendor estimate and is modeled at [redacted], where the MMBtu amount is the volume of natural gas to be firm. The model assumes the full load of Green Station natural gas units after the conversion as the volume of firm natural gas.

Q. How have these natural gas price projections changed from those submitted in Big Rivers' 2020 IRP, including in Figure 8.4?

A. The method used to develop the projections were the same as in the 2020 IRP. Any differences are due to updated forecasts and the variance between the two forecasts are shown in Exhibit Eacret-5.

Q. How did Big Rivers develop the other forecasts relied upon in its evaluation of the best option to satisfy its projected capacity shortfall?

A. The 2020 IRP did not include OMU and KyMEA as a load obligation and looked at a twenty-year horizon (2024-2043). The Green Station evaluated the capacity requirements of the Member and non-Member contracts and used a seven year horizon (2023-2029). The other forecasts and cost estimates relied upon were developed in the same as those utilized in Big Rivers' 2020 IRP. Please see the IRP for the full explanation of how they were developed.

Big Rivers Electric Corporation
Capacity Forward Curve

ECP Forward Curve Updated with Market Survey Information in late 2020									
Planning Year	PY 22/23	PY 23/24	PY 24/25	PY 25/26	PY 26/27	PY 27/28	PY 28/29	PY 29/30	PY 30/31
MISO Zone 6 ZRC, $/kW-mo	[redacted]								

BIG RIVERS ELECTRIC CORPORATION
Cost of Service Study
Class Allocation
12 Months Ended December 31, 2019
-- OPTION 1 --

	Description	Name	Allocation Vector	Total System	Rural Delivery Service RDS	Large Industrial Customer LIC
	Big Rivers Electric Corporation					
	2019 Cost of Service Study - Option 1 (12 CP)					
	Embedded Cost Calculations					
1	**Production**					
2	Production Rev Req			$ 105,620,296	$ 81,744,462	$ 23,875,833
3	12 CP Demand			6,775,662	5,244,000	1,531,662
4	Cost per Unit 12 CP ($/kW)	Gross		15.5882	15.5882	15.5882
5	Off System Sales Revenue - Production Demand-Related			$ 6,927,131	$ 4,883,705	$ 2,043,426
6	Net Production Rate Rev Req			$ 98,693,165	$ 76,860,758	$ 21,832,407
7	Cost per Unit 12 CP ($/kW)	Net		14.5658	14.6569	14.2541
8						
9						
10	**Transmission**					
11	Transmission Rev Req			$ 54,986,760	$ 42,556,813	$ 12,429,947
12	12 CP Demand			6,775,662	5,244,000	1,531,662
13	Cost per Unit 12 CP ($/kW)	Gross		8.1153	8.1153	8.1153
14	Transmission Service Revenue (unrelated to RDS & LIC)			$ 14,882,739	$ 11,518,445	$ 3,364,295
15	Net Transmission Rate Rev Req			$ 40,104,021	$ 31,038,368	$ 9,065,653
16	Cost per Unit 12 CP ($/kW)	Net		5.9188	5.9188	5.9188
17						
18	Transmission Revenue					
19	HMPL Joint Pricing Zone			$ (1,568,113)		
20	Century Sebree			$ 7,664,958		
21	Century Hawesville			$ 8,785,894		
22				$ 14,882,739		

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Item 2) ***Refer to Docket No. 2021-00061 Electronic Application Of Big Rivers Electric Corporation For Review Of Its MRSM Charge For Calendar Year 2020, Application, p. 10. "In further compliance with the Commission's June 25, 2020, Order in Case No. 2020-00064, Big Rivers gives notice of filing two fully—allocated cost of service studies based upon the NARUC-approved methods."***

a. Please provide the referenced cost of service studies, in Excel format with working formula.

b. Please indicate whether BREC has any updates to its cost of service studies that should be recognized in this proceeding. If BREC has updates, please provide a copy of the updated cost of service study, in Excel format with working formula.

c. According to BREC's cost of service studies, what is the embedded unit cost of generation capacity for Large Industrial Customers?

i. Please explain in detail how the unit cost is derived from the cost of service study and provide all supporting workpapers and

calculations, in Excel format with working formula where applicable.

d. According to BREC's cost of service studies, what is the embedded unit cost of transmission capacity for Large Industrial Customers?

i. Please explain in detail how the unit cost is derived from the cost of service study and provide all supporting workpapers and calculations, in Excel format with working formula where applicable.

e. Are loads from the planned Nucor facility is Bradenburg, Meade County, Kentucky, incorporated into BREC's cost of service studies?

i. If yes, please explain how.

f. The Sebree smelter and the Hawesville smelter departed BREC's system resulting in an approximate loss of 850 MW of native load. Does BREC currently provide transmission service to the smelters?

i. If yes, please explain how the transmission service costs to serve the smelters is reflected in BREC's cost of service studies.

Response)

a. Please see the attached confidential electronic file provided with this response.

b. Big Rivers has not updated the cost of service studies that were filed in Case No. 2020-00061.

c. Using the preferred study (using 12 CP allocation instead of Average & Excess for production demand), the embedded costs of generation and transmission capacity for the Large Industrial Customers ("LIC") rate class are provided in the attachment to Big Rivers' response to Item 1c. and Item 1d. of Kimberly-Clark's First Data Requests. The unbundled per-unit values were not explicitly calculated in the originally filed study because generation and transmission demand charges are bundled in Big Rivers' tariffs, but the derivation of the desired values shown in the attachment, using data included in the study, is appended to the "Class Allocation-Option 1" worksheet.

i. To determine the embedded generation capacity cost for the LIC class, the revenue requirement for production demand is reduced by the demand-related portion of off-system sales revenues. That net revenue requirement is then divided by the LIC demand in kW.

d. Please see Big Rivers' response to subpart c.

i. To determine the embedded transmission capacity cost for the LIC class, the revenue requirement for transmission demand is reduced by the transmission-related revenues from the smelters (described in Big Rivers' response to sub-part f). That net revenue requirement is then divided by the LIC demand in kW.

e. No.

i. Not applicable.

f. No, transmission service to the smelters is provided by MISO. MISO invoices a third-party energy manager operating as market participant on behalf of the smelters. Big Rivers, as the transmission owner, receives some of that revenue from MISO.

i. Transmission service revenue is recorded in Account 456, Other Electric Revenue. This is reflected in the cost of service study in the Class Allocation worksheet (Excel tab "Alloc-Opt1"), page 4 of 9, in the Operating Revenues section.

Witness) John Wolfram

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Item 3) ***What planning reserve margin does BREC plan for to meet its peak demand requirements?***

Response) As a transmission-owning member of MISO,[1] Big Rivers plans to meet MISO's annual planning reserve margin requirements indicated in Planning Resource Auction ("PRA") Document "Loss of Load Expectation ("LOLE") Study Reports" located on MISO website: https://www.misoenergy.org/planning/resource-adequacy/#t=10&p=0&s=FileName&sd=desc .

Witness) Mark J. Eacret

[1] Midcontinent Independent System Operator, Inc.

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Item 4) ***Please provide 8760 hourly load data for BREC's members for the most recent annual time period over which BREC has the requested data available. Please provide the data in Excel format.***

Response) Please see the Excel spreadsheet file provided with these responses.

Witness) Mark J. Eacret

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Item 5) ***Please provide 8760 hourly generation data for each of BREC's generation resources for the most recent annual time period over which BREC has the requested data available. Please provide the data in Excel format.***

Response) Please see the Excel spreadsheet file provided with these responses.

Witness) Mark J. Eacret