

ORIGINAL



Your Touchstone Energy® Cooperative 

RECEIVED

OCT 15 2014

**PUBLIC SERVICE
COMMISSION**

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

**BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN**

)
) **Case No.**
) **2014-00166**

**Response to Ben Taylor and the Sierra Club's
Supplemental Request for Information
dated September 26, 2014**

FILED: October 15, 2014

ORIGINAL

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 1) Refer to Big Rivers' response to KIUC 2-32, which is referenced in your**
2 **response to SC 1-1(a), (b), and (g).**

3 **a. Explain the "informed judgment" upon which the forecasted**
4 **replacement load included in the IRP is based**

5 **b. Identify and produce all studies, analyses, or other documents upon**
6 **which that "informed judgment" is based.**

7 **c. Detail the "information available . . . at the time" upon which Big Rivers '**
8 **management determined that its replacement load forecast was a "reasonable**
9 **expectation."**

10

11 **Response)**

12 **a) Big Rivers' management team has extensive knowledge of the power industry**
13 **and has decades of combined experience. The management team relies on a combination of**
14 **past experience, trade publications, meeting and conferences with other utilities, and news**
15 **reports, among many other sources of information.**

16 **b) See response to subpart a, above.**

17 **c) See response to subpart a, above.**

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 2)** Refer to Big Rivers' response to SC 1-l(g). Explain why Big Rivers'
2 **historical load factor is "irrelevant to future replacement load."**

3

4 **Response)** Big Rivers' future replacement load is expected to consist of a larger
5 percentage of market transactions than typical of its historical native load factor. The types
6 of market transactions implemented will significantly impact the load factor of replacement
7 load, rendering Big Rivers' native load historical load factor irrelevant to the calculation of
8 an estimated load factor for total replacement load.

9

10 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 3) Refer to Big Rivers' response to PSC 1-9, which is referenced in your**
2 **response to SC 1-2.**

3 **a. Explain the basis for your contention that Big Rivers' projection of an**
4 **approximately 800% increase in replacement load between 2016 and 2021 is "realistic,**
5 **but conservative."**

6 **b. Explain the basis for your contention that "[t]he power market was**
7 **projected to begin increasing in 2016," and:**

8 **i. Identify who made such projection**

9 **ii. Identify the assumptions upon which that projection was based**

10 **iii. Produce all studies, analyses, or other documents supporting such**
11 **projection.**

12

13 **Response)**

14 **a. Please see Big Rivers' response to PSC 2-3.**

15 **b. Please see Big Rivers' response to SC 2-1.**

16

17 **Witness) Lindsay N. Barron**

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 4)** Refer to Big Rivers' response to SC 1-3(c). Identify the basis for your
2 contention that the assumption regarding holding industrial sales constant in the
3 forecast "has thus far proved accurate," and produce any documents supporting that
4 contention.

5

6 **Response)** Big Rivers has not seen the closure of any industrial facilities driven by the
7 proposed rate increases, but has instead seen expansion. Aleris recently announced a \$350
8 million expansion at its Lewisport facility.

9

10 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 5) Refer to the Summary of Nebraska PPAs produced as an Attachment to**
2 **Big Rivers' response to SC 1-7(a).**

3 **a. Explain the basis for the estimated "average aggregate quantities" to be**
4 **supplied that are identified in the last paragraph on page 1 of the Summary, and how**
5 **those quantities were calculated**

6 **b. Produce the Big Rivers analysis of estimated rates to be paid by the**
7 **Nebraska entities identified in the last paragraph on page 3 of the Summary, and any**
8 **documentation or workpapers for such analysis.**

9 **i. If such analysis does not exist in written form, describe the**
10 **analysis and its results in detail.**

11 **c. Produce the ACES analysis of NPPD's projected rates identified in the**
12 **last paragraph on page 3 of the Summary, and any documentation or workpapers for**
13 **such analysis.**

14 **i. If such analysis does not exist in written form, describe the**
15 **analysis and its results in detail.**

16 **d. Produce the Big Rivers "analyses of the cost-effectiveness of this sale"**
17 **identified in the last paragraph on page 3 of the Summary, and any documentation or**
18 **workpapers for such analysis.**

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 i. **If such analyses do not exist in written form, describe the analyses**
2 **and their results in detail.**

3
4 **Response)** Big Rivers objects that this request is overly broad and not reasonably
5 calculated to lead to the discovery of admissible evidence. Notwithstanding these objections,
6 and without waiving them, Big Rivers states as follows.

7 a. The quantities were estimated based on the actual historic load of the
8 Nebraska entities and were calculated assuming Big Rivers would gain the loads as outlined
9 in the transition phase projected at the bottom of page 1 of the Summary.

10 b. Please see attached CONFIDENTIAL document, which is being provided
11 subject to a petition for confidential treatment.

12 c. Please see the attached CONFIDENTIAL document, which is being provided
13 subject to a petition for confidential treatment.

14 d. Please see the attached CONFIDENTIAL paper and electronic files, which are
15 being provided subject to a petition for confidential treatment and (with respect to the
16 electronic file) a motion for deviation.

17
18 **Witness)** Lindsay N. Barron

Big Rivers Electric Corporation

Case No. 2014-00166

NPPD Forecasted Pricing

	Increases		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
	LF	2013													
SSC		52.34													
Wayne		53.98													
Wakef		50.55													
NENPPD		49.38													

Annual Load



Big Rivers Forecasted Pricing

	Increases		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
	LF	2013													
SSC		52.34													
Wayne		53.98													
Wakef		50.55													
NENPPD		49.38													

In the Matter of:

2014 INTEGRATED RESOURCE PLAN)
OF BIG RIVERS ELECTRIC CORPORATION) **Case No. 2014-00166**

CONFIDENTIAL ATTACHMENTS IN RESPONSE
to Item 5(c) and Item 5(d) of
Ben Taylor and Sierra Club's
Supplemental Request for Information
dated September 26, 2014
FILED: October 15, 2014

INFORMATION SUBMITTED UNDER PETITION FOR CONFIDENTIAL
TREATMENT

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 6)** **Refer to Big Rivers' response to AG 1-13, which is referenced in your**
2 **response to SC 1-9.**

3 **a. Identify each of the "more than 10 RFPs since January 2014" that Big**
4 **Rivers has responded to.**

5 **b. For each such RFP, identify:**

6 **i. The amount of capacity and/or energy requested or proposed in**
7 **the RFP**

8 **ii. The timeframe for which such capacity and/or energy was sought**
9 **in the RFP**

10 **iii. The price for energy and/or capacity offered by Big Rivers in**
11 **response to the RFP**

12 **iv. The status of Big Rivers' response to the RFP.**

13 **c. Identify each entity that Big Rivers has "spent significant amount of time**
14 **working with"**

15 **d. For each such entity, identify:**

16 **i. The amount of capacity and/or energy at issue in Big Rivers' work**
17 **with such entity**

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

- 1 ii. **The timeframe for which such capacity and/or energy is being**
2 **proposed**
- 3 iii. **The price for energy and/or capacity being offered by Big Rivers**
4 iv. **The status of Big Rivers ' work with such entity**
5 v. **Any capacity and/or energy purchase that has been entered into**
6 **by the entity and Big Rivers**

7

8 **Response)** Big Rivers objects to this question on the grounds that it is overly broad,
9 unduly burdensome, and not reasonably calculated to lead to the discovery of admissible
10 evidence. Notwithstanding that objection, and without waiving it, Big Rivers states that it
11 expects that its Mitigation Plan will be fully evaluated in the Focused Management Audit
12 ordered by the Commission in Case No. 2013-00199.

13

14 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 7) Refer to Big Rivers' response to AG 1-19.**

2 **a. Explain the basis for your contention that, over the long term, the**
3 **increase in electric prices will be equal to inflation.**

4 **b. Produce any studies, analyses, or other documents supporting the**
5 **contention that, over the long term, the increase in electric prices will be equal to**
6 **inflation.**

7

8 **Response)**

9 **a. Historically, the average increase in retail prices for Big Rivers' member**
10 **cooperatives has not exceeded the average rate of inflation as measured by the GDP Deflator.**
11 **Over the long term, and beyond the increase in retail rates resulting from the recent**
12 **wholesale price increases, Big Rivers has not projected additional wholesale price increases.**
13 **Increases in the price of electricity due to factors other than wholesale costs are expected to**
14 **be relatively low and similar to historical changes, which have been similar to the rate of**
15 **inflation.**

16 **b. The Energy Information Administration ("EIA") publishes retail fuel price**
17 **projections in its Annual Energy Outlook. EIA's current retail price projections for the East**
18 **South Central Census Region, by fuel type, are provided in the electronic attachment**

Case No. 2014-00166
Response to SC 2-7

Witnesses: Marlene S. Parsley and John W. Hutts, GDS
Page 1 of 2

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 (provided subject to a motion for deviation) to this response. Refer to "Expenditure" rows
2 (top portion of the report), which present prices in deflated, or real terms (2012 dollars). For
3 years 2013-2028, EIA projects the deflated price of electricity to be essentially flat, which is
4 to say that nominal price is projected to increase at rates very close to inflation.

5

6 **Witnesses)** Marlene S. Parsley and John W. Hutts, GDS

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 8) Refer to Big Rivers' response to SC 1-21(d) and (e).**

2 **a. Confirm whether the cost of installing ACI and DSI on the Coleman**
3 **Station is included in the IRP Base Case.**

4 **i. If not, explain why not.**

5 **b. Identify the estimated variable operating cost, in \$/MWh, of operating**
6 **DSI on the Wilson Station.**

7

8 **Response)**

9 a. The IRP base case assumed all generating units were in operation. The
10 projected O&M costs of the Coleman MATS were included in the variable O&M costs in the
11 base case. The capital costs for Coleman MATS were included as part of Environmental
12 Case 1, but not the IRP base case.

13 i. The capital costs were not included in the IRP base case because they
14 should not have a material impact on any production cost model
15 outputs or study results, as the dispatch of the units is primarily
16 determined by variable O&M costs.

17 b. The estimated variable operating cost for DSI on Wilson Station in 2014 is

18 [REDACTED].

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1

2 **Witness)** Eric M. Robeson

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 9) Refer to Big Rivers' response to SC 1-23**

2 **a. State whether Big River has analyzed or estimated its projected carbon**
3 **emissions beyond 2019.**

4 **i. If so, produce such analysis or estimate.**

5 **ii. If not, explain why not.**

6 **b. State whether Big Rivers has analyzed or evaluated its potential options**
7 **for complying with the carbon standards proposed in the U.S. EPA's Clean Power Plan**
8 **released in draft form on June 2, 2014.**

9 **i. If so**

10 **(1) Explain the results of such analysis or evaluation**

11 **(2) Produce any documentation of such analysis or evaluation**

12 **ii. If not, explain why not**

13 **c. State whether Big Rivers has evaluated any of the following as options for**
14 **reducing carbon emissions and/or complying with potential future carbon regulations:**

15 **i. Coal unit efficiency upgrades**

16 **ii. Coal unit retirements**

17 **iii. Purchase of renewable energy**

18 **iv. Construction or acquisition of renewable energy capacity**

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

- 1 v. **Purchase of renewable energy credits**
- 2 vi. **Purchase of carbon offsets**
- 3 vii. **Increased demand side management, including energy efficiency**
- 4 **and/or demand response**

5 d. **If the answer to any of the subparts in subsection c is "yes," explain the**

6 **results of such analysis and produce any documentation.**

7 e. **If the answer to any of the subparts in subsection c is "no," explain why**

8 **not.**

9

10 **Response)**

11 a. Please see the response and attachments to AG 1-7, which display the

12 estimated CO2 emissions under two possible operating scenarios (Coleman idled or All

13 running).

14 b. Big Rivers has established a greenhouse gas team to examine the implications

15 of the proposed Clean Power Plan, and there have been some preliminary meetings regarding

16 this topic. Big Rivers has not yet analyzed or evaluated specific compliance options at this

17 time.

18 c. See the response to subpart b, above.

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

- 1 d. Not applicable.
- 2 e. See the response to subpart b, above.
- 3
- 4 **Witness)** Eric M. Robeson

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 10) Refer to Big Rivers' response to SC 1-25(b).**

2 **a. Explain the differences between the three PCM model runs referenced**
3 **therein.**

4 **b. Explain how the results of the PCM model runs referenced therein differ**
5 **from the results of PCM model runs in which the Green units continue to operate on**
6 **coal.**

7 **c. Based on these PCM model runs and any other analyses performed by**
8 **the Company, identify your current projection of the net present value revenue**
9 **requirement, or other measure of the cost impact, of converting the Green units to**
10 **natural gas versus continuing to operate those units on coal?**

11 **d. Explain any other conclusions about the Green units which Big Rivers**
12 **has drawn from the PCM model runs referenced therein.**

13

14 **Response)**

15 **a. There are no differences in the inputs for the Green Units to the three PCM**
16 **model runs, as each PCM model run had both Green Units on natural gas beginning in 2015.**
17 **The differences in the three PCM model runs involved the operating status of the Coleman**
18 **and Wilson Stations. BREC PCM AllRun GNGas.xlsx had Wilson and Coleman operating**

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 for the entire time period. BREC PCM WLCL back GNGas.xlsx had Wilson idled from
2 January, 2014 thru May, 2018 and Coleman idled from February, 2014 thru July, 2019.
3 BREC PCM WLCL Idle GNGas.xlsx had Wilson and Coleman idled for the entire period.

4 b. There are several changes to the PCM model inputs for the Green Units on
5 natural gas versus on coal.

- 6 • Fuel costs and non-fuel VOM costs are updated. Big Rivers utilized the
7 Henry Hub natural gas price forecasts provided by ACES plus a delivery
8 charge for the fuel cost and forecasted the non-fuel VOM costs to be ■ while
9 burning natural gas.
- 10 • The emission rates for NOx and SO2 were adjusted. The NOx emission rate
11 was raised to 0.300 lbs/MMBTU, and the SO2 emission rate was lowered to
12 0.06 lbs/MMBTU while burning natural gas.
- 13 • The Equivalent Unplanned Outage Rate (EUOR) was lowered by 1% due to
14 operating less equipment while burning natural gas.
- 15 • The net capacity on each unit was raised by 9 MW due to lower auxiliary
16 power usage while burning natural gas.
- 17 • The heat rate curve was raised by ■ while burning natural gas.

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 c. The PCM model runs only calculate the variable cost impact of the fuel switch
2 to natural gas. The fixed cost impact will need to be evaluated before the measure of cost
3 impact can be determined. As stated in Big Rivers' response to SC 1-25(c), the estimated
4 schedule for completing such evaluations has not been determined.

5 d. Please see response to subpart c, above.

6

7 **Witness)** Duane E. Braunecker

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 11)** **Refer to Table 10.3 on page 109 of the IRP and your response to SC 1-26.**

2 **a.** **State whether Big Rivers assigned probabilities to each or any of the 17**
3 **sensitivity analyses that it carried out.**

4 **i.** **If so, identify the probability assigned to each sensitivity**

5 **ii.** **If not, explain why not.**

6

7 **Response)**

8 **a.** The cases studied were developed to present a full range of feasible
9 possibilities over the 15 year period of study, rather than assign a likelihood of any one
10 possibility. Therefore, Big Rivers did not assign probabilities to the sensitivity analyses
11 included in the development of this IRP.

12

13 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 12) Refer to pages 103 to 106 of the IRP. With regards to the base case and 17**
2 **sensitivity cases that you modeled in Strategist:**

3 **a. State whether retirement of any Big Rivers generating unit was allowed**
4 **to be considered by the Strategist model**

5 **i. If so, identify in which cases such option was allowed to be**
6 **considered;**

7 **ii. If not, explain why not.**

8 **b. State whether additional demand side management beyond the DSM**
9 **programs included in the \$1 million annual energy efficiency expenditure case was**
10 **allowed to be considered by the Strategist model**

11 **i. If so, identify in which cases such option was allowed to be**
12 **considered;**

13 **ii. If not, explain why not.**

14

15 **Response)**

16 **a. Retirement of units was not analyzed during the modeling process because**
17 **existing generating units continue to be valuable assets that provide reliability, maintain Big**
18 **Rivers' access to capital markets, and provide protection for Big Rivers' Members against**

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 inevitable fluctuations in energy and capacity markets. Big Rivers determined it prudent to
2 allow the energy market to evolve in the short term before making a decision about
3 permanent early retirement of any units.

4 b. No additional DSM programs beyond the programs included in the \$1 million
5 energy efficiency expenditure were included in the Strategist Model. The \$1 million spend
6 was modeled in the base case and was included in all Strategist runs. The \$1 million was
7 used because that is what has been approved by the KPSC as cost-effective and reasonable,
8 and it is the amount included in the calculation of Big Rivers' rates. The DSM potential
9 study evaluates the potential effects of the \$2 million scenario over a 10 year period, so it
10 was unnecessary to re-evaluate the impact of that scenario using a Strategist run.

11

12 **Witnesses)** Marlene S. Parsley and Russell L. Pogue

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 13) Refer to Big Rivers' response to SC 1-28.**

2 **a. For each of Big Rivers' coal-fired generating units, identify the types of**
3 **coal, and the percentage of the total for each type of coal, that you plan to burn in each**
4 **of the years of the IRP.**

5 **b. Identify which of the coal price projections included in the spreadsheet**
6 **you produced as an attachment to your response to SC 1-28 you used to "determine an**
7 **annual percent increase to calculate years 2018 through 2028."**

8
9 **Response)**

10 a. Please review pages 2-3 to SC 1-28, Attachment 2. Each unit at a specific
11 generating station has the same fuel box; therefore, fuel is forecasted by generating station.
12 All stations burn bituminous coal, primarily Illinois Basin, high sulfur coal. Please see
13 below:

- 14 • Wilson Station (2014 to 2028): ILB, [REDACTED], high sulfur – 100%
- 15 • Green Station (2014 to 2028): ILB, [REDACTED], high sulfur – 100%
- 16 • Coleman Station (2014 to 2028): ILB, [REDACTED], high sulfur – 100%
- 17 • HMP'L Station (2014 to 2028): ILB, [REDACTED], high sulfur – 100%

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166


Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 Please note Wilson Station and Green Station are capable of burning a small
2 percentage of petroleum coke. Big Rivers will continue to utilize petroleum coke if it is
3 available and provides a benefit to Big Rivers and its Members.

4 b. Please review page 1 to SC 1-28, Attachment 1. The second footnote states,

5 

6  The JDE long term forecasts were provided on the
7 Confidential Electronic Attachment contained in the folder labeled, "SC 1-28."

8

9 **Witness)** Duane E. Braunecker

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

**Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014**

October 15, 2014

1 **Item 14)** Refer to Big Rivers' response to SC 1-31 (b).

2 a. State whether the Wood Mackenzie long term outlook equilibrium prices
3 forecast incorporates a cost for the regulation of carbon emissions.

4 i. If so, identify the assumed carbon price for each of year of the
5 forecast.

6
7 **Response)** Wood Mackenzie assumed a federal carbon price is applied to power sector
8 emissions beginning in [REDACTED] at [REDACTED] per metric-ton and escalating at [REDACTED] percent annually,
9 thereafter (all real 2013 dollars).

10

11 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 15)** Refer to Big Rivers' response to SC 1-33.

2 a. Identify the date of Big Rivers' most recent long-term financial forecast
3 that goes through at least the year 2026, and produce such forecast.

4 b. Explain why Big Rivers' most recent long-term financial forecast is
5 available only through the year 2017.

6 c. Identify the date of the most recent Big Rivers long-term financial
7 forecast that goes beyond the year 2017, and produce such forecast.

8
9 **Response)**

10 a. The most recent long-term financial forecast that goes through at least the year
11 2026 is named *Financial Forecast (2014-2028) 9-15-2014.xlsx* and is provided on the
12 CONFIDENTIAL electronic media produced in response to AG 2-2.

13 b. Please see response to subpart a, above.

14 c. Please see response to subpart a, above.

15

16 **Witness)** Christopher A. Warren

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 16) Refer to Big Rivers' response to SC 1-37.**

2 **a. Explain how Big Rivers decided to model in its DSM Potential Study a \$2**
3 **million per year DSM incentives budget.**

4 **b. Prior to modeling the \$2 million DSM incentives budget scenario, was the**
5 **scenario determined to be technically feasible?**

6 **i. If yes, please explain why Big Rivers is choosing to not pursue a**
7 **plan that is both technically feasible and provides greater benefits**
8 **to ratepayers.**

9 **ii. If no,**

10 **(1) Explain why the plan was determined to be technically**
11 **infeasible and provide any supporting documents in**
12 **machine readable format with formulas intact.**

13 **(2) Explain why Big Rivers chose to perform modeling of**
14 **technically infeasible plans.**

15 **c. Explain how the annual incentive budget amounts identified in the**
16 **Attachment to your response to SC 1-37 were derived, and produce any modeling files,**
17 **workpapers, or other documents used to derive those amounts.**

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Response)**

2 a. Big Rivers directed GDS to model a second scenario which assumes a \$2
3 million incentive budget to evaluate the potential savings at a spending level double the
4 current Big Rivers incentive budget of \$1 million.

5 b. Yes. The \$2 million DSM incentives budget scenario is technically feasible.
6 The scenario is a subset of Achievable Potential, which in turn is subset of Economic and
7 Technical Potential. All potential that is part of the Technical Potential is technically feasible.

8 i. Please see the response to PSC 1-18.

9 ii. Not applicable.

10 c. The annual incentive budget amounts were determined by multiplying the
11 achievable potential number of participants times the incentive amount for each measure
12 each year. The accompanying Excel file, provided subject to a motion for deviation, shows
13 how the participants times the incentive percentage times the incremental cost (incentive
14 percentage times incremental cost equals incentive amount) yields the total cost for each
15 measure. The totals for each measure can then be summed up to equal the annual incentive
16 amounts provided in response to SC 1-37. The "Res" tab provides the residential sector data.
17 The "C&I" tab provides the commercial and industrial sector data.

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Witnesses)** Russell L. Pogue and Warren E. Hirons, GDS

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 17) Refer to Big Rivers' response to SC 1-42**

2 **a. Please provide a correlation matrix showing the correlation between each**
3 **pair of the following list of variables: coal price, natural gas price, carbon price,**
4 **demand, and energy market price.**

5 **b. Please provide all documents and analyses used to develop the correlation**
6 **matrix.**

7 **c. For each of the high and low carbon cost cases, identify what level of**
8 **variation from the base case load forecast was assumed, explain the basis for that**
9 **assumption, and produce all analyses and documents supporting such assumption.**

10 **d. For each of the high and low carbon cost cases, identify what level of**
11 **variation from the base case energy forecast was assumed, explain the basis for that**
12 **assumption, and produce all analyses and documents supporting such assumption.**

13 **e. For each of the high and low carbon cost cases, identify what level of**
14 **premium was placed on market energy prices, explain the basis for that level of**
15 **premium, and produce all analyses and documents supporting such level of premium.**

16

17

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Response)**

2 a. Big Rivers objects to this question on the grounds that it is overly broad,
3 unduly burdensome and not reasonably calculated to lead to the discovery of admissible
4 evidence. Notwithstanding this objection, and without waiving it, Big Rivers states that no
5 such correlation matrix exists.

6 b. See response to subpart a, above.

7 c. For the high and low carbon costs cases, variation from the base case load
8 forecast was computed rather than assumed. Variations from the base case forecast are
9 summarized in Table 4.22 of the IRP report. Variations from the base case forecast for each
10 year can be computed down to the hourly level using the data contained in the following
11 files, which were provided in response to AG 1-17:

12 LOAD FORECAST_NO DSM_BASE CASE_03-12-14.XLSX

13 LOAD FORECAST_NO DSM_CARBOIN TAX HIGH_03-12-14.XLSX

14 LOAD FORECAST_NO DSM_CARBOIN TAX LOW_03-12-14.XLSX

15 The high carbon costs load forecast scenario reflects a fee of \$30 per metric ton of
16 CO₂ beginning in 2020 and rising by 5 percent per year thereafter. The low carbon costs load
17 forecast scenario reflects a fee of \$10 per metric ton of CO₂ beginning in 2020 and also rises
18 by 5 percent per year thereafter. Carbon tax impacts for both scenarios are based on analysis

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 conducted by the Energy Information Analysis (EIA) and reflect impacts developed for the
2 East South Central Census region. Summary results of the EIA study are discussed on pages
3 56-57 in the IRP report. More detail results of the EIA study are presented in their report
4 titled *Further Sensitivity Analysis of Hypothetical Policies to Limit Energy-Related Carbon*
5 *Dioxide Emission, Supplement to the Annual Energy Outlook 2013, July 2013*. An electronic
6 version of this report was provided in response to AG 1-17 in file
7 AEO2013_SUPPLEMENT.PDF.

8 d. See response to subpart c, above.

9 e. A premium equal to 50% of the carbon cost was added to market energy
10 prices in each of the high and low carbon cost cases. For instance, in the High Carbon Cost
11 Case, a \$30/ton price of CO₂ was modeled in 2020. In that year a premium of \$15/MWh
12 was added to the market energy price. The carbon price and the market energy premium
13 were assumed to escalate at 5% per year. Similarly, in the Low Carbon Cost Case, a \$10/ton
14 price of CO₂ and a \$5/MWh market energy price premium were modeled in 2020. These
15 prices were escalated at 5% per year. The market energy price premium was assumed to be
16 50% of the carbon cost to represent cost impacts associated with gas-fired resources, which
17 are likely to be marginal resources. Gas resources generally emit CO₂ at levels near 1,000

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

- 1 pounds/MWh or 50% of a ton per MWh. No detailed analyses or specific documents were
- 2 used to support the selection of the premium.
- 3
- 4 **Witnesses)** John W. Hutts and Brian D. Smith, GDS

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 18) Refer to Big Rivers' response to SC 1-38**

2 **a. Please provide all supporting documents to how Big Rivers determined**
3 **costs to be avoidable or non-avoidable.**

4 **b. Please provide a forecast of all avoidable and non-avoidable transmission**
5 **and distribution expenditures over the IRP planning period**

6
7 **Response)**

8 a. For purposes of the demand response potential study, costs were deemed to be
9 avoidable if a reduction in Big River's 1-hour system coincident peak demand would reduce
10 the cost of capacity purchases, generation costs, transmission costs, or distribution
11 construction. If such costs could not be reduced due to a reduction in the system peak
12 demand, they were deemed to be non-avoidable. There are no documents responsive to this
13 request.

14 b. For the study, Big Rivers assumed that all transmission and distribution
15 capacity costs are unavoidable for the following reasons.

16 The planned transmission system additions included in the IRP planning process are
17 all near-term additions (through 2018). While demand response programs have the potential
18 to result in the deferral of transmission projects, it is unreasonable to assume such a program

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 could be implemented within the time frame and to the magnitude necessary to defer a near-
2 term project. Therefore, all planned system additions are considered non-avoidable
3 expenditures and are included in the response to AG 1-22.

4 The ability to avoid distribution investment is dependent on local conditions at the
5 substation level or even circuit level. For the demand response study, Big Rivers estimated
6 that it could have 34.7 MW under control within ten years with a reasonably aggressive
7 program (5% of the 2023 native system peak demand). Assuming that demand response
8 ("DR") capability is evenly distributed means that, within ten years, demand at any of the 94
9 distribution substations could see only a 370 kW reduction in demand. Given the low level
10 of reduction at any one substation and the amount of time required to achieve that level, Big
11 Rivers assumed distribution construction planning would not be impacted by a DR program
12 at this time.

13 Finally, most DR resources do not permanently reduce peak demand but, rather, shift
14 consumption. This means that local demand conditions at individual substations may not be
15 permanently reduced by DR resources.

16 These factors together lead Big Rivers to assume that no distribution capacity costs
17 are avoidable and all are therefore considered non-avoidable. Big Rivers does not own or

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

- 1 operate any distribution plant and cannot provide any projection for distribution system
- 2 expenditures.
- 3
- 4 **Witness)** Russell L. Pogue

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 19) Please refer to Big Rivers' response to SC 1-8 in this proceeding and to**
2 **SC 1-10 in case 2013- 00199.**

3 **a. Please confirm that SC 1-10 in case 2013 - 00199 only identifies 22.3 MW**
4 **in total.**

5 **b. Please confirm that the Big Rivers IRP, page 22 identifies 25 MW of**
6 **growth in native load.**

7 **c. Please explain the discrepancy in the two values of new native load**
8 **identified in subsections a and b of this question.**

9 **d. For each of the loads identified in SC 1-10 and for the additional 2.7 MW**
10 **in the IPR identify:**

11 **i. The type of addition.**

12 **i. The amount of load.**

13 **iii. The load factor.**

14 **iv. The date by which such additional load came online or is coming**
15 **online.**

16 **v. The amount of energy expected to be sold to such customers.**

17

18

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Response)**

2 a. Confirmed.

3 b. Confirmed.

4 c. The number provided in the IRP was rounded.

5 d. Big Rivers objects that this request is overly broad and unduly burdensome.

6 Notwithstanding this objection, and without waiving it, please see Big Rivers' response to
7 subpart c with respect to the "additional 2.7 MW."

8

9 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 20)** **Refer to Big Rivers' response to AG 1-12.**

2 **a.** **Identify any entity with which Big Rivers has discussed in 2014 the**
3 **potential sale or lease of the Coleman plant.**

4 **b.** **For each such entity, explain the status of such discussions.**

5 **c.** **State whether Big Rivers performed any modeling that included the sale**
6 **or lease of the Coleman plant.**

7 **i.** **If no, why not?**

8
9 **Response)** Big Rivers objects to this question on the grounds that it is overly broad and
10 not reasonably calculated to lead to the discovery of admissible evidence. Notwithstanding
11 this objection, and without waiving it, Big Rivers states as follows.

12 **a.** See objection.

13 **b.** See objection.

14 **c.** No. Big Rivers will evaluate offers to purchase or lease the Coleman plant on
15 a stand-alone basis, when any such offer is received.

16

17 **Witness)** Lindsay N. Barron

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to Ben Taylor and Sierra Club's
Supplemental Request for Information
Dated September 26, 2014

October 15, 2014

1 **Item 21)** Refer to Big Rivers' response to AG 1-12.

2 a. Identify any entity with which Big Rivers has discussed in 2014 the
3 potential sale or lease of the Wilson plant.

4 b. For each such entity, explain the status of such discussions.

5 c. State whether Big Rivers performed any modeling that included the sale
6 or lease of the Wilson plant

7 i. If no, why not?
8

9 **Response)** Big Rivers objects to this question on the grounds that it is overly broad and
10 not reasonably calculated to lead to the discovery of admissible evidence. Notwithstanding
11 this objection, and without waiving it, Big Rivers states as follows.

12 a. See objection.

13 b. See objection.

14 c. No. Big Rivers will evaluate offers to purchase or lease the Wilson plant on a
15 stand-alone basis, when any such offer is received.
16

17 **Witness)** Lindsay N. Barron