COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2023 INTEGRATED RESOURCE PLAN OF BIG RIVERS ELECTRIC CORPORATION	)	**Case No. 2023-00310**

SIERRA CLUB'S SUPPLEMENTAL POST-HEARING COMMENTS REGARDING BIG RIVERS' PROPOSED INTEGRATED RESOURCE PLAN

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I. INTRODUCTION

Pursuant to the Public Service Commission's ("the PSC") May 31, 2024 Order in this matter, Sierra Club offers these supplemental post-hearing comments on the Big Rivers Electric Company. ("Big Rivers") 2023 Joint Integrated Resource Plan ("IRP") Big Rivers Electric Company. ("Big Rivers"). In this IRP, Big Rivers falls short of statutory requirements for least-cost planning and reliable service. Big Rivers fails to analyze 1) the reliability of its D.B. Wilson Power Plant ("Wilson"), 2) future environmental compliance costs associated with keeping Wilson online past 2027, 3) retirement and alternative energy procurement scenarios for Wilson and the proposed natural gas combined cycle plant, the ("NGCC"), 4) demand response and 5) economic benefits of taking advantage of federal Inflation Reduction Act tax credits and Infrastructure Investment and Jobs Act clean energy program funding. These deficiencies, evident in hearing testimony and responses to post-hearing information requests, directly violate Kentucky IRP regulations.

In light of these deficiencies, Sierra Club requests that the PSC exercise its well-established power to commence an investigatory docket into Big Rivers failure to provide an adequate IRP and through which Big Rivers may complete a statutorily compliant IRP. In order to ensure statutory compliance, the PSC should require Big Rivers to model and analyze certain inputs and assumptions, including requiring evaluation of a) environmental compliance costs associated with each of the five EPA rules detailed below (including actual CCS costs), b) early retirement and alternative resource scenarios for Wilson, c) alternative resource scenarios for the NGCC plant, d) uncapped demand response scenarios, e) maximizing savings from utility-scale investments incentivized by the Inflation Reduction Act ("IRA"), and f) maximizing savings from clean energy financing programs such as the Energy Infrastructure Reinvestment Program, New Era Program, and Rural America Energy Program. The Commission should require that the newly completed IRP integrate the above required analyses and justify its planning and investment decisions in the re-submitted IRP with these analyses.

II. KENTUCKY'S IRP LAWS AND REGULATIONS SET CLEAR STANDARDS FOR PLANNING AND MODELING

In order to ensure that utilities "furnish adequate, efficient and reasonable service" and charge "fair, just and reasonable rates,"[1] Kentucky regulation requires "regular reporting and commission review of load forecasts and resource plans of the state's electric utilities to meet future demand with an adequate and reliable supply of electricity at the lowest possible cost for all customers within their service areas, and satisfy all related state and federal laws and regulations." 807 K.A.R. 5:058 (necessity, function, and conformity). For that purpose, regulations require that electric utilities file an integrated resource plan ("IRP") every three years.

Regulations explicitly articulate the information that utilities must include in an IRP: historical and projected demand, resource information, financial data, and other operating performance and system information. 807 K.A.R. 5:058 § 1(2). And regulations also specify how the IRP should utilize and analyze that information: it should discuss facts, assumptions, and conclusions, upon which the plan is based and the actions it proposes. *Id.*

In selecting a resource mix, the utility must not only demonstrate how that resource mix satisfies reliable and adequate supply at lowest possible cost, but also test key uncertainties, including alternative resource options that may be cost-effective. *Id.* § 8(1).[2] In describing the resource mix, the utility must "discuss all options considered for inclusion in the plan," including, for example, "demand-side programs." *Id.* § 3 8(2). The IRP should not merely lock in an assumption, but instead toggle between them, showing "how uncertainties in those assumptions and judgments were incorporated into analyses," *id.* § 8(5)(b). Kentucky regulations require utilities to "show their work" by describing screening criteria for resource alternatives[3] and for reliability thresholds.[4] For existing generation, the utility does not assume locked-in-retirement dates and should project costs based on upgrades and deratings. The regulations ask for "[a]ctual and projected cost and operating information for the base year (for existing units) . . . and the basis for projecting the information to each of the fifteen (15) forecast years." *Id.* § 8(3)(b)(12). For resource capacity, such an analysis should include "[p]lanned retirements."

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[1] K.R.S. § 278.030(1)-(2).

[2] The plan must "consider the potential impacts of selected, key uncertainties and shall include assessment of potentially cost-effective resource options available to the utility." *Id.*

[3] "Criteria (for example, present value of revenue requirements, capital requirements, environmental impacts, flexibility, diversity) used to screen each resource alternative including demand-side programs, and criteria used to select the final mix of resources presented in the acquisition plan," *id.* § 8(5)(c).

[4] "Criteria used in determining the appropriate level of reliability and the required reserve or capacity margin, and discussion of how these determinations have influenced selection of options," *id.* § 8(5)(d).

And regulations require that utilities proactively plan for how to refine those analyses so that the utility's resource mix in 15 years is consistent with Kentucky's ratemaking principles.[5]

In sum, Kentucky requires that IRPs provide thorough examination of key issues in resource planning, including changing costs, economic demands, and environmental regulations. The IRP is intentionally and obviously designed to ensure that Kentuckians have access to affordable and reliable electricity by proactively planning for the future and testing assumptions. Utilities must analyze *at a granular level* the economics, reliability, and environmental risk of existing generation and contrast it with other options, including replacement generation.

III. BIG RIVERS IRP FALLS SHORT OF STATUTORY REQUIREMENTS

A. The IRP Fails to Analyze Fundamental Questions Addressing Reliable Service at Lowest Possible Cost

Big Rivers failed to grapple with the reliability of Wilson, the risks and costs of environmental regulation of Wilson, the economic and technological risks and costs associated with carbon capture and storage ("CCS"), and potential cost savings from federal energy financing programs. Big Rivers witnesses openly admitted that they did not address these factors in the IRP, could not commit to addressing them in amended or future plans, and could not justify the non-inclusion of these core issues. These failures mean that Big Rivers is non-compliant with its statutory IRP obligations; the Commission should reject Big River's IRP.

1. The IRP fails to accurately characterize and account for Wilson's diminishing reliability

Big Rivers' IRP fails to accurately characterize Wilson's reliability by ignoring recent events in favor of reliability data averaged over a decade.[6] The IRP states that Wilson "has proven to be a reliable source of baseload generation for Big Rivers and its Members for many decades." IRP at 18. Witness Burden additionally touts Wilson's 85 percent equivalent availability factor ("EAF") from 2013 to 2022. Yet when witness Burden was asked whether Wilson was "highly reliable" in 2022, he said "highly reliable? maybe not."[7] Wilson was of course not highly reliable

[5] Including "[e]xisting and projected research efforts and programs which are directed at developing data for future assessments and refinements of analyses ," *id.* § 8(5)(e); and "[a]ctions to be undertaken during the fifteen (15) years covered by the plan to meet the requirements of the Clean Air Act amendments of 1990, and how these actions affect the utility's resource assessment," *id.* § 8(5)(f).

[6] BREC Response to Sierra Club's Post-Hearing Data Requests, PH-3(b).

[7] Hearing transcript at 1:32:43 (Sierra Club cross-exam of James Burden).

in 2022, because its 2022 EAF was just 70.12%.[8]

Contributing to that low EAF was Wilson's poor performance during Winter Storm Elliott, when Kentuckians needed Wilson the most. During the storm in late December 2022, Wilson failed spectacularly. 417 MW went offline for 2.5 to 6 hours during the storm's peak, and 197 MW were derated from December 19 to January 2.[3] For two weeks spanning the coldest time of year—including during the *entirety* of Winter Storm Elliott—almost half (47%) of the capacity of Big Rivers' coal-fired power plant was unavailable due to mechanical failure. Further, according to Big Rivers' data, all 417 MW of Wilson's coal-fired capacity was unavailable for 2.5 to 6 hours at the height of the storm.

The rest of 2022 reveals 27 days with over 24 hours of 50+ MW derates, nearly a month of unreliability. Wilson also had a high number of short duration immediate forced outages, including many over 10 hours.[9] These failures affected different parts and systems at Wilson.[10]

Big Rivers, however, remains in denial about the reliability of its aging coal plant. The hearing revealed that Big Rivers did not systematically evaluate reliability issues at Wilson during 2022, instead evaluating reliability over many years.[11] And Big Rivers could not identify an EAF threshold under which it would consider a unit's EAF unacceptable.[12] Nor could it articulate how it would assess that an aging unit was breaking down and becoming less reliable. While a year of data may not be representative, the most recent year of outage and derating data for an aging unit is certainly relevant for planning purposes. If an old car's last year of performance was full of repairs and breakdowns, the owner wouldn't look at strong performance over the past decade and determine that no action had to be taken. Big Rivers asserts that a unit's EAF is just one factor in considering reliability, yet it does not provide an alternative analysis, rather assuming D.B. Wilson's reliability as a given. Such assumptions are inappropriate for an IRP process explicitly designed to test assumptions for capacity and reliability. Further, Big Rivers does not examine the costs of remedial measures, this despite Mr. Burden's admission that D.B. Wilson was consistently derated due to

[8] BREC Response to Sierra Club's Post-Hearing Data Requests, PH-3(b).
[9] BREC Resp. to Sierra Club 2-10, Attachment (Wilson GADS Data).
[10] BREC Resp. to Sierra Club 2-10, Attachment (Wilson GADS Data).
[11] BREC Resp. to Sierra Club PH-3(a) ("Big Rivers again states that it does not evaluate generator reliability by observing data from only a single year.").
[12] BREC Resp. to Sierra Club PH-3(c) ("While a unit's EAF over time is certainly a relevant consideration in attempting to ascertain the current and projected values of a generation asset, multiple factors and metrics, both internal and external, require analysis in order to determine whether a unit's reliability is "unacceptable" such that repair, upgrade, or replacement is necessary.").

induced fan issues in 2022.[13]

By ignoring clear reliability issues, Big Rivers attempts to justify forgoing evaluating retirement and portfolio diversification. Doing so places undue risk on Big Rivers' customers who may not be able to access replacement generation when Wilson's costs and derates spiral out of control because Big Rivers' refuses to use the planning resources intended to avert such circumstances.

The IRP process requires that Big Rivers assess reliability issues specifically. *E.g.*, 807 K.A.R. 5:058 § 8(5)(d) . Outages and derates spanning a wide range of issues indicate an aging coal plant with many points of failure. If Wilson is unavailable due to a reliability failure, more than a third of Big Rivers' capacity is immediately offline. The risk of that failure occurring one month out of the year is not a risk that Big Rivers' member-owners can afford.

The Commission should require Big Rivers to account for Wilson's reliability failures in its projections in a new IRP. Big Rivers is inaccurately projecting the availability of current generation, leading to foreseeable inaccuracy in determining when retirement and replacement generation are needed.

2. The IRP fails to take into account compliance costs associated with environmental regulations affecting Wilson

Big Rivers has not adequately accounted for environmental compliance risks at DB Wilson. The Big Rivers IRP fails to analyze significant, concrete environmental compliance costs impacting the DB Wilson unit as a result of several recently finalized federal regulations pursuant to the Clean Air Act, including EPA's new greenhouse gas ("GHG") emissions standards for coal-fired power plants, the mercury and air toxics standards ("MATS"), the Good Neighbor Plan, EPA's effluent limitation guidelines ("ELG") rule, and the coal combustion residuals ("CCR") rule. Notably, draft versions of each of these rules were available at the time that Big Rivers was preparing its 2023 IRP.

Big Rivers should have evaluated the costs of complying with each of these EPA regulations, but failed to do so. Instead, the IRP includes a generic "aggressive carbon-reduction

[13] BREC Resp. to Sierra Club PH-1(d)(i) ("Big Rivers does not track specific remedial measures or maintenance expenses on a GADs-event basis.").

portfolio," which models the retrofitting of the Wilson facility and new planned generation with 90% carbon capture and sequestration ("CCS") technology.[14] Notably, Big Rivers does not support the "aggressive" label for its modeled carbon reduction portfolio. Nor is the portfolio tied to prospective environmental regulations, but rather functions as a modeled carbon tax. The IRP's Encompass Portfolio Sensitivity includes "carbon emission dispatch adders" to account for uncertainties around "[e]nvironmental, political, and economic impacts on carbon emission regulations."[15] The adders essentially raise the costs of carbon pollution in Big Rivers portfolio. However, this does not substitute or map on to an analysis of actual prospective environmental regulations. Big Rivers attempts to rely on generic carbon-reduction scenarios to account for *all* future environmental compliance costs impacting the plant, without evaluating *any* specific environmental regulations that have actually been proposed or finalized or that may preclude entirely certain activities, rather than adding costs. Big Rivers asserts that "[f]uture environmental regulations are uncertain," and that it therefore included the "aggressive carbon reduction portfolio" to "assess the impacts of environmental regulation *without planning for a specific rule*."[16] Big Rivers' approach fails for multiple reasons.

First, although EPA's proposed GHG rule under Clean Air Act Section 111(d) was issued in 2023, Big Rivers admits that it did not evaluate EPA's proposal in the IRP,[17] relying instead on generic carbon-reduction scenarios which are poorly mapped to EPA's actual GHG rule. Big Rivers' generic carbon-reduction scenarios assume CCS is required at DB Wilson. But EPA's new GHG rules do not require CCS for all coal-fired units. Rather, the rules provide several different compliance paths for existing coal-fired units depending on when they retire, and several of these options do not require CCS.[18] As discussed below, Big Rivers did not analyze these alternative compliance paths in the IRP, incorrectly assuming that CCS—the most expensive compliance option —would be required under any carbon regulation scenario.

Second, Big Rivers' limited consideration of compliance costs focuses only on carbon regulation. It does not consider the foreseeable compliance costs of other environmental regulations governing other air pollutants emitted by DB Wilson, such as the MATS rule or the Good Neighbor

[14] IRP at 144.
[15] *Id*. at 148.
[16] *Id.* (emphasis added).
[17] Hearing transcript at 5:16:20 (Sierra Club cross-exam of Michael Mizell) ("Q: Big Rivers did not incorporate planning for [Clean Air Act section] 111d into its IRP correct? A: Correct."); *id.* at 5:17:20.
[18] *See* Hearing transcript at 5:15:40, 5:20:15 (Sierra Club cross-exam of Michael Mizell).

Plan. Big Rivers admits that it did not analyze the compliance costs of these rules in the IRP.[19] Nor does Big Rivers' IRP account for rules regulating wastewater discharges or water pollution, such as the ELG and CCR rules. Big Rivers should have evaluated the costs of compliance with each of these rules as part of the IRP, especially given that each of these rules were either proposed or finalized in early 2023.

Third, Kentucky's IRP regulations specifically require that utilities analyze environmental compliance costs over the IRP planning period. Utilities' resource plans must discuss "[a]ctions to be undertaken during the fifteen (15) years covered by the plan to meet the requirements of the Clean Air Act amendments of 1990, and how these actions affect the utility's resource assessment."[20] Thus, the IRP regulations require Big Rivers to evaluate compliance costs associated with the Clean Air Act Section 111(d) GHG rules, the Good Neighbor Plan, and the MATS rule.

Big Rivers' failure to adequately consider environmental compliance risks in evaluating the long-term economic or legal viability of DB Wilson is a critical flaw in the IRP. Big Rivers' failure to evaluate environmental regulatory risk means that Big Rivers' customers may end up being stuck paying for higher compliance costs, such as expensive plant retrofits, that could have been avoided with adequate planning.

Past Commission decisions illustrate the danger of ignoring environmental compliance costs. In *In re: East Kentucky Power Cooperative for a CPCN for Alteration of Certain Equipment at Cooper Stat.*, Case No. 2013-00259, Order (Feb. 20, 2014) the Commission stated:

> While the Commission recognizes that the capital expenditure in this case (approximately $15 million) is relatively small for an Environmental Compliance Plan, with other projects for this utility and other utilities costing in the hundreds of millions of dollars, we are nonetheless concerned with the lack of sensitivity analysis performed in this case with regard to future environmental rules and regulations, including, but not limited to, the cost of complying with Section 111(d) of the Clean Air Act. While the costs of running additional analyses may have exceeded the benefit of more accurate information in this case, it is troubling that EKPC, through a company witness, indicated that it does not model anticipated future environmental rules and regulations. Modeling future uncertainty is difficult, but doing so can shed important light on decisions such as these. Accordingly, notwithstanding our finding that EKPC was reasonable in not considering potential environmental compliance costs in its analysis given the specific facts of this case, in the future we expect that these types of sensitivity analyses

[19] Hearing transcript at 5:53:15, 5:54:28 (Sierra Club cross-exam of Michael Mizell) (acknowledging that the IRP does not evaluate the Good Neighbor Rule); Hearing transcript at 5:30:48 (Sierra Club cross-exam of Michael Mizell) (acknowledging that IRP did not evaluate MATS rule); BREC Resp. to Sierra Club Data Request 1-11 (no analysis of MATS rule).

[20] 807 K.A.R. 5:058 § 8(5)(f).

will be conducted as part of a utility's prudent evaluation of alternatives to any environmental compliance plan.[21]

a. Clean Air Act Section 111(d) GHG Rules

On May 9, 2024, EPA finalized greenhouse gas standards pursuant to section 111(d) of the Clean Air Act, which require coal-fired power plants to install equipment to reduce greenhouse gas emissions if they plan to retire after 2032.[22] Under the rule, existing coal-fired power plants that plan to operate until 2039 or later—such as DB Wilson's current plan—must install a CCS system that captures 90% of carbon emissions by 2032.[23] Coal-fired plants that commit to retire before 2039 (but after 2032) must meet an emission rate consistent with 40% gas co-firing (a 16 percent reduction in emission rate) by 2030.[24] Coal-fired plants that commit to retire by 2032 are not subject to the rule and need not take any action.[25]

The GHG rule will significantly change the regulatory requirements for DB Wilson. Because Big Rivers currently plans to operate the plant until 2045, the rule will require Big Rivers to install an expensive CCS system to capture 90% of carbon emissions by 2032, within the 15-year planning horizon of this IRP. However, critically, if Big Rivers committed to retire DB Wilson by the end of 2038, it could avoid the CCS requirement and instead retrofit the plant for 40% gas co-firing by 2030, a significantly less expensive proposition. Moreover, if Big Rivers committed to retire the coal-fired unit at DB Wilson by 2032, it would not incur any compliance costs under the GHG rule at all and could replace Wilson's capacity with alternative and potentially more cost-effective resources. But the IRP inexplicably fails to evaluate either of these potentially less-expensive alternative compliance pathways.

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[21] *In re: East Kentucky Power Cooperative for a CPCN for Alteration of Certain Equipment at Cooper Stat.*, Case No. 2013-00259, Order at p. 19 (Feb. 20, 2014); *see also* In the Matter of: *Elec. 2018 Joint Integrated Res. Plan of Louisville Gas & Elec. Co. & Ky. Utilities Co.*, No. 2018-00348, 2020 WL 4209263, at *11 (July 20, 2020) ("The potential impact of existing and future environmental regulations affecting the price of electricity and other economic variables continues to be a topic of significant interest. Therefore, the effects of such regulations should continue to be examined by LG&E/KU as a part of their load forecasts and sensitivity analyses in the next IRP filing.").

[22] New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Elec. Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Elec. Generating Units, 89 Fed. Reg. 39,798 (May 9, 2024).

[23] *Id*. at 39,838; *see* U.S. EPA, Final Carbon Pollution Standards to Reduce Greenhouse Gas Emissions from Power Plants at 6 (Apr. 25, 2024), *available at* https://www.epa.gov/system/files/documents/2024-04/cps-presentation-final-rule-4-24-2024.pdf.

[24] U.S. EPA, *Final Carbon Pollution Standards to Reduce Greenhouse Gas Emissions from Power Plants* at 6 (Apr. 25, 2024), *available at* https://www.epa.gov/system/files/documents/2024-04/cps-presentation-final-rule-4-24-2024.pdf.

[25] *Id.*

More perplexing, Big Rivers' IRP acknowledged "the exceptionally high costs of implementation" of CCS at DB Wilson.[26] Witness Mizell admitted that CCS costs are speculative and potentially high-risk: he noted that as of today, there is no commercially available CCS technology.[27] He further mentioned that current CCS projects have been subject to cost overruns and delays.[28]

Despite this context, Big Rivers IRP includes only a generic "aggressive carbon-reduction portfolio" scenario reflecting CCS installation at DB Wilson by 2032 to achieve 90% carbon capture.[29] And the estimated costs admittedly do not reflect actual technology costs.[30] Big Rivers stated in discovery that it "has not conducted a formal analysis of the potential amount or timing of costs to comply with EPA's proposed greenhouse gas rule" and—referring to CCS—adds that "Big Rivers considers a cost analysis study premature until better and more definitive information becomes available on the viability of the aforementioned control technologies."[31] But Big Rivers' assumption that CCS is required to comply with the GHG rule is incorrect. The assumption that Big Rivers would retrofit Wilson with CCS is particularly inappropriate in a 15-year planning process where the Company should evaluate alternative compliance paths to identify the least-cost, reliable option for its customers.

Indeed, the IRP fails to evaluate the other available compliance pathways under the GHG rule, including retirement of the plant by 2038 and retrofitting for 40% gas co-firing by 2030, and retirement of the plant by 2032,[32] which would avoid any compliance costs under the rule. Witness Mizell acknowledged at hearing that these alternative compliance options are available under the rule, and that they do not require installing CCS at DB Wilson.[33] Yet Big Rivers points to uncertainty about the viability of *CCS* as an excuse to avoid analyzing the GHG rule, including the compliance options that *avoid* the economic risks of CCS entirely. Retrofitting coal-fired plants like DB Wilson to co-fire on gas would require existing, commercially available, proven technology—

[26] IRP at 94-95.
[27] Hearing transcript at 5:25:06 (Sierra Club cross-exam of Michell Mizell); *id.* at 5:15:25 ("There is no commercially available…carbon capture and sequestration system").
[28] Hearing transcript at 5:25:11 (Sierra Club cross-exam of Michell Mizell).
[29] IRP at 144.
[30] *See* Hearing transcript at 5:16:20 (Sierra Club cross-exam of Michell Mizell) ("Q: Big Rivers did not incorporate planning for [Clean Air Act section] 111d into its IRP correct? A: Correct."); *id.* at 5:17:20.
[31] BREC Resp. to Joint Intervenors 1-60(b). *See also* BREC Resp. to Sierra Club post-hearing data request PH-4(b) (stating that as of June 2024 Big Rivers still "has not conducted" any analysis on the cost of complying with the GHG rule).
[32] Hearing transcript at 5:18:35 (Sierra Club cross-exam of Michael Mizell).
[33] Hearing transcript at 5:15:40, 5:20:15 (Sierra Club cross-exam of Michael Mizell).

there is no question as to its viability and there should be no impediment to analyzing that pathway; the only issue was Big Rivers' willingness to do so. And retirement of Wilson in 2032 requires no new technology at all. Big Rivers acknowledged that it "could have" analyzed gas co-firing at DB Wilson or 2032 retirement of the plant in the IRP, but it did not do so, choosing to focus exclusively on CCS, an admittedly costly option.[34] The IRP's failure to consider these alternative, less expensive ways to comply with the GHG rule is a fatal flaw.

The GHG rule creates significant risk for continued operation of Wilson and for economic impact to Big Rivers' customers, particularly if not adequately planned for in advance. Big Rivers should have weighed each of the compliance paths in the rule, evaluating the cost and effects on Big Rivers' generation fleet for each option, in order to engage in responsible resource planning. These economic risks are foreseeable and quantifiable. And as detailed above, Kentucky's resource planning regulations require projecting costs across different scenarios, so that it may compare future costs of Wilson against replacement generation and plan for an affordable and reliable future generation fleet.

Big Rivers points out that its IRP was filed in September 2023, before the GHG rule was finalized in 2024. But EPA's proposed GHG rule was issued in May 2023,[35] as Big Rivers acknowledged in its IRP.[36] Big Rivers had months to review the proposed rule. While there were some substantive changes between the 2023 proposed rule and the 2024 final rule, including changes to the number of compliance categories and compliance dates,[37] those changes mostly affected gas plants: indeed, Big Rivers witness Mizell asserted that changes between the proposed and final rules did not "materially affect" the rule's impact on coal plants.[38] The proposed rule also required DB Wilson to install a CCS system that captures 90% of carbon emissions if Big Rivers

[34] Hearing transcript at 5:18:35, 5:20:30 (Sierra Club cross-exam of Michael Mizell).

[35] Proposed Rule, New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 88 Fed. Reg. 33,240 (May 23, 2023), *available at* https://www federalregister.gov/documents/2023/05/23/2023-10141/new-source-performance-standards-for-greenhouse-gas-emissions-from-new-modified-and-reconstructed.

[36] IRP at 92.

[37] The plant retirement date triggering the CCS requirement was changed from 2040 in the proposed rule to 2039 in the final rule, and the compliance date to install CCS was postponed from 2030 to 2032. See U.S. EPA, *Final Carbon Pollution Standards to Reduce Greenhouse Gas Emissions from Power Plants* at 7 (Apr. 25, 2024), *available at* https://www.epa.gov/system/files/documents/2024-04/cps-presentation-final-rule-4-24-2024.pdf.

[38] Hearing transcript at 5:19:09 (Sierra Club cross-exam of Michael Mizell) ("Q: Do those changes [to the GHG rule] materially affect regulations on coal plants? A: I don't believe so, no.").

plans to operate the plant until 2045.[39] Big Rivers should have fully evaluated the proposed GHG rule in the IRP, as it was reasonably foreseeable that the proposed GHG rules for coal plants would be adopted in 2024.

Moreover, Big Rivers should be updating and modifying its IRP to reflect the final version of the rule, as it promised to do in the IRP. The IRP states that "Big Rivers will continue to monitor the status of the proposed [GHG] rule and will modify its planning as warranted by new developments,"[40] Yet Witness Mizell stated that Big Rivers does not plan to modify its IRP after the publication of the final rule.[41] Contrary to witness Mizell's assertion, finalization of the GHG rule is undoubtedly a development that warrants modifying and updating the IRP. If Big Rivers customers can avoid exorbitant CCS costs and, then Big Rivers has an obligation to its members to analyze the very tangible pathways to potentially reduce costs in an IRP. Yet Big Rivers has not indicated that it has any plans to update the current IRP.

i. Big Rivers should evaluate gas co-firing as a compliance pathway including any possible risks

Although Big Rivers should have evaluated both the gas co-firing compliance option and the 2032 retirement option under the GHG rule, the evidence in this proceeding indicates that retiring DB Wilson by 2032 would be a lower-cost, lower-risk option that would better serve the interests of ratepayers. Retrofitting DB Wilson for gas co-firing would increase the capital investment needed to keep the plant operating.[42] Unfortunately, Big Rivers failed to analyze this compliance pathway, including the necessary capital investments to allow for co-firing, and how this compliance pathway compared to the CCS compliance option. The Commission should require Big Rivers in its re-submitted IRP to evaluate this compliance option, along with any possible negative consequences from such an option such as increased exposure to fuel price volatility and reliability issues.

ii. Costs to Install CCS at DB Wilson

The installation of CCS technology at Wilson would be extraordinarily expensive, and the evidence indicates that CCS would not be cost-effective compared to other compliance options, as it

[39] *See* Proposed Rule, 88 Fed. Reg. 33,240 (May 23, 2023).
[40] IRP at 95.
[41] Hearing transcript at 5:19:09 (Sierra Club cross-exam of Michael Mizell) ("Q: And a finalization of the rule is not a development that would necessitate modification of the IRP? A: No.").
[42] Hearing transcript at 4:54:09 (Sierra Club cross-exam of Michael Mizell).

would only extend the plant's life by five years. EPA's cost calculations published along with the proposed GHG rule made clear that even with the IRA's enhanced tax credit, the installation of CCS technology at Wilson would impose millions of dollars of additional costs on customers.[43] EPA estimated that the capital costs for installation of CCS for Wilson would exceed $2,500/kW,[44] and that even accounting for the IRA's 45Q $85 per ton tax credit, installation and operation of CCS would cost $24 per MWh or $25 per ton of CO_2 removed.[45] This is a significant cost, approaching $100 million *per year*, given that Wilson emits about three million tons of CO_2 annually.[46] Moreover, Big Rivers says that EPA's projections underestimate the cost of CCS at DB Wilson, and that the true cost of CCS would likely be orders of magnitude higher.[47] Big Rivers further acknowledged that parasitic load due to CCS operation would lead to a 281 MW derate for Wilson, as estimated by EPA, reducing Wilson's capacity by over 50 percent.[48] Yet again, the IRP fails to take into account EPA CCS cost or derating estimates, nor does it explain why Big Rivers' cost estimates are more accurate.

iii. Risks of delaying retirement planning

Big Rivers describes the D.B. Wilson Station as "[t]he 'workhorse' of the Company's generating fleet."[49] Wilson provides 37% of Big Rivers' total capacity and 44% of its owned generating capacity.

For this reason, it is especially important that Big Rivers anticipate and have in place a plan for Wilson's realistic impending retirement. The plant has already been in operation for 38 years.[50] By the end of this IRP's 15-year time horizon, Wilson will be 53 years old. Big Rivers has failed to justify this far-in-the-future retirement date in this exceedingly sparse IRP.

Witness Mizell conceded that if the GHG rule stands, it would be advisable to consider retirement options in the *next* IRP.[51] Given that GHG rule compliance would require significant

[43] Exhibit SC-3, EPA CCS Cost Estimates, EPA Doc. EPA-HQ-OAR-2023-0072-0061_attachment_3, *available at* https://downloads.regulations.gov/EPA-HQ-OAR-2023-0072-0061/attachment_3.xlsx.
[44] *Id*.
[45] *Id*.
[46] 2021 and 2022 Annual Power Plant Emissions, Environmental Protection Agency (2023), *available at* https://www.epa.gov/system/files/documents/2023-02/Annual%20emission%20comparison%202021%20vs%202022.xlsx.
[47] Hearing transcript at 5:59:24 (Sierra Club cross-exam of Michael Mizell).
[48] Exhibit SC-3 (EPA CCS Cost Estimates); Hearing transcript at 5:27:01 (Sierra Club cross-exam of Michael Mizell).
[49] IRP at 18.
[50] IRP at 35.
[51] Hearing transcript at 5:25:45 (Sierra Club cross-exam of Michael Mizell).

retrofits by 2030 or replacement generation by 2032, member-owners cannot afford to wait on the next IRP. Reliability considerations further indicate that an earlier retirement date for Wilson is warranted and must be at the very least studied.

The evidence indicates it is imprudent and unreasonable for Big Rivers to choose the CCS compliance pathway, given its high costs and limited benefits compared to other options. Big Rivers must fully evaluate all other options for compliance with the GHG rule, including gas co-firing at Wilson and retirement of Wilson before 2039 and replacement with new generation. And this analysis must occur on a more immediate timeline, so that it remains possible to plan for replacement generation by 2032, if needed, and so that member-owners are not locked into Wilson as an expensive and unreliable energy and capacity resource.

b. MATS Rule

On May 7, 2024, the EPA finalized National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units, commonly known as the MATS rule, to regulate emissions of mercury and other hazardous air pollutants ("HAPs").[52] This rule strengthens the standards for filterable particulate matter ("fPM") emissions from coal-burning plants and reduces existing emissions limits for mercury and HAPS. The rule sets a 2027 compliance deadline for those plants to meet the new standards.[53]

EPA's regulatory impact analysis for the MATS rule concludes that DB Wilson would need to improve or upgrade its fPM control technology in order to comply with the finalized fPM limit by 2027. In the unit-level analysis submitted along with the final MATS rule, EPA identifies Wilson in its list of impacted units.[54] The EPA estimates the annualized costs for Wilson to comply with the 0.010 lb/MMBtu limit would be $88,162.55 per year in 2019 dollars).[55] Thus, if the plant is not retired until 2045, the total MATS compliance costs over the period from 2027 to 2045 could amount to over a million dollars to comply with the 0.010 lb/MMBtu limit and much more if EPA continues to lower the fPM limit. Moreover, EPA shows significant variance in Wilson's historic fPM emissions, with an average emissions rate of 0.0148 lb/MMBtu, significantly above the 0.010

[52] National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, 89 Fed. Reg. 38,508 (May 7, 2024).
[53] *Id*. at XX.
[54] Exhibit SC-6, U.S. EPA. 2024 Update to the 2023 Proposed Technology Review for the Coal- and Oil-Fired EGU Source Category (2024 Technical Memo), Attachment 1, *available at* https://downloads regulations.gov/EPA-HQ-OAR-2018-0794-6919/attachment_1.xlsx.
[55] *Id*.

lb/MMBtu limit.[56] If Wilson's lowest achieved fPM rate (i.e. the 99th percentile emissions rate during the lowest emitting quarter) bumps up closer to its average emissions rate, Big Rivers might have to pay considerably more in compliance costs.[57]

The Big Rivers IRP fails to evaluate the compliance cost impact of the MATS rule on DB Wilson. Big Rivers stated in discovery responses that it did not analyze the cost of the proposed MATS rule because "that rule has yet to be finalized" and asserted that "any cost analysis is premature."[58] Yet the proposed MATS rule was issued in April 2023, five months before the IRP was filed.[59] Big Rivers had ample time to review the impacts of the proposed rule on DB Wilson in its IRP. As noted above, the proposed MATS rule even included a regulatory impact analysis, with cost estimates for DB Wilson,[60] as Big Rivers acknowledges.[61] Big Rivers could, and should, have used the information provided by EPA at the time the *proposed* MATS rule was issued in 2023 to evaluate potential compliance costs in the IRP.

Big Rivers states that it upgraded the plant's flue gas desulfurization (FGD) system in 2023 and claims that it can operate Wilson in such a way that fPM emissions would remain below the rule's 0.010 lb/MMBtu fPM emission standard.[62] At the hearing, witness Mizell further argued that EPA's estimates of MATS compliance costs are inaccurate and asserted that the MATS compliance costs for DB Wilson would be zero.[63] But Big Rivers has not provided any documentary evidence to support this assertion nor provided any analysis disputing EPA's estimates. Big Rivers acknowledges that it did not include any evaluation of MATS compliance in the IRP,[64] and Big

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[56] *Id.*

[57] In the 2023 proposed MATs rule, which set the fPM threshold based on average emissions rate, EPA estimated millions of dollars in annual compliance costs. EPA, Proposed Rule, National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review (Apr. 24, 2023), *available at* https://www federalregister.gov/documents/2023/04/24/2023-07383/national-emission-standards-for-hazardous-air-pollutants-coal--and-oil-fired-electric-utility-steam.

[58] BREC Resp. to Sierra Club Data Request 1-11.

[59] EPA, Proposed Rule, National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review (Apr. 24, 2023), *available at* https://www.federalregister.gov/documents/2023/04/24/2023-07383/national-emission-standards-for-hazardous-air-pollutants-coal--and-oil-fired-electric-utility-steam.

[60] *See* EPA, Proposed Rule - National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, *available at* https://www.epa.gov/stationary-sources-air-pollution/proposed-rule-national-emission-standards-hazardous-air-pollutants; Final version of the RIA for the Proposed EGU MATS RTR (May 8, 2023), *available at* https://www.regulations.gov/document/EPA-HQ-OAR-2018-0794-5837.

[61] Hearing transcript at 5:35:55, 5:38:10 (Sierra Club cross-exam of Michael Mizell).

[62] *See* BREC Resp. to Sierra Club Post-Hearing Data Request PH-5(a).

[63] Hearing transcript at 5:30:08 (Sierra Club cross-exam of Michael Mizell).

[64] Hearing transcript at 5:30:48 (Sierra Club cross-exam of Michael Mizell).

Rivers did not provide any internal cost analysis or other supporting evidence as an exhibit in this proceeding. Moreover, in response to post-hearing data requests, Big Rivers acknowledges that Big Rivers has not undertaken analyses to evaluate "whether the upgraded Wilson FGD unit can meet the updated standards."[65] The Commission should not accept on faith Big Rivers' assertion that the MATs rule would lead to no compliance costs at Wilson. The risk of MATs costs ranging into the millions could very well yield a preference for alternative resources, but yet again Big Rivers has not provided the Commission or member-owners the ability to make this assessment.

c. Good Neighbor Rule

Big Rivers recognizes that EPA's Cross-State Air Pollution Rule ("CSAPR") "has undergone numerous changes impacting Big Rivers' units and leading to uncertainty about operating coal in the near future."[66] However, the IRP fails to analyze how one of the most significant components of the CSAPR, the Good Neighbor Rule, may impact compliance costs at DB Wilson.

In early 2023, EPA rejected 23 states' state implementation plans for complying with the "Good Neighbor" provision of the Clean Air Act. On June 5, 2023, EPA finalized in their place the Good Neighbor Rule, which regulates smog-forming nitrogen oxide (NOx) pollution from power plants in 23 states, including Kentucky.[67] The rule has been stayed in Kentucky due to ongoing litigation challenging the state plan disapproval. If that litigation results in the Good Neighbor Rule being upheld, it will add additional risk and environmental compliance costs to the continued operation of Wilson. Wilson's 2023 NOx ozone season allocation was 393 tons. EPA estimates that under the proposed rule, the 2026 NOx ozone season allocation for Wilson would be 393 tons, over a one-third reduction in allowed NOx pollution.[68]

Big Rivers acknowledges that it did not evaluate the Good Neighbor Rule in the IRP.[69] The IRP mentions in passing that the CSAPR's Good Neighbor provisions represent an "obligation" that

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[65] *See* BREC Resp. to Sierra Club Post-Hearing Data Request PH-5(a)(iii), (b).
[66] IRP at 95.
[67] Federal ''Good Neighbor Plan'' for the 2015 Ozone National Ambient Air Quality Standards, 88 Fed. Reg. 36,654 (June 5, 2023), *available at* https://www.govinfo.gov/content/pkg/FR-2023-06-05/pdf/2023-05744.pdf.
[68] Exhibit SC-5, EPA, Cross-State Air Pollution: Good Neighbor Plan for 2015 Ozone NAAQS, Technical Support Document, Unit-Level Allocations and Underlying Data for the Proposed Rule, *available at* https://www.epa.gov/Cross-State-Air-Pollution/good-neighbor-plan-2015-ozone-naaqs.
[69] Hearing transcript at 5:53:15, 5:54:28 (Sierra Club cross-exam of Michael Mizell) (acknowledging that the IRP does not evaluate the Good Neighbor Rule).

"requires careful analysis of costs,"[70] but the IRP makes no attempt to analyze the compliance costs associated with the Good Neighbor Rule, including the rule's effect on the cost or viability of continued operation of DB Wilson. Instead, Big Rivers asserts that "[g]iven the ongoing legal proceedings . . . Big Rivers has not conducted any . . . formal evaluation or analysis" of the impact of the Good Neighbor Rule on Big Rivers' operations.[71] Given that the Good Neighbor Rule was finalized in June 2023, months before the IRP was filed, Big Rivers should have included an analysis of the final rule in the IRP. The fact that the final rule is subject to ongoing litigation does not excuse Big Rivers' failure to analyze its potential costs. Indeed, one of the key purposes of an IRP is to evaluate competing scenarios, taking into account uncertainties, including regulatory uncertainties and their associated projected costs.

Witness Mizell asserted that even if the Good Neighbor Rule were upheld and ultimately took effect in Kentucky, compliance costs at Wilson would be zero.[72] He claimed that it could operate the plant in such a way that NOx emissions would remain within the rule's emission allowance.[73] But Big Rivers has not provided any supporting documents or analyses to support this assertion. Of note, Big Rivers did not provide any environmental compliance cost analysis as an exhibit in this proceeding. The Commission should require Big Rivers to include analysis of Good Neighbor Plan compliance in a modified and updated IRP.

d. ELG Rule

On May 9, 2024, EPA finalized the ELG rule, which revises effluent limitation guidelines and standards for steam electric power plants such as DB Wilson, including revisions to guidelines and standards applicable to flue gas desulfurization wastewater, bottom ash transport water, combustion residual leachate, and legacy wastewater.[74]

[70] IRP at 55.
[71] BREC Resp. to Joint Intervenors 1-58(b).
[72] Hearing transcript at 5:51:50 (Sierra Club cross-exam of Michael Mizell).
[73] *Id.*
[74] EPA, Final Rule, Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 89 Fed. Reg. 40,198 (May 9, 2024), *available at* https://www.federalregister.gov/documents/2024/05/09/2024-09185/supplemental-effluent-limitations-guidelines-and-standards-for-the-steam-electric-power-generating.

The proposed ELG rule was published by EPA on March 29, 2023.[75] Although the proposed rule was issued months before the IRP was filed, Big Rivers did not evaluate compliance costs associated with the ELG rule in the IRP. The IRP mentions that the ELG rule represents an "obligation" that "requires careful analysis of costs,"[76] but the IRP makes no attempt to analyze those costs or their effect on the continued operation of DB Wilson. Big Rivers should have included analysis of the proposed rule in the IRP.[77]

Big Rivers stated in discovery that it "plans on conducting a comprehensive study of the rule in 2024 to identify corresponding impacts."[78] Big Rivers claims that it is now performing an analysis of ELG compliance costs, but has no plans to modify or update the current IRP to reflect the results of that analysis.[79] Witness Mizell asserted that he did not anticipate the ELG rule would have compliance costs at DB Wilson, but Big Rivers has not provided any documents or analyses to support this assertion, and further acknowledges that its analysis is not yet complete .[80] The Commission should require Big Rivers to update the current IRP to include analysis of ELG compliance risk and costs impacting DB Wilson.

e. CCR Rule

On May 8, 2024, EPA published a final rule which imposes new regulatory requirements for management of coal combustion residuals at coal-fired power plants and other regulated facilities, specifically at inactive surface impoundments containing CCR (referred to as "legacy CCR surface impoundments").[81] Big Rivers has three facilities that include ash ponds (surface impoundments): Coleman Station, Green Station, and Reid Station/HMP&L Station Two.[82] Witness Mizell

[75] EPA, Proposed Rule, Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 88 Fed. Reg. 18,824 (March 29, 2023), *available at* https://www.federalregister.gov/documents/2023/03/29/2023-04984/supplemental-effluent-limitations-guidelines-and-standards-for-the-steam-electric-power-generating#citation-182-p18888.
[76] IRP at 55.
[77] Big Rivers witness Michael Mizell stated that he did not believe there were substantial changes between the proposed ELG rule and the final rule. Hearing transcript at 5:40:46 (Sierra Club cross-exam of Michael Mizell).
[78] BREC Resp. to Joint Intervenors 1-57.
[79] Hearing transcript at 5:40:50 (Sierra Club cross-exam of Michael Mizell).
[80] Hearing transcript at 5:41:41 (Sierra Club cross-exam of Michael Mizell).
[81] EPA, Final Rule, Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 89 Fed. Reg. 38,950 (May 8, 2024), *available at* https://www.govinfo.gov/content/pkg/FR-2024-05-08/pdf/2024-09157.pdf.
[82] IRP at 99.

acknowledged that the Company "likely will" have compliance costs at Coleman Station as a result of the rule.[83]

The Big Rivers IRP does not analyze the economic risk of compliance with the CCR legacy surface impoundment rule at any of its plants. EPA issued the proposed rule in May 2023, months before the Big Rivers issued its 2023 IRP.[84] The IRP states that the Company "is currently reviewing the details of the proposed [CCR] rule and is involved with various trade industry groups in litigation challenging the proposed rule."[85] In discovery, Big Rivers took the position that because the rule has not yet been finalized, "[i]t would therefore be premature for Big Rivers to attempt to 'identify'" "legacy ponds" and "CCR Management Units" at Big Rivers generating stations.[86] This argument fails. Given that the proposed rule was already available, the Company should have analyzed likely compliance costs in the IRP. The mere possibility that the rule might be tweaked between proposed and final iterations, and the fact that the final rule is subject to litigation, do not excuse Big Rivers' obligation to analyze the rule's significant regulatory risks and compliance costs.

3. The IRP fails to account for federal tax credits and clean energy financing programs

Big Rivers has not sufficiently accounted for how the Inflation Reduction Act and other federal clean energy financing programs could lead to lower cost reliable service in its IRP. In the IRP and Appendices 473 pages, the IRA is only mentioned five times, and in a cursory manner.[87] When asked why this was the case, witness Mathews stated that Big Rivers probably did not have the resources to incorporate analysis more fully.[88]

This gap in analysis calls into question the inputs for the modeling underpinning the IRP, particularly its assessment of clean energy and demand side resources. Big Rivers has evidently failed to integrate the IRA's impacts on the cost of qualifying resources into the analysis that went

[83] Hearing transcript at 5:44:53 (Sierra Club cross-exam of Michael Mizell).

[84] EPA, Proposed Rule, Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31,982 (May 18, 2023), *available at* https://www.federalregister.gov/documents/2023/05/18/2023-10048/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric.

[85] IRP at 100.

[86] BREC Resp. to Joint Intervenors 1-59.

[87] IRP.

[88] Hearing transcript at 3:32:48 (Sierra Club cross-exam of Talina R. Mathews).

into selecting its generation portfolio, a core function of the IRP. The IRA's impacts and opportunities are not small. The IRA expands the Investment Tax Credit ("ITC") to cover solar, wind, and energy storage projects and eliminates the planned ITC phasedown to 10 percent, instead keeping base ITC levels at 30 percent.[89] It also makes available separate tax adders for the ITC (+10 percent each) and Production Tax Credit ("PTC") (+0.3 ¢/kwh each) for projects that meet domestic content minimums, are sited in energy communities (e.g. brownfield sites), or are sited in low-income communities or on Indian land.[90]

It does not appear that the IRA's major cost factors for renewable resources were factored into Big River's modeling.[91] Witness Mathews conceded that Big Rivers did not evaluate in its IRP how to take advantage of IRA incentives for wind, solar, and battery storage projects.[92] But she also admitted that the IRP was "the place for Big Rivers to model potential cost savings through alternative resources."[93] She noted that Big Rivers will be taking a "new look" at its resource portfolio with a new leadership team and new strategic plan.[94] However, no Big Rivers witness could confirm that this "new look" would lead to a new compliant IRP, a new RFP, or any other concrete action subject to oversight by this Commission.[95]

Even if the renewable generation modeling *had* factored in IRA savings, Big Rivers undermined any impacts by essentially closing the door on new renewable generation. Because the 2045 retirement of Wilson and the addition of the NGCC plant were "hard-coded" into IRP modeling, there was little opportunity to examine how the IRA could create savings for Big Rivers' customers through procurement of alternative clean resources. The IRP does not allow for a portfolio that selects from renewable generation, neither to replace the Green units nor to replace generation at Wilson with early retirement nor. This failure leaves potentially millions of dollars on the table that could accrue to the benefit of Big Rivers customers. Worth noting, witness Mathews declared that "we are not building new resources right now," indicating that Big Rivers is failing to test its assumptions and perform the core modeling functions of the IRP.

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89 Summary of Inflation Reduction Act provisions related to renewable energy, EPA, *available at* https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy.

90 *Id.*

91 Hearing transcript at 3:04:09 (Sierra Club cross-exam of Talina R. Mathews).

92 Hearing transcript at 2:56:40 (Sierra Club cross-exam of Talina R. Mathews).

93 Hearing transcript at 3:04:09 (Sierra Club cross-exam of Talina R. Mathews).

94 Hearing transcript at 3:01:39 (Sierra Club cross-exam of Talina R. Mathews).

95 Hearing transcript at 3:02:28 (Sierra Club cross-exam of Talina R. Mathews); *see also* Hearing transcript at 8:29:31 (Earthjustice cross-exam of John Christensen).

Big Rivers is also neglecting its obligation to proactively plan a least cost reliable portfolio by leaving federal financing programs for clean energy entirely out of its IRP. Big Rivers has not given any consideration to the Low-Income Communities Bonus Credit Program[96] and has not explored or sought financing through the Energy Infrastructure Reinvestment[97] or the Rural Energy for America[98] programs. Big Rivers further fails its customers by not taking advantage of energy community tax credit adders under the IRA, which lower the cost of energy investments in mining communities.[99] Witness Mathews conceded that much of Big Rivers territory falls under the definition of "energy community" and that zero-emissions generation projects built in these geographies would qualify for the energy community adder.[100] With the energy community adder, Big Rivers could build or procure renewable energy projects with an ITC of over 50 percent.

Last, Big Rivers, by refusing to consider retiring Wilson or forgoing the proposed NGCC plant has boxed itself into a corner where it cannot take advantage of the Empowering Rural America ("New Era") Program, which provides up to $970 million in funding to lower energy costs and improve health outcomes in rural communities.[101] In September 2023, Big Rivers sent to the Department of Energy a letter of interest to the New Era program to fund a $2.5 billion CCS project, of which the federal government would subsidize $1.48 billion.[102] Big Rivers sent this letter despite the New Era program setting out a clear $970 million cap per grantee, and despite Big Rivers' admissions that its cost estimates for CCS are mostly speculative. Instead of applying for funding for energy storage or solar projects that could provide resilience benefits to rural Kentuckians, Big Rivers indicated it is no longer pursuing New Era program funding.

B. The IRP contains inadequate discussion of key assumptions

Despite a statutory mandate to explain key assumptions, the IRP is rife with locked-in assumptions without anything more than rudimentary explanation of their bases. For example,

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[96] BREC Resp. to Joint Intervenors 1-16.

[97] BREC Resp. to Joint Intervenors 1-14.

[98] BREC Resp. to Joint Intervenors 1-15.

[99] Exhibit SC-2, Energy Communities, *available at* https://energycommunities.gov/energy-community-tax-credit-bonus/.

[100] Hearing transcript at 2:59:30 (Sierra Club cross-exam of Talina R. Mathews); Hearing transcript at 3:00:27 (Sierra Club cross-exam of Talina R. Mathews).

[101] Empowering Rural America New ERA Program, U.S. Department of Agriculture: Rural Development, *available at* https://www.rd.usda.gov/programs-services/electric-programs/empowering-rural-america-new-era-program.

[102] Big Rivers Response to Joint Intervenors Request No. 1-12; Joint Intervenor Comments at 21.

Witness Mathews explained that the decisions to fix Wilson running until its current retirement date and to build the proposed NGCC were already made when she began working on the IRP.[103] To date, Big Rivers have not been able to explain why these major decisions were locked in beyond vague statements about Wilson's reliability. And as detailed above, witnesses acknowledged that there might be lower cost options than keeping Wilson online until 2045, especially given recently adopted GHG rules.

Big Rivers also locked in de minimis demand side energy in its modeled portfolios. In the IRP, the energy efficiency and demand response programs are capped at $1 million in total annual funding.[104] That caps summer peak demand potential at just 16 MWs, around 1 percent of Big Rivers' portfolio.[105] The IRP provides scant explanation for why demand side potential was fixed so low in a planning process meant to explore the potential of emerging resources. Without the IRP evaluating larger demand response portfolios, Big Rivers member-owners will not know whether larger programs targeting energy efficiency and load shifting could more cost-effectively provide load than building out a new NGCC plant, for example. This is particularly concerning given that energy efficiency and demand response are generally accepted as the lowest cost form of energy, with the Commission noting that "every dollar spent on DSM-EE programs returns benefits to customers in excess of a dollar."[106]

C. The IRP does not discuss resource alternatives nor criteria used to screen resource alternatives

Kentucky's IRP rules require Big Rivers to evaluate the benefits, costs, and risks of multiple alternative resource options for its generation portfolio. The IRP rules also require the IRP to include information related to the planned retirements of existing resources. IRP analysis should therefore include an evaluation of various potential retirement dates for older generating resources and consideration of potential cost-effective alternatives that could replace those resources upon

[103] Hearing transcript at 2:05:52 (Earthjustice cross-exam of Talina R. Mathews) (noting that decisions regarding the all-source RFP had already been made by August 2022).
[104] IRP at 83.
[105] IRP at 81.
[106] Case No. 2022-00402, In the Matter of: Electronic Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan and Approval of Fossil Fuel-Fired Generating Unit Retirements, Order at 173 (Ky. P.S.C. Nov. 6, 2023) ("LG&E-KU CPCN Case Nov. 6 2023 Order").

retirement. Witness Mathews acknowledged that this analysis is the base purpose of IRP modeling, i.e. to compare costs of continued operation versus replacement generation assets.[107]

The Big Rivers IRP did not model multiple potential retirement scenarios for Wilson and/or replacement with alternative resources. Big Rivers acknowledges that the IRP did not include any evaluation of retirement scenarios for DB Wilson within the 15-year period covered by the plan. As Chairman Chandler put it, retirement and additions were "hard-coded" in this IRP's modeling.[108] And as witness Mathews confirmed, "Wilson was not allowed to retire in the modeling."[109]

Instead, the IRP simply assumed that DB Wilson would continue to operate until 2045 as currently planned. Big Rivers did not allow modeling to evaluate whether it was more cost-effective to retire DB Wilson before 2045 and replace it with other, lower-cost resources. Big Rivers' failure to conduct this analysis renders the IRP legally inadequate, as it did not include an "assessment of potentially cost-effective resource options available to the utility" relative to Wilson, as required by 807 K.A.R. 5:058 § 8(1). The Commission should require Big Rivers to update the IRP to provide missing alternatives analysis, including multiple alternatives that evaluate the costs and benefits of early retirement within the 15-year plan period.

The IRP also fails to adequately consider alternatives to the proposed NGCC project. The IRP's "base portfolio" calls for construction of a 635 MW NGCC plant in 2029. Of the two alternative portfolios considered in the IRP, one of those–the "aggressive carbon reduction portfolio"– also calls for construction of the same NGCC plant in 2029, as in the base portfolio, while the other "alt. portfolio" instead calls for construction of two combustion turbines with a combined capacity of about 450 MW in 2029 instead of the NGCC. Big Rivers was required to consider multiple alternatives to the NGCC project to determine which alternatives would be lowest-cost and lowest-risk, and to evaluate the reliability impacts of each alternative. Big Rivers severely limited portfolio analysis falls far short of this requirement, as it considered only one alternative portfolio that did not include the NGCC, and that single alternative portfolio sought to replace one gas resource (the NGCC) with another gas resource (two CTs). The IRP did not include any portfolio that considered substituting a non-gas resource (or a portfolio of resources) for the NGCC. Big Rivers' failure to perform this analysis makes it impossible to meaningfully evaluate whether the NGCC project is in the best interests of customers, or whether other generation

[107] Hearing transcript at 3:32:48 (Chairman Chandler cross-exam of Talina R. Mathews).
[108] Hearing transcript at 3:30:42 (Chairman Chandler cross-exam of Talina R. Mathews).
[109] Hearing transcript at 3:30:49 (Chairman Chandler cross-exam of Talina R. Mathews).

portfolios could meet the same needs at lower cost. The Commission should require Big Rivers to update the IRP to remedy this flaw.

Finally, the Big Rivers IRP did not adequately consider the potential role of demand response in its modeling or alternatives analysis. The IRP did include a limited discussion of potential demand response programs, concluding that several of these program options could be cost-effective, including a peak-time rebate (PTR) program, EV charging program, and battery storage program. However, rather than committing to further develop specific demand response programs, the IRP simply stated that Big Rivers would "continue evaluating" such programs. The IRP concluded that "the DSM program is not seen as a viable resource alternative for the Big Rivers fleet," but did not provide adequate analysis to support that conclusion.

Critically, the Big Rivers IRP did not use portfolio modeling to determine the optimal level of demand response programs that should be included in Big Rivers' resource mix. Instead, the Big Rivers IRP improperly limited the role of demand response programs in all resource portfolios it evaluated, capping those programs at a fixed spending level of $1 million. Big Rivers has not provided any valid justification for capping demand response spending at this level. The IRP should have allowed the model to select the optimal level of demand response, and should have included resource portfolios with higher levels of demand response spending. Without such analysis, it is impossible to know whether increased usage of demand response, in combination with other new resources, could be a cost-effective replacement for DB Wilson, Robert D. Green, or other existing resources. The Commission should require Big Rivers to update the IRP to evaluate higher levels of demand response in the IRP's resource portfolios.

D. The IRP does not explain projected efforts to refine analyses

At various stages of the evidentiary hearing, Big Rivers witnesses were confronted with economic, environmental, and other factors unaccounted for in IRP analyses and modeling. Multiple times, witnesses indicated that Big Rivers would take a "fresh" look or engage in a "fresh" start. Yet there was no further explanation beyond a vague promise for strategic discussions to cover analyses left out of the IRP. Ms. Mathews mentioned seven strategic priorities that are governing this "fresh" look, but could not articulate what specific analyses Big Rivers would refine or whether those analyses would be made available to the public or to the PSC. Despite that, Witness Christiansen

indicated he was not aware that the Company was taking a fresh look at IRP analyses but agreed that a "fresh start" would be sensible given the deficiencies in the current IRP.

IV. PSC has the legal authority to reject Big River's IRP and Order an Investigatory Docket Governing Resubmission

Courts have long recognized the "expansive reach of the PSC's authority" to regulate utilities and enforce KRS Chapter 278. *Pub. Serv. Comm'n of Ky. v. Com.*, 320 S.W.3d 660, 665 (Ky. 2010) (citing KRS 278.040(1) and (2)). *See also Smith v. S. Bell Tel. & Tel. Co.,* 268 Ky. 421, 104 S.W.2d 961, 963 (1937). The PSC not only has "exclusive jurisdiction over the regulation of rates and services of utilities,"[110] it may also adopt regulations to implement KRS 278. K.R.S 278.040(3). To that end, the PSC has full power to "investigate the methods and practices of utilities to require them to conform to the laws of this state, and to all reasonable rules, regulations and orders of the commission not contrary to law." *Id.* Beyond the power explicitly granted by the General Assembly, the PSC additionally "has such powers as are conferred expressly or by necessity or fair implication." *Pub. Serv. Comm'n of Ky. v. Com.*, 320 S.W.3d 660, 665 (Ky. 2010) (citing *Boone County Water and Sewer Dist. v. PSC,* 949 S.W.2d 588, 591 (Ky.1997)).

Big Rivers is a utility under K.R.S 278.010(3)(b) and is an exclusive retail electric supplier within its certified territory. *See* K.R.S 278.010(4); 278.010(5); 278.017. As a utility, Big Rivers is obligated to provide adequate, efficient, and reasonable service. KRS 278.030(2). Pursuant to KRS 278.018, the Commission has the authority to determine whether a retail electric supplier is failing or has failed to render adequate service, and upon a finding either is the case, enter an order "that such failure be corrected within a reasonable time, such time to be fixed in such order." KRS 278.108(3).

Part of Big Rivers' obligation to provide adequate service is adequate planning through its IRP. What constitutes planning for reliable and adequate low-cost service has been laid out in Section II above. These requirements include: examining key assumptions, testing key uncertainties, projecting costs, evaluating retirement scenarios, and screening resource alternatives, including demand-side programs, among others. Stepping through Kentucky's IRP requirements, as shown in Section III, reveals that Big Rivers has failed to meet each one. Big Rivers has also plainly failed to meet the most basic IRP requirement, which is to "meet future demand with an adequate and

[110] KRS 278.040(1) and (2).

reliable supply of electricity at the lowest possible cost for all customers." Big Rivers failed to test alternatives to keeping Wilson online until 2045 and alternatives to building a new NGCC plant. It improperly locked in to potentially high costs and low reliability 1,144 MW of its total 1,295 planned capacity (509 MW from Wilson and 635 MW from the NGCC).[111] Further, Big Rivers plainly ignored non-speculative costs, such as environmental compliance costs, and non-speculative savings, such as IRA funding, in its resource planning. There is no way that Big Rivers could state with conviction that they have planned for reliable supply at the lowest possible cost when they closed off the possibility of alternative generation doors and ignored so many costs and potential savings.

Kentucky law provides a remedy for this type of extreme outcome. With its broad authority, the Commission should find that Big Rivers is failing to provide adequate service to its customers through its legally-deficient IRP and order Big Rivers remedy that failure, by opening an investigatory docket into the failed analyses in the IRP and issuing an order requiring resubmission of the IRP with certain analysis and evaluation gaps filled. The Commission has ordered analogous investigatory dockets before, for example in Case 2023-00422*, the Electronic Investigation of Louisville Gas and Electric Company and Kentucky Utilities Company Service Related to Winter Storm Elliott*, which followed Case No. 20220-00402, *Elec. Joint Application of Kentucky Utilities Company And Louisville Gas And Electric Company For Certificates Of Public Convenience And Necessity And Site Compatibility Certificates And Approval Of A Demand Side Management Plan And Approval Of Fossil Fuel-Fired Generating Unit Retirements.*[112] Case No. 2021-00370, *Electronic Investigation of the Service, Rates and Facilities of Kentucky Power Company* is also illustrative.[113] In 2021-00370, it was unclear that Kentucky Power Company had "sufficient capacity to meet maximum estimated customer demand, including sufficient generation capacity," a Kentucky statutory requirement.[114] Similarly, here, it is doubtful that Big Rivers is planning to provide "adequate and reliable supply of electricity at the lowest possible cost for all customers."

V. Conclusion

[111] IRP at 18, 140.
[112] Case No. 2022-00402, *Electronic Joint Application of Kentucky Utilities Company And Louisville Gas And Electric Company For Certificates Of Public Convenience And Necessity And Site Compatibility Certificates And Approval Of A Demand Side Management Plan And Approval Of Fossil Fuel-Fired Generating Unit Retirements* (filed Mar. 10, 2023).
[113] Case No. 2021-00370, Electronic Investigation of the Service, Rates and Facilities of Kentucky Power Company (Ky. PSC June 23, 2023), Order at 7.
[114] *Id.*

Sierra Club appreciates the opportunity to strengthen Big River's integrated resource planning processes and ensure long-term benefits accrue to its member-owners. Sierra Club's examination of IRP regulations reveals that Big Rivers IRP falls short of the major requirements in Kentucky's laws and regulations. We are therefore left with no choice but to recommend that the Commission reject this IRP, open an investigatory docket into Big Rivers' failings in this IRP, and order resubmission of an IRP where Big Rivers evaluates:

a. environmental compliance costs associated with the GHG rule, MATs rule, Good Neighbor Rule, ELG Rule, and CCR Rule (including evaluation of actual CCS costs),
b. earlier retirement and alternative resource scenarios for Wilson (with a requirement to run an optimization model that picks the optimal retirement date and replacement portfolio for Wilson based on expected compliance costs and alternative compliance pathways),
c. alternative resource scenarios for the NGCC plant,
d. uncapped demand response scenarios,
e. maximizing savings from utility-scale investments incentivized by the IRA, and
f. maximizing savings from clean energy financing programs such as the Energy Infrastructure Reinvestment Program, New Era Program, and Rural America Energy Program.

The Commission should finally require that the newly completed IRP integrate the above required analyses and justify its planning and investment decisions in the re-submitted IRP with these analyses. This will ensure that Big Rivers has enough time to pursue the least-cost, reliable option for its customers and avoid any potential roadblocks, such as supply chain or construction lead-time requirements; thus ensuring Big Rivers' member-owners are guaranteed reliable least-cost service.

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