

JUN 14 2021

PUBLIC SERVICE
COMMISSION

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

| | | |
|---|---|------------|
| ELECTRONIC APPLICATION OF BIG RIVERS |) | |
| ELECTRIC CORPORATION FOR A CERTIFICATE OF |) | |
| PUBLIC CONVENIENCE AND NECESSITY |) | CASE NO. |
| AUTHORIZING THE CONVERSION OF THE GREEN |) | 2021-00079 |
| STATION UNITS TO NATURAL GAS-FIRED UNITS |) | |
| AND AN ORDER APPROVING THE ESTABLISHMENT |) | |
| OF A REGULATORY ASSET |) | |

PUBLIC COMMENTS OF SIERRA CLUB

On behalf its many Kentucky members who are ratepayers of Big Rivers Electric Corporation (“Big Rivers”), Sierra Club hereby submits these public comments for the Commission’s consideration in deciding whether to grant Big Rivers’ request for a Certificate of Public Convenience and Necessity (“CPCN”) to convert its Green power plant to burn gas instead of coal starting in mid-2022.¹ Sierra Club respectfully submits that Big Rivers’ request should be denied.

Converting Green to gas-fired would not be prudent because a clean power portfolio—including renewable generation, storage, and efficiency/DSM—would serve Big Rivers’ needs for power and capacity more economically (not to mention co-benefits in public health, climate, and potential job creation). To that end, Sierra Club offers for the Commission’s consideration the Technical Comments attached as Exhibit A hereto. As the Technical Comments illustrate, Big Rivers has the potential to save its customers tens of millions of dollars by pursuing a clean power portfolio implemented as early as 2023, instead pursuing a gas conversion, with the level

¹ Sierra Club acknowledges that the Commission granted a joint motion by the parties to this proceeding to cancel the hearing in this matter—in effect also canceling any opportunity for the public to be heard orally—and thus to decide this case on the written record. Sierra Club submits that the Commission should continue to accept and consider written comments in this proceeding until a final order is issued,

of savings varying with how much DSM is pursued. Sierra Club respectfully implores the Commission to deny Big Rivers' request, at least on this record, and to instruct the utility more robustly to model and consider (relative to their analysis to date) the potential of a clean energy portfolio to serve its needs.

Notably, Big Rivers does not require the conversion of Green in 2022 in order to satisfy an immediate need, as demonstrated by the utility's own stated "optimal" plan in its 2020 IRP, in which Big Rivers proposed retire Green in 2022 and to add gas combined cycle capacity in 2024.² Therefore, Big Rivers has adequate time to consider more robustly the relative competitiveness of clean portfolio to meet needs following the retirement of Green's coal-fired units. Moreover, a fresh analysis of alternatives sometime between now and the lead-up to 2024 would have the benefit of being able to incorporate updated (and hence more accurate going forward) economic/market forecasts as well as updated regulatory/legislative conditions, which could be particularly significant in light of the recent change in administrations (Big Rivers' analysis in this case, as well as its 2020 IRP, was predicated on regulatory/legislative inputs prevailing under President Trump and EPA Administrator Wheeler).³

For these reasons, and as discussed more thoroughly in the attached Technical Comments, Sierra Club respectfully urges the Commission to deny Big Rivers' instant request for a CPCN—or, at the least, to require Big Rivers to conduct and submit modeling that more robustly considers a clean power portfolio alternative, and does so based on updated

both for fairness and to assist with a full consideration of the matters at hand.

² See, e.g., Case No. 2020-00299, *Electronic 2020 Integrated Resource Plan of Big Rivers Electric Corporation*, 2020 Integrated Resource Plan at 33, 155-56.

³ See, e.g., *id.*, Big Rivers Responses to the Sierra Club's Initial Requests for Information Dated February 26, 2021 (March 19, 2021) [attached hereto as Exhibit B], Response No. 2; *id.*, Big Rivers Responses to the Sierra Club's Supplemental Requests for Information dated April 20, 2021 (May 11, 2021) [attached hereto as Exhibit C], Response No. 2.

economic/market and regulatory/legislative inputs. Sierra Club thanks the Commission for considering these comments and, as always, for serving the interests of Kentucky ratepayers.

* * *

Sierra Club is one of the oldest and largest conservation groups in the country, with approximately 3.5 million members and supporters across its sixty-four chapters, which cover all 50 states, the District of Columbia, and Puerto Rico. More than 6,300 Kentuckians belong to Sierra Club’s Kentucky Chapter, whose address is: Sierra Club, Kentucky Chapter, PO Box 1368, Lexington, KY 40588. Sierra Club has many years of experience working on energy and electric generation issues throughout the United States, including in the Commonwealth, advocating for robust cost-effective investments in clean generation, demand response, energy storage, energy efficiency, and renewable energy—all of which produce jobs while reducing electric system costs for both customers and utilities, and reducing reliance on dirty, climate-threatening generation. Many of Sierra Club’s Kentucky members are residential electricity customers of Big Rivers, and thus are directly affected by the compliance plans and associated cost recovery of which Big Rivers has requested for approval in these dockets. Accordingly, the Commission has previously granted Sierra Club’s intervention in various PSC cases filed by Big Rivers, including the pending docket on the utility’s 2020 IRP, Case No. 2020-00299.

Dated: June 10, 2021

Respectfully submitted,

/s/ Matthew E. Miller
Matthew E. Miller, Esq.
Staff Attorney
Sierra Club Environmental Law Program
1536 Wynkoop Street, Suite 200
Denver, CO 80202
Office: 303-454-3344
Email: matthew.miller@sierraclub.org

EXHIBIT A

Sierra Club Technical Comments in PSC Case No. 2021-00079: Clean Energy Portfolio Cost-Effectively Replacing R D Green Coal Units by 2023, Avoiding CCR Compliance Costs

I. Overview

Sierra Club analysts find, based on an analysis of publicly available information, that a clean energy portfolio (CEP) could provide the same energy and capacity requirements as Big Rivers' R.D. Green coal-fired power plant converted to gas-firing, at a cheaper cost, as early as 2023. **Using clean energy rather than converting to gas would save customers over \$95.7 million dollars over the lifetime of the resource.** These findings are based on relatively conservative assumptions about the technology, economics, and legal requirements. Interceding developments, such as more stringent regulations or faster technological advancements, could move up those dates.

The clean energy portfolio Sierra Club assesses in this analysis consists of wind, solar, storage, energy efficiency, and/or demand response technologies. It is a more robust mix of resources than the alternative that Big Rivers appears to have considered to date as a possible replacement option for Green, namely a gas conversion only. **While Big Rivers should include increased demand-side management (DSM) in its replacement clean energy portfolio, even if it does not, the CEP without any DSM is still lower cost than the gas conversion in 2025 and would save customers \$86.0 million over the lifetime of the resources.**

This analysis suggests that, from a cost-savings perspective alone, Big Rivers should revisit its plans to invest millions of dollars in this gas conversion. Instead, Big Rivers should retire Green by 2022 as planned and replace it with a cheaper clean energy portfolio.

II. Analysis

In our methodology, the CEP is constructed to match the energy, peak capacity, and ramping characteristics of the Green coal plant converted to gas. Portfolios are optimized to satisfy these needs at the lowest cost possible. The technologies included in the model are various forms of energy efficiency and demand response measures within residential, commercial, and industrial customer sets, as well as wind, utility scale solar PV, and battery storage. Once a CEP is built by the model to match the converted coal plant's performance, we compare the cost of building *and* operating that CEP to the going forward costs of operating the converted coal plant. When the CEP cost becomes cheaper, the coal plant is 'stranded' by the CEP. In an economist's terms, this is when the *total* cost of a new solution becomes cheaper than the *marginal* cost of an existing solution. At this point, the sunk costs of the converted coal plant are the same in both the CEP

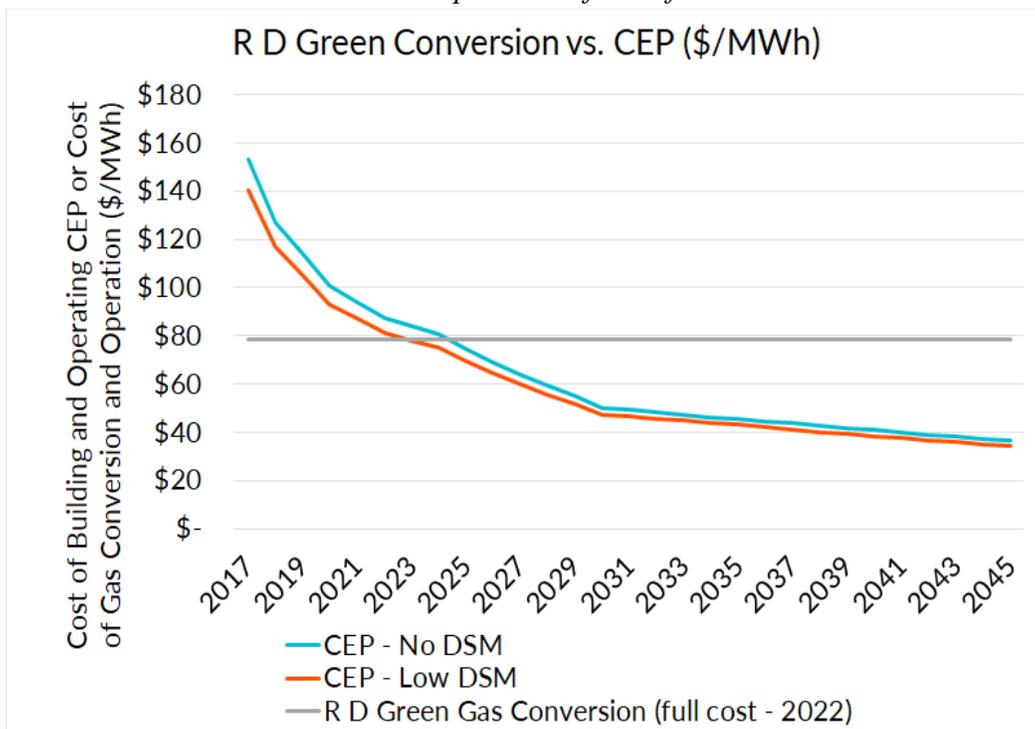
case and the converted coal plant case, but going forward the only way to save customers money is to build and operate the CEP.

The results of the CEP model are shown below in Figure 1 (cost comparison with converted coal plant) and Table 1 (technology mix of the clean energy portfolio). The levelized cost of energy (LCOE) of the CEP would be lower than the cost of the gas conversion in 2023, only one year after the proposed conversion. More details on our methodology and data sources are discussed in the Sources and Methodology section below.

This result means that Big Rivers should not be considering conversion of the Green coal plant to burn gas and instead should plan for replacement with clean energy sources. In Big Rivers’ “optimal plan” in the IRP, they planned to retire Green in 2022 and not receive energy from a newly built gas plant until 2024.

Our analysis shows that a clean energy portfolio could cost-effectively replace all units of Green by 2023, only one year after Green retires and before the “optimal plan” in the IRP expects the new gas plant online. Using clean energy rather than converting to gas would save customers over \$95.7 million dollars over the lifetime of the resource. This is based on the net present value of the gas conversion or clean energy portfolio over a 20 year operating lifetime.

Figure 1: Cost comparison of building and operating a new clean energy portfolio vs. cost of conversion and operation of coal-fired Green



Importantly, a portion of the CEP can be supplied by demand-side technologies that are cheaper than building large new power plants and thus save customers more money.

The technology mix selected energy efficiency in the form of commercial lighting and residential space cooling, and industrial demand response. Big Rivers can pursue higher levels of energy efficiency and demand response for its customers if it wants to find the most cost-effective energy and capacity replacements for this aging coal plant.

In 2019, the American Council for an Energy Efficient Economy (ACEEE) gave utilities in Kentucky a 1 out of 20 score (the lowest possible score) on their energy efficiency scorecard.¹ In their 2020 scorecard, ACEEE found that on average utilities will achieve energy efficiency savings equivalent to 1% of their annual sales.² According to EIA-861 filings, Big Rivers together reported average annual incremental savings from energy efficiency of 1,242 megawatt-hours (“MWh”) for 2019 within the commercial sector.³ Their total commercial sector sales for 2019 was 610 thousand MWh/year, leading to an energy efficiency achievement of 0.2% of sales. This is an incredibly low level of achievement; it means that the utility is leaving most of the cost-effective energy efficiency potential unmet. The achievement in the residential sector was negligible with only 29 MWh of efficiency savings reported by Big Rivers compared to 1.4 million MWh in residential electricity sales.

While Big Rivers should include increased demand-side management (DSM) in its replacement clean energy portfolio, even if it does not, the CEP without any DSM is still lower cost than the gas conversion in 2025 and would save customers \$86.0 million over the lifetime of the resources.

Table 1: Technology breakdown for clean energy portfolio to replace R D Green

| CEP Composition (MW) | Solar | Wind | Battery Storage | Energy Efficiency | Demand Response |
|----------------------|-------|------|-----------------|-------------------|-----------------|
| CEP - No DSM | 681 | - | 454 | - | - |
| CEP - Low-DSM | 606 | - | 406 | 66 | 52 |

¹ ACEEE State and Local Policy Database, Kentucky (navigate to the “Utilities” tab), available at: <https://database.aceee.org/state/kentucky>.

² 2020 Utility Energy Efficiency Scorecard (Feb. 2020), Grace Relf *et al.*, ACEEE, at p.26 table 8, available at: https://www.aceee.org/sites/default/files/pdfs/u2004%20rev_0.pdf (compilation of data in table).

³ See below for EIA and other sources as well as methodology.

III. Sources and Methodology

Sources

The data sources for this analysis are from public sources and S&P Global Market Intelligence, including data reported by Big Rivers Electric Cooperative to the Energy Information Administration (EIA) on fuel costs. Data from S&P Global Market Intelligence is based on their industry estimates for cost items that Big Rivers does not directly report on. In this case, S&P uses regressions based on plant age, generation, and capacity data from plants and utilities that are forced to report both fuel and maintenance costs.

- Gas prices: EIA US Natural Gas Prices:
https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_m.htm
- Coal and gas price forecasts: EIA Annual Energy Outlook 2020 Reference case:
<https://www.eia.gov/outlooks/aeo/>
- Variable and fixed operations and maintenance costs: Sargent and Lundy. “Generating Unit Annual Capital and Life Extension Costs Analysis”.
https://www.eia.gov/analysis/studies/powerplants/generationcost/pdf/full_report.pdf
- Capital expenditures: EIA Annual Energy Outlook
<https://www.eia.gov/outlooks/aeo/assumptions/pdf/electricity.pdf> (p. 14)
- Clean Energy Portfolio algorithm: Rocky Mountain Institute, “The Growing Market for Clean Energy Portfolios,” <https://rmi.org/insight/clean-energy-portfolios-pipelines-and-plants/>

Fuel switched plant costs

In order to estimate the levelized cost of energy for a fuel-switched RD Green for a 20 year operating life, we constructed a model to project future costs. All of the assumptions and projections are derived from publicly available information. To build our model, we created starting assumptions or built projections for the following values:

- Capacity factor: The capacity factor stays fixed for the entire period at 19%, which is the average of capacity factors in 2018-2020 for gas combustion turbines located in MISO Kentucky, Illinois, or Indiana.
- Fuel costs: The 2020 average electric power price for Indiana gas plants was used: \$2.16/MMBtu. No price was available for Kentucky, per EIA reporting.⁴ We assumed a heat rate of 11,500 British thermal units (Btu) per kilowatt-hour (kWh) for the fuel switched RD Green. This is the average of the two units’ heat rates for 2019, as we assume the heat rate will not improve materially with the fuel switched boiler.

⁴ EIA, Indiana Gas Prices. https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SIN_a.htm

- Fixed and variable O&M expenses: We used Sargent & Lundy estimate for fixed and variable O&M expenses as a starting point and inflated by two percent per year, in line with standard inflation.⁵
- Annual capital expenses: Ongoing annual capital additions were estimated at \$18.86/kW-year and inflated by two percent per year to account for normal inflation.⁶
- The levelized cost of energy (LCOE) was calculated by taking an annualized payment of the net present value of all costs (using a discount rate of seven percent) and dividing it by annual generation.

Clean energy portfolio

Given that continuing to run this coal plant converted to gas would be a net cost to customers compared with the energy market, the next step in the analysis is to investigate whether it can be cost-effectively replaced with clean energy and on what timeline. For this analysis, we used the Rocky Mountain Institute's (RMI) Clean Energy Portfolio's algorithm originated in its 2019 report "The Growing Market for Clean Energy Portfolios" to identify a suite of clean energy technologies (wind, solar, storage, energy efficiency, and demand response) that could replace the services of the converted coal plant. Updates to the algorithm are

A clean energy portfolio, or CEP, is a combination of renewable energy, storage, and demand-side management (DSM) projects that meet the needs of the grid and a utility's customers. We use the term DSM to collectively refer to energy efficiency projects (which lead to a reduction in load) and demand response projects (which lead to the shifting or temporary reduction of load). The use of CEPs differs from traditional resource planning, which typically focuses on a specific technology. Instead, a CEP looks at how a range of available clean energy resources could contribute in each hour of the year, and finds the combination that meets the unique needs of customers at the lowest feasible cost. In this study, the CEPs are constructed to match the energy, peak capacity, and ramping characteristics of the converted coal plant. Portfolios are optimized to satisfy these needs at the lowest cost possible.

The CEPs are conservatively designed to meet peak capacity needs in the top 50 hours of capacity need of the year in the MISO balancing area, the grid region where Big Rivers and its converted coal plant operates. The CEP also must meet the average monthly energy requirement of the converted coal plant's total generation in each month based on 2018 to 2020. The CEP algorithm errs on the side of caution, in the sense that other grid resources (like existing gas plants or market purchases) play no role in the replacement, but those resources are typically included in system dispatch or capacity expansion models that utilities utilize in portfolio analysis. In other words, the CEP algorithm accounts for a complete energy and capacity

⁵ See report page 65/179 of Sargent and Lundy, *supra*, steam units under 500 megawatts.

⁶ Sargent and Lundy. Page 66/179.

replacement of the coal plant *without the benefit of any other existing grid resources*. We assume that energy efficiency and demand response could only account for up to 25 percent of the replacement energy and capacity of replacement portfolios, respectively.

RMI's model uses storage and renewable cost assumptions from NREL ATB Advanced scenario — a government issued report.⁷ In addition, the modeling includes the solar investment tax credit, excludes the wind production tax credit, and includes an investment tax credit for storage (even though many storage projects qualify for that tax credit by pairing with solar). Any excess energy that renewables produced above and beyond the converted coal plant was valued at \$15/MWh.

* * *

Dated: June 10, 2021

/s/ John Romankiewicz

John Romankiewicz
Senior Analyst
Sierra Club Beyond Coal Campaign

/s/ Cara Bottorff

Cara Bottorff
Analyst
Sierra Club Beyond Coal Campaign

⁷ National Renewable Energy Laboratory, Annual Technology Baseline. <https://atb.nrel.gov/>

ORIGINAL



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

| | | |
|---|---|-------------------|
| ELECTRONIC |) | Case No. |
| 2020 INTEGRATED RESOURCE PLAN OF |) | 2020-00299 |
| BIG RIVERS ELECTRIC CORPORATION |) | |

**Responses to the Sierra Club's
Initial Requests for Information
dated February 26, 2021**

FILED: March 19, 2021

ORIGINAL

BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

VERIFICATION

I, Nathaniel A. ("Nathan") Berry, verify, state, and affirm that the data 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.

Nathaniel A. ("Nathan") Berry

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Nathaniel A. ("Nathan") Berry on this the 19th day of March, 2021.

Notary Public, Kentucky State at Large

Kentucky ID Number KY NP16841

My Commission Expires October 31, 2024

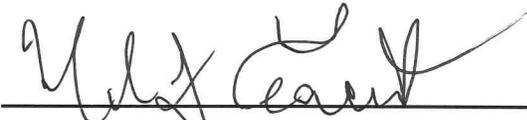


BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

VERIFICATION

I, Mark J. Eacret, verify, state, and affirm that the data 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)

19th SUBSCRIBED AND SWORN TO before me by Mark J. Eacret on this the
day of March, 2021.



Notary Public, Kentucky State at Large

Kentucky ID Number KYNP16841

My Commission Expires October 31, 2024



BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

VERIFICATION

I, Michael S. ("Mike") Mizell, verify, state, and affirm that the data 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.



Michael S. ("Mike") Mizell

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Michael S. ("Mike") Mizell on this the 19th day of March, 2021.



Notary Public, Kentucky State at Large

Kentucky ID Number KYNP16841

My Commission Expires October 31, 2024



**ELECTRONIC
2020 INTEGRATED RESOUCCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club’s
Initial Requests for Information
dated February 26, 2021**

March 19, 2021

1 Item 1) *Refer to the IRP’s references to the possibility of forming a*
2 *coalition of partners to invest in a 592 MW natural gas combined cycle*
3 *(“NGCC”) unit to be located at the Sebree site or the Coleman site, see IRP pp.*
4 *33,137,140.*

5 a. *Please confirm whether this plan remains a part of Big Rivers’*
6 *preferred scenario.*

7 b. *Please provide a detailed narrative update on all efforts and*
8 *progress, if any, related to forming such a coalition and planning to*
9 *invest in that unit.*

10 c. *Please identify and provide copies of all correspondence, memos,*
11 *reports, presentations, or other documents comprising or*
12 *referencing such efforts and progress, if any.*

13

14 **Response)**

15 a. Big Rivers confirms that a portion of a NGCC located at the Sebree or
16 Coleman site would be the optimal least–cost option per the analysis in Big
17 Rivers’ 2020 IRP.

Case No. 2020-00299

Response to SC 1-1

Witnesses: Nathaniel A. Berry (*a. only*) and
Mark J. Eacret (*b and c. only*)

Page 1 of 3

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Initial Requests for Information
dated February 26, 2021**

March 19, 2021

- 1 b. Over the course of the summer of 2020, two or three conference calls were
2 held with entities that Big Rivers had identified as potential partners.
3 What Big Rivers found was that, for a variety of reasons, none of the parties
4 were willing to make a commitment at this time. Some had other
5 approaches to generation additions that they preferred, some preferred
6 different locations, some saw the capacity and energy markets as a better
7 option for at least the next five (5) years, and others were not at a point in
8 their resource planning process to be able to make a decision. Big Rivers
9 continues to explore the option of forming a coalition of partners to invest
10 in a 592 MW NGCC unit located at the Sebree or Coleman Site.
- 11 c. Big Rivers objects to this request as it is overly broad and seeks information
12 neither relevant nor likely to lead to the discovery of admissible evidence.
13 Any documentation of past discussions with third parties would not assist
14 the Commission's or the Sierra Club's evaluation of Big Rivers' 2020
15 Integrated Resource Plan. Big Rivers' above response to sub-part b. of this
16 request provides the relevant information, that none of the third parties
17 were willing to make a commitment. Further, the potential partners with

**ELECTRONIC
2020 INTEGRATED RESOUCCE PLAN OF
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**Response to the Sierra Club's
Initial Requests for Information
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March 19, 2021

1 whom Big Rivers has discussed the matter include non-parties to this
2 proceeding and even entities not under the jurisdiction of the Commission.
3 Disclosing the identities of these entities would constitute a clearly
4 unwarranted invasion of personal privacy and would disclose third-party
5 proprietary information.

6

7

8 **Witnesses)** Nathaniel A. Berry (*a. only*) and

9 Mark J. Eacret (*b. and c. only*)

10

ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299

Response to the Sierra Club's
Initial Requests for Information
dated February 26, 2021

March 19, 2021

1 Item 2) *Refer to the IRP's references to carbon regulation, including the*
2 *Clean Power Plan ("CPP") rule and Affordable Clean Energy ("ACE") rule,*
3 *see IRP pp. 107-108, and to carbon taxes, trading, or other functional pricing,*
4 *see, e.g., id. pp. 137, 141, 169.*

5 a. *Please discuss in detail whether and how Big Rivers has amended,*
6 *or will amend, its carbon-related assumptions, forecasts, scenarios*
7 *modeled, preferred scenario, or other planning components, in*
8 *response to each of the following developments subsequent to the*
9 *2020 IRP's finalization:*

10 i. *The end of the Trump administration and the commencement*
11 *of the Biden administration, including changes (realized and*
12 *prospective) to carbon-related announced by the White House,*
13 *the U.S. Environmental Protection Agency ("EPA"), or another*
14 *agency.*

15 ii. *The D.C. Circuit's January 19, 2021, decision vacating the ACE*
16 *rule and remanding the record to EPA, see Am. Lung Ass'n v.*
17 *Env'tl. Prot. Agency, 985 F.3d 914, 922 (D.C. Cir. 2021).*

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Initial Requests for Information
dated February 26, 2021**

March 19, 2021

1 *iii. Any other development or reason that has caused Big Rivers to*
2 *amend its planning vis-à-vis carbon emissions or climate*
3 *change (if any, please identify that development/reason).*

4 *b. Please identify and provide copies of all correspondence, memos,*
5 *reports, presentations, or other documents comprising or*
6 *referencing the amendment of planning referenced in (a) above.*

7

8 **Response)**

9 a. As of this date, and given the lack of any specific legislative or rule making
10 actions by the Biden Administration addressing carbon emissions, Big
11 Rivers has made no amendments or changes to its carbon-related
12 assumptions, forecasts, scenarios modeled, preferred scenario, or other
13 planning components as outlined in its 2020 IRP. Such amendments or
14 changes will be made once specific legislative or regulatory proposals are
15 issued by the Biden Administration and the details of those specific
16 proposals can be evaluated.

**ELECTRONIC
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March 19, 2021

1 i. Other than broad general assumptions, it is not possible to determine
2 what specific impacts the end of the Trump Administration and the
3 Biden Administration's public statements about carbon policy will
4 have until such time as the EPA, or other departments within the
5 Administration, formulate draft rules addressing the topic or until
6 specific legislation designed to impact carbon emissions is proposed.

7 ii. As the Commonwealth of Kentucky has not yet developed its State
8 implementation plan relating to the ACE rule outlining what
9 regulatory steps would be required to comply with the rule, the vacatur
10 of the rule by the D.C. Circuit has had no impact on Big Rivers' carbon-
11 related planning, modeling or assumptions.

12 iii. There are none.

13 b. There are none. Please see Big Rivers' response to sub-part a.

14

15

16 **Witness)** Michael S. Mizell

17

ORIGINAL



COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

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| ELECTRONIC |) | Case No. |
| 2020 INTEGRATED RESOURCE PLAN OF |) | 2020-00299 |
| BIG RIVERS ELECTRIC CORPORATION |) | |

**Responses to Ben Taylor and the Sierra Club's
Supplemental Requests for Information
dated
April 20, 2021**

FILED: May 11, 2021

ORIGINAL

BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

VERIFICATION

I, Nathaniel A. ("Nathan") Berry, verify, state, and affirm that the data 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.



Nathaniel A. ("Nathan") Berry

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Nathaniel A. ("Nathan") Berry on this the 1st day of May, 2021.



Notary Public, Kentucky State at Large

Kentucky ID Number KYNP16841

My Commission Expires October 31, 2024



BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
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VERIFICATION

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Mark J. Eacret

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

17th SUBSCRIBED AND SWORN TO before me by Mark J. Eacret on this the day of May, 2021.



Notary Public, Kentucky State at Large

Kentucky ID Number KYNP16841

My Commission Expires October 31, 2024



BIG RIVERS ELECTRIC CORPORATION

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
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VERIFICATION

I, Michael S. ("Mike") Mizell, verify, state, and affirm that the data 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.



Michael S. ("Mike") Mizell

COMMONWEALTH OF KENTUCKY)
COUNTY OF HENDERSON)

SUBSCRIBED AND SWORN TO before me by Michael S. ("Mike") Mizell on this the 17th day of May, 2021.



Notary Public, Kentucky State at Large

Kentucky ID Number KYNP16841

My Commission Expires October 31, 2024



**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 **Item 1)** *Refer to Big Rivers' response to Sierra Club's RFI 1-1(b), and to*
2 *the IRP's "optimal plan" to form a coalition of partners to invest in a 592 MW*
3 *natural gas combined cycle ("NGCC") unit at Sebree or Coleman, see IRP pp.*
4 *33, 137, 140.*

5 *a. Please confirm that Big Rivers has no update on any efforts or*
6 *progress to form such a coalition occurring since the Company's*
7 *March 19, 2021, response to Sierra Club's RFI 1-1(b). If not*
8 *confirmed, please provide a detailed narrative update on all such*
9 *interceding developments*

10 *b. Explain whether outreach to, or conversations with, potential*
11 *partners will continue between now and when the PSC renders a*
12 *decision in PSC Case No. 2021-00079, or conversely whether such*
13 *efforts to explore the NGCC partnership are on hold pending the*
14 *outcome of that proceeding.*

15 *c. Confirm when within 2024 (e.g., by January 1, December 31, other)*
16 *that preferred scenario in the IRP envisioned Big Rivers taking the*
17 *90 MW from the NGCC.*

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 **Response)**

2 a. Big Rivers confirms that it has no update on any efforts or progress to form
3 a coalition since March 19, 2021.

4 b. While there is currently no outreach and no conversations with potential
5 partners, Big Rivers has not put the effort on hold. These efforts could start
6 again if circumstances warrant.

7 c. January 1, 2024.

8

9

10 **Witness)** Mark J. Eacret

11

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 **Item 2)** *Refer to Big Rivers' response to Sierra Club's RFI 1-2. Please*
2 *confirm that Big Rivers has no update about any new planning or modeling*
3 *related to new assumptions/inputs or forecasts about carbon regulation,*
4 *taxation, trading, or other effective pricing, since the Company's March 19,*
5 *2021, response to Sierra Club's RFI 1-2. If not confirmed, please identify and*
6 *explain all such carbon related updates.*

7

8 **Response)** Big Rivers confirms that there has been no such update.

9

10

11 **Witness)** Michael S Mizell

12

BIG RIVERS ELECTRIC CORPORATION Case No. 2021-00079

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 **Item 3) Refer to Big Rivers' February 28, 2021, application in PSC Case**
2 **No. 2021-00079, Electronic Application Of Big Rivers Electric Corporation**
3 **For A Certificate Of Public Convenience And Necessity Authorizing The**
4 **Conversion Of The Green Station Units To Natural Gas-Fired Units And An**
5 **Order Approving The Establishment Of A Regulatory Asset, in which the**
6 **Company seeks approval to convert the Green Station to gas-fired and to put**
7 **the plants two into service as gas-fired as early as March 11 and April 30,**
8 **2022, respectively, ahead of the plant's June 1, 2022, deadline to cease coal-**
9 **fired operations—a proposal that would supersede the IRP's "optimal" case.**

10 **a. Please identify the specific date, or timeline of dates, of meetings,**
11 **conversations, votes, or other event or processes, when Big Rivers**
12 **decided to replace the IRP's purportedly optimal case—namely,**
13 **forming a coalition of partners to invest in a 592 MW NGCC plant,**
14 **of which Big Rivers would take 90 MW of power—with the now-**
15 **purportedly least-cost plan of converting Green to gas-fired for mid-**
16 **2022 operations. (If such explanation is already present in Big**
17 **Rivers' public filings in Case No. 2021- 00079, and Big Rivers has**

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 *nothing responsive to add beyond that, you may refer Sierra Club to*
2 *the specific portion(s) of that record.)*

3 ***b. Whereas the IRP's optimal case has Green retiring in June 2022, and***
4 ***Big Rivers not taking new power from the potential NGCC until***
5 ***2024, please explain in detail whether and why it is prudent for Big***
6 ***Rivers to convert Green for service by 2022, as opposed to later. In so***
7 ***doing, without limitation, please discuss all reasons why Big Rivers***
8 ***does not believe it would be prudent to idle Green in June 2022 as***
9 ***already planned, conduct a broad evaluation in 2022-2023 of***
10 ***possible options (including a clean power portfolio) for new***
11 ***power/capacity that may be needed by 2024, and then pursue the***
12 ***result of that evaluation at such time ahead of 2024, if indeed***
13 ***power/capacity is needed for 2024. (If such explanation and***
14 ***discussion is already present in Big Rivers' public filings in Case***
15 ***No. 2021-00079, and Big Rivers has nothing responsive to add beyond***
16 ***that, you may refer Sierra Club to the specific portion(s) of that***
17 ***record.)***

ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299

Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021

May 11, 2021

- 1 c. *Whereas the IRP's optimal case has Big Rivers taking only 90 MW of*
2 *power from the potential NGCC in 2024, please explain in detail*
3 *whether and why it is prudent for Big Rivers to convert both Green*
4 *units (whose respective output capabilities as gas-converted units*
5 *will apparently be 211 MW and 203 MW) as opposed to just one. (If*
6 *such explanation is already present in Big Rivers' public filings in*
7 *Case No. 2021- 00079, and Big Rivers has nothing responsive to add*
8 *beyond that, you may refer Sierra Club to the specific portion(s) of*
9 *that record.)*
- 10 d. *Please confirm whether Big Rivers plans on a gas-converted Green*
11 *Station meeting approximately the same, less, or more load than*
12 *coal-fired Green has been satisfying in recent years, and further*
13 *identify what that load (whether the same, less, or more than at*
14 *present) would be. If the answer varies over time, please provide the*
15 *projected/estimated load that all future years in which Big Rivers*
16 *would envision a gas-converted Green operating. (If such*
17 *explanation is already present in Big Rivers' public filings in Case*

BIG RIVERS ELECTRIC CORPORATION^{Case No. 2021-00079}

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club’s
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 *No. 2021-00079, and Big Rivers has nothing responsive to add beyond*
2 *that, you may refer Sierra Club to the specific portion(s) of that*
3 *record.)*

4
5 **Response)** Big Rivers disagrees with the premise of the question that its proposal
6 to convert the two Green Station units to natural gas “supersedes” the optimal plan
7 under the IRP. Partnering in a natural gas combined cycle (“NGCC”) unit is the lower
8 cost option over the long term, but Big Rivers has been unable to identify
9 counterparties willing to invest in the project at this time. Subsequent to the IRP
10 analysis, Big Rivers continued to evaluate ways to resolve its capacity need since the
11 NGCC option was not viable without partners. That analysis (which is included in
12 Big Rivers’ application in Case No. 2021-00079¹) showed that purchasing the capacity
13 in MISO or converting the Green Station units to natural gas were the least-cost
14 options that did not involve a NGCC unit, and were economically equivalent. The

¹ 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*, Case No. 2021-00079. Application filed March 1, 2021.

BIG RIVERS ELECTRIC CORPORATION Case No. 2021-00079

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 Green natural gas conversion has the added benefits of eliminating the market risk
2 that Big Rivers would be subject to were it to rely on market purchases, and providing
3 dynamic voltage support in the Sebree area. *See* Big Rivers' application in Case No.
4 2021-00079; the Direct Testimony of Michael T. Pullen attached as Exhibit A to Big
5 Rivers' application in Case No. 2021-00079; Big Rivers' response to Item 3 of the
6 Commission Staff's Second Request for Information in Case No. 2021-00079.

7 a. Not applicable.

8 b. The IRP analysis evaluated only Big Rivers' capacity needs compared to its
9 native load. It did not include Big Rivers' obligations under its power sales
10 contracts with Owensboro Municipal Utilities ("OMU") and the Kentucky
11 Municipal Energy Agency ("KYMEA") because, on a long-term basis, Big
12 Rivers does not want to build capacity significantly above that needed by
13 its native load in the event those contracts are not renewed, and Big Rivers
14 could provide the capacity needed for those contractual obligations through
15 market purchases. The desire not to have substantial excess capacity is an
16 especially important consideration for Big Rivers after just having gone

BIG RIVERS ELECTRIC CORPORATION^{Case No. 2021-00079}**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299****Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021****May 11, 2021**

1 through substantial efforts over the past decade to mitigate the loss of the
2 smelter load and to right-size our generation compared to our native load.

3 If Big Rivers' application in Case No. 2021-00079 is approved, the
4 cost of the Green natural gas conversion will be fully depreciated over the
5 remaining term of the longer of the OMU and KYMEA contracts. So,
6 converting both units to natural gas does not impose a risk of being left with
7 excess capacity if those contracts are not renewed. Also, since the Green
8 conversion and the option of relying on market purchases for those
9 contractual obligations are economically equivalent, and since the Green
10 conversion eliminates the market risk of the market option, converting the
11 Green unit to natural gas in 2022 is preferred. *See* the Direct Testimony of
12 Michael T. Pullen in Case No. 2021-00079; Big Rivers' responses to Items
13 10, 13, and 14 of the Commission's Staff's First Request for Information in
14 Case No. 2021-00079.

15 c. *See* Big Rivers' response to sub-part b, above; *see also* the Direct
16 Testimonies of Michael T. Pullen and Mark Eacret, attached as Exhibits A
17 and B, respectively, to Big Rivers' application in Case No. 2021-00079.

BIG RIVERS ELECTRIC CORPORATION Case No. 2021-00079

**ELECTRONIC
2020 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2020-00299**

**Response to the Sierra Club's
Supplemental Requests for Information
dated April 20, 2021**

May 11, 2021

1 d. The Green natural gas conversion is for needed capacity. Big Rivers
2 anticipates that the Green units will be dispatched less after the conversion
3 than they are currently. See Big Rivers' response to Item 4 of the
4 Commission Staff's Second Request for Information in Case No. 2021-
5 00079; Big Rivers' response to Item 17 of the Attorney General's Initial
6 Request for Information in Case No. 2021-00079.

7

8

9 **Witness)** Nathaniel A. Berry

10