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December 3, 2014

Via Personal Delivery

Mr. Jeff Derouen, Executive Director
Case No. 2014-00166
Kentucky Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

Re: Case No. 2014-00166 Comments on the 2014 Integrated Resource Plan of Big Rivers Electric Corporation (Redacted Version)

Dear Mr. Derouen,

Enclosed, please find ten (10) copies of the redacted version of Sierra Club's Comments on the 2014 Integrated Resource Plan of Big Rivers Electric Corporation, to be filed today in the above-referenced matter via personal delivery. Pages 2, 5, 6, and 11 of the comments and pages 1, 5-13, and 16-21of the attached Synapse Report include redacted confidential information that is subject to petitions for confidential treatment filed in this proceeding by Tyson A. Kamuf on May 15, 2014, September 9, 2014, and October 10, 2014. By copy of this letter, all parties listed on the Certificate of Service have been served via US mail and electronic mail. Please place this document on file.

Sincerely,

Kristin A. Henry

Kristin A. Henry
Senior Attorney
Sierra Club
85 Second Street
San Francisco, CA 94105
Phone: (415) 977-5716
kristin.henry@sierraclub.org

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF: THE 2014 INTEGRATED RESOURCE PLAN OF BIG RIVERS ELECTRIC CORPORATION	: : :	**Case No. 2014-00166**

SIERRA CLUB'S COMMENTS ON THE 2014 INTEGRATED RESOURCE PLAN OF BIG RIVERS ELECTRIC CORPORATION (REDACTED)

Intervenor Sierra Club hereby comments on Big Rivers Electric Corporation's ("Big Rivers" or "Company") 2014 Integrated Resource Plan ("IRP"). Unfortunately, rather than openly and transparently evaluate the range of risks facing the Company and a variety of resource options for minimizing and responding to such risks, Big Rivers' IRP represents little more than an attempt to justify a single resource plan that the Company has been pursuing since at least the first of its two smelter customers announced its intent to leave the system. Such a singular focus fails to satisfy the requirements or purpose of the IRP process, and forecloses the ability of the Commission Staff, Intervenors, and other interested stakeholders to evaluate whether Big Rivers is on the path to achieving a least cost and least risk energy future for its ratepayers.

As discussed below and in the attached report from Synapse Energy Economics ("Synapse Report"), the IRP is a flawed document that fails to satisfy the standards of Kentucky law because, among other things:

- Big Rivers assumed in every scenario the continuation of all of its existing coal units through 2028, rather than evaluating whether retiring, repowering, or selling one or more of those units would be a lower cost/lower risk resource option;[1]
- Big Rivers assumed in every scenario that it would acquire 800 MW of replacement load by between 2019 and 2023, rather than evaluating the likelihood or impact of the Company being able to acquire only a lower level of replacement load;[2]
- Big Rivers overstated the value of its existing generation resources by highly overestimating likely capacity prices;[3]
- Big Rivers unreasonably assumed that coal prices would [redacted]
- Big Rivers failed to evaluate in the IRP options for reducing its carbon emissions and failed to incorporate a carbon price into its base case and most of the scenarios the Company modeled;[5]
- Big Rivers failed to evaluate, much less propose as part of its preferred resource plan, the inclusion of higher levels of energy efficiency that the Company's own consultant has identified as achievable and has estimated could provide between $63 million and $270 million in net benefits.[6]

Until these serious shortcomings in Big Rivers' IRP are remedied, the reasonableness of the Company's future actions relying on this resource planning is suspect. As such, the Commission Staff should find the IRP to be inadequate and require Big Rivers to address each of these

[1] Synapse Report at pp. 1-2.
[2] Synapse Report at pp. 4-6.
[3] Synapse Report at pp. 7-9.
[4] Synapse Report at p. 10.
[5] Synapse Report at pp. 12-15.
[6] Synapse Report at p. 19.

shortcomings in all future resource planning and decision making. In addition, Sierra Club urges the independent management auditor that was recently selected by the Commission to carefully consider and incorporate the findings in these comments and the Synapse Report into its analysis of the Load Concentration Mitigation Plan.

I. IRP Standards

The IRP process in Kentucky is governed by 807 KAR 5:058, which requires Big Rivers to submit every three years a plan that discusses historical and projected demand, resource options for satisfying that demand, and the financial and operating performance of Big Rivers' system.[7] Core elements of the filing include:

- A base load forecast that is "most likely to occur and, to the extent available, alternate forecasts representing lower and upper ranges of expected future growth of the load on its system."[8]
- A "resource assessment and acquisition plan for providing an adequate and reliable supply of electricity to meet forecasted electricity requirements at the lowest possible cost."[9]
- The revenue requirements and average system rates resulting from the plan set forth in the IRP.[10]

As the Commission Staff stated in reviewing Big Rivers' last IRP filing:

> The goal of the Commission in establishing the IRP process was to ensure that all reasonable options for the future supply of electricity were being examined and

[7] 807 KAR 5:058 Section 1(2).
[8] 807 KAR 5:058 Section 7(3).
[9] 807 KAR 5:058 Section 8(1).
[10] 807 KAR 5:058 Section 9.

pursued and that ratepayers were being provided a reliable supply of electricity at the lowest possible cost.[11]

The Staff further explained that, in reviewing an IRP, their goals are to ensure that:

1. All resource options are adequately and fairly evaluated;
2. Critical data, assumptions, and methodologies for all aspects of the plan are adequately documented and are reasonable; and
3. The report includes an incremental component addressing the Staff's findings regarding the utility's previous IRP.[12]

Evaluation of an IRP should also be guided by the overall requirement that utility rates are "fair, just, and reasonable."[13] As the Commission recently explained, it has long been recognized that "'least cost' is one of the fundamental principles utilized when setting rates that are fair, just, and reasonable."[14] A utility's rates will almost certainly not be fair, just, and reasonable if they do not result from planning processes that seek to determine the least cost/least risk resource plan.

II. Big Rivers' Need for Meaningful and Transparent Integrated Resource Planning

While meaningful and transparent integrated resource planning is important to protecting ratepayers of all utilities from unjust and unreasonable electricity costs, it is especially important for Big Rivers given the challenges the Company has faced over the past few years and will continue to face in the foreseeable future. Big Rivers' challenges to date have, of course, stemmed primarily from the decision of the Company's two largest customers – the Hawesville

[11] Kentucky PSC, Staff Report on the 2010 Integrated Resource Plan of Big Rivers Electric Corporation, Case No. 2010-00443 (Dec. 2011), at p. 2 (hereinafter "2010 IRP Staff Report").
[12] *Id.* at 3-4.
[13] KRS § 278.030(1); KRS § 278.040; *Kentucky Public Service Com'n v. Com. ex rel. Conway*, 324 S.W.3d 373, 377 (Ky. 2010).
[14] *In the Matter of: Application of Kentucky Power Co.*, Case No. 2009-00545, 2010 WL 2640998 (Ky. P.S.C. 2010).

and Sebree smelters – to terminate their contracts for the purchase of power from Big Rivers. Those terminations represented a loss of approximately 60% of Big Rivers' load, and left the Company with 800 MW of excess generating capacity.

Big Rivers responded to the smelter contract terminations by implementing what it refers to as a Load Concentration Mitigation Plan, pursuant to which the Company: (1) sought two significant rate increases, (2) plans to add to its system or enter contracts for 800 MW of "replacement load," and (3) proposed to idle the Wilson and Coleman plants for approximately three to five years, and then restart those units once the replacement load has been acquired. The Commission granted only approximately 60% of Big Rivers' proposed rate increases, but the Company is still projecting in its latest load forecast that the effective rate for rural customers will increase from [redacted][15] While Big Rivers has apparently managed to enter into enough forward power sales to at least delay the idling of the Wilson Station,[16] the Company's Coleman Station has been idled since May 2014 with no date certain as to when the plant might return to service. Big Rivers has made numerous attempts to acquire replacement load, but outside of the Wilson forward power sales, the Company has only entered agreements to [redacted] to show for its effort.

The future holds continued challenges for Big Rivers and its generating units. For example, if the Coleman Station were to return to service, the Company estimates that it would

[15] Tab Stmt RUS, line 37, Financial Forecast (2014-2028) 9-15-2014, produced as a Confidential electronic attachment to Big Rivers' response to AG 2-2. The IRP offers a [redacted] It is unclear why these estimates are different than those presented in the financial forecast, including why the financial forecast shows rates [redacted]

[16] IRP at p. 21.

need to make nearly [redacted] in capital expenditures to bring the plant into compliance with the existing Mercury and Air Toxics Standard ("MATS") and Clean Water Act Section 316(b) standards, and the proposed Coal Combustion Waste ("CCW") and Effluent Limitation Guidelines ("ELG") requirements.[17] The R.D. Green plant, meanwhile, faces between [redacted] in capital expenditures needed to achieve compliance with the CCW and ELG requirements along with the Cross State Air Pollution Rule ("CSAPR"), which was recently upheld by the U.S. Supreme Court.[18] And if the Coleman plant were to return to service, Big Rivers acknowledges that it may need to carry out the scrubber upgrade project at Wilson that the 2012 Sargent & Lundy study commissioned by Big Rivers identified as needed to achieve compliance with CSAPR.[19] In addition, given that Big Rivers is the utility with the highest amount of carbon pollution – 2,267 pounds – emitted per megawatt hour ("MWh") of energy produced,[20] it is especially imperative that the Company begin planning now for how it will comply with the U.S. EPA's proposed Clean Power Plan, which is scheduled to be finalized in June 2016. While Big Rivers may claim that it should wait to evaluate compliance with the Clean Power Plan and other regulatory requirements until they are finalized, the Commission Staff has already rejected that argument in the context of Big Rivers' 2010 IRP, stating that "waiting until events are known tends to defeat the purpose of prudent risk analysis and planning."[21]

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[17] IRP at p. 91.
[18] *Id.*
[19] Big Rivers' Response to SC 1-19(c).
[20] Forbes, 5 Dense Carbon Polluters in EPA's Crosshairs (June 1, 2014), available at http://www.forbes.com/sites/jeffmcmahon/2014/06/01/5-dense-carbon-polluters-in-epa-crosshairs/; see also page 3 of the Attachment to Big Rivers' Response to SC 1-23, which reports annual system-wide carbon emission rates ranging from 2,227 to 2,309 pounds per net MWh of energy produced.
[21] 2010 IRP Staff Report at p. 21.

Faced with a substantial loss of load, escalating rates, the idling of a coal plant, and significant environmental regulatory challenges ahead, this is an especially opportune time for Big Rivers to carry out the open and transparent evaluation of risks and resource options for responding to such risks that forms the core of the IRP process. And, in fact, Big Rivers promised as much in its most recent rate increase proceeding, Case No. 2013-00199, in response to claims from intervenors in that proceeding that the Company's long term resource plan of maintaining all of its coal units was flawed and not in the best interest of ratepayers. In particular, Big Rivers' witness John Wolfram submitted rebuttal testimony in the rate case contending that such critiques were "misplaced" because that proceeding was:

> a rate case, not a resource planning case. . . . [T]he IRP process provides a forum in which Big Rivers conducts a thorough assessment of its future load forecasts, demand side alternatives, and supply side alternatives over a fifteen-year planning horizon . . . For these reasons, the IRP process ensures that Big Rivers will review and update its load forecast and resource plans as it is implementing its Mitigation Plan. . . . The IRP filings in 2014, 2017 and 2020, in conjunction with ECP and CPCN filings that are expected to precede the restart of the Coleman and Wilson units in the 2017-2018 timeframe, give the Commission the necessary assurances that Big Rivers will continue to perform the appropriate resource studies on a routine basis. These studies will be conducted in conjunction with the continuing implementation of the Mitigation Plan that the Commission has already given Big Rivers time to pursue. These studies will also provide Big Rivers, the intervenors, and the Commission with additional and on-going insight into the reasonableness

of Big Rivers' resource plans — and thus its rates — over the next three to five years and beyond.[22]

The IRP, however, fails to reveal a "thorough assessment of [Big Rivers'] future load forecasts, demand side alternatives, and supply side alternatives over a fifteen-year planning horizon," or provide "additional and on-going insight into the reasonableness of Big Rivers' resource plans." Instead, the IRP simply presents Big Rivers' preferred resource plan as a given without evaluating any significant alternatives to that plan.[23] As a result, the Company's filing fails to satisfy the basic standards for an IRP set forth in 807 KAR 5:058.

III. Big Rivers' IRP Assumes the Success of the Load Mitigation Plan, Rather Than Evaluating Risks Of and Alternatives to That Plan.

As noted previously, the core purpose of the IRP process is ensuring "that all reasonable options for the future supply of electricity were being examined and pursued and that ratepayers were being provided a reliable supply of electricity at the lowest possible cost."[24] In order to achieve that purpose, an IRP must not be limited to a single resource plan but, instead, must "describe and discuss all options considered for inclusion in the plan," including an assessment of existing generation sources, potential new generation sources, and nonutility generation options.[25] The resource plan must also "consider the potential impacts of selected, key uncertainties and shall include assessment of potentially cost-effective resource options available to the utility."[26] Through such a process, the utility can then determine which potential resource portfolio performs best under a range of potential future conditions so that the utility can develop

[22] Case No. 2013-00199, Rebuttal Testimony of John Wolfram at pp. 8, 10, 14.
[23] Synapse Report at pp. 1-2, 15-16.
[24] 2010 IRP Staff Report at p. 2.
[25] 807 KAR 5:058 Section 8(2).
[26] 807 KAR 5:058 Section 8(1).

a plan that provides "an adequate and reliable supply of electricity to meet forecasted electricity requirements at the lowest possible cost."[27]

Big Rivers, however, did the process exactly backwards in its IRP. Instead of evaluating a number of different potential resource portfolios and testing them under a range of possible future conditions, the Company identified a single resource portfolio and simply assessed the impacts to ratepayers of that resource plan if conditions were mildly different than the Company assumed in its base case. What was never evaluated is whether that single resource portfolio was in the best interest of ratepayers over the 15-year planning period, or whether a different resource portfolio may present a lower cost/lower risk option for ratepayers.

Big Rivers' inadequate approach resulted directly from two fundamentally flawed assumptions in its IRP. First, as described in the attached Synapse Report, the Company assumed in all eighteen of the scenarios that it presented that it would acquire 800 MW of replacement load, with only a minor variation in a few scenarios regarding the year by which such replacement load would be acquired.[28] In other words, in every scenario, Big Rivers assumed that its Load Mitigation Plan would succeed, rather than testing that assumption or evaluating the impacts if the Plan did not succeed. By doing so, the Company failed to satisfy its duty to provide "alternate forecasts representing lower and upper ranges of expected future growth of the load on its system."[29] As the Commission Staff explained in their report on Big Rivers' 2010 IRP, "one purpose of a long-range load forecast's sensitivity analysis is to investigate how a utility will be affected by adverse conditions and then to plan accordingly."[30]

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[27] 807 KAR 5:058 Section 8(1).
[28] Synapse Report at pp. 4-5; see also Big Rivers' Response to SC 1-16(b).
[29] 807 KAR 5:058 Section 7(3).
[30] 2010 IRP Staff Report at p. 21.

Here, however, Big Rivers developed its plan first, and then simply assumed that no adverse conditions would prevent it from achieving that plan.

The second fundamental flaw is that Big Rivers assumed in all eighteen of its scenarios that all four of its coal-fired power plants, which make up the vast majority of Big Rivers' capacity and energy production, would operate for the entire planning period. The Company did not model any scenario in which any of its existing coal units were retired[31] and, in fact, Big Rivers did not even allow its Strategist model to select the option of retiring one or more coal units.[32] Asked why, Big Rivers explained that it did not evaluate or model a coal unit retirement "because there are no plans to retire any generating units in the term of the IRP."[33] But the entire point of an IRP is to evaluate alternative plans and resource options to determine what the least cost/least risk plan would be, not to enter the process with a pre-determined resource plan and not consider any other options.

Big Rivers' approach here was not only inadequate under the IRP requirements, it was imprudent. As noted above, both the Coleman and R.D. Green plants likely face the need for considerable capital investments if they restart or continue to operate as coal plants for more than a couple more years. Any restarting of Coleman would likely increase the necessary compliance costs for the Wilson and R.D. Green plants in order to bring Big Rivers into compliance with CSAPR. And the Company as a whole will likely need to significantly reduce its highest-in-the-nation carbon emission rate in order to comply with the Clean Power Plan and/or other future carbon regulations. A prudent utility would use the IRP process to start planning for these likely costs by, at a minimum, evaluating whether restarting or continuing to operate one or both of those plants is in the ratepayers' best interest, or whether there are other resource options that

[31] Big Rivers' Response to SC 1-16(a).
[32] Big Rivers' Response to SC 2-12(a).
[33] Big Rivers' Response to SC 1-16(g).

Big Rivers should be pursuing. And given that Big Rivers has 800 MW of excess capacity, a prudent utility would openly and transparently evaluate both the likelihood of success and cost of acquiring replacement load for that capacity, in comparison to the option of retiring or selling such excess capacity. Instead of taking such an approach, however, Big Rivers simply swept all of those questions under the rug and presented its desired resource plan as a *fait accompli* in the IRP.

IV. The Fundamental Shortcomings in Big Rivers' Resource Planning Should Be Addressed in the Independent Management Audit.

As demonstrated above and in the Synapse Report, Big Rivers' 2014 IRP is simply the latest example of the fundamentally flawed nature of the Company's resource planning. In response to a significant loss of load and expected major environmental requirements, Big Rivers set itself on a path of keeping all of its coal units for years to come, with little apparent evaluation of alternatives to that approach. When questioned about this plan in the most recent rate increase proceeding, Big Rivers contended that an evaluation of the Company's resource planning was better suited for the IRP process. Now, in the IRP, Big Rivers has again presented only its desired resource plan, and simply assumed both that the 800 MW of replacement load will appear and that keeping all of its coal units is the best option. A few of Big Rivers' responses to data requests belatedly suggest that the Company is [redacted][34] But because such analyses were not included in the IRP, there has been no way for the Commission Staff, intervenors, or other interested stakeholders to review and assess the reasonableness of such analyses or the impacts that the results of those analyses should have on Big Rivers' resource plan.

[34] Synapse Report at pp. 5-6, 16-17.

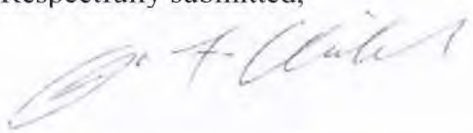
Pursuant to the Commission's order in the most recent Big Rivers rate case, the Company is undergoing an independent management audit focused on analyzing the Mitigation Plan and Big Rivers' implementation of that Plan to date.[35] As part of that analysis, the independent auditor is to "[r]eview and analyze the reasonableness of the utility's Mitigation Plan going forward, including, but not limited to:

- the ability of Big Rivers' coal-fired generating fleet to be competitive and to make sales of capacity and energy in the wholesale markets and offset Big Rivers' fixed costs.
- the potential for the sale or lease of one or more of Big Rivers' coal-fired generating units.
- whether environmental compliance is adequately considered in the Mitigation Plan.
- the potential for debt restructuring and/or refinancing."[36]

Combined, these issues require an assessment of whether the resource plan that Big Rivers' put forward in the IRP as a *fait accompli* is in the best interest of ratepayers, or whether some other option (such as retiring or selling one or more coal units) would be a lower cost/lower risk approach. As such, Sierra Club urges the independent auditor to carefully consider and incorporate the points raised in these comments and the Synapse Report as part of assessing the reasonableness of the Mitigation Plan.

[35] KPSC, Request for Proposal (RFP), Big Rivers Electric Corporation Focused Audit, at p. 9.
[36] *Id.*

Respectfully submitted,



Joe Childers, Esq.
Joe F. Childers & Associates
300 Lexington Building
201 West Short Street
Lexington, Kentucky 40507
859-253-9824
859-258-9288 (facsimile)

Of counsel:

Shannon Fisk
Earthjustice
1617 John F. Kennedy Blvd.
Suite 1675
Philadelphia, PA 19103
(215) 717-4522
sfisk@earthjustice.org

Kristin Henry
Staff Attorney
Sierra Club
85 Second Street
San Francisco, CA 94105
Phone: (415) 977-5716
Fax: (415) 977-5793
kristin.henry@sierraclub.org

Thomas Cmar
Earthjustice
5042 N. Leavitt Street, Suite 1
Chicago, IL 60625
(312) 257-9338
tcmar@earthjustice.org

Dated: December 3, 2014

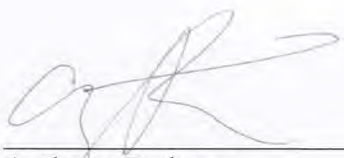
CERTIFICATE OF SERVICE

I certify that I served a copy of Sierra Club's Comments on the 2014 Integrated Resource Plan of Big Rivers Electric Corporation by e-mail and first class mail on December 3, 2014 to the following:

James M. Miller, Esq.
Tyson Kamuf, Esq.
Attorney at Law
Sullivan, Mountjoy, Stainback & Miller, PSC
100 St. Ann Street
P.O. Box 727
Owensboro, KY 42302-0727

Jennifer B Hans, Esq.
Lawrence W. Cook, Esq.
Angela M. Goad, Esq.
Assistant Attorney Generals
Attorney General's Office
1024 Capital Center Drive, Suite 200
Frankfort, KY 40601-8204

Michael L Kurtz, Esq.
Kurt J. Boehm, Esq.
Jody Kyler Cohn, Esq.
Attorney at Law
Boehm, Kurtz & Lowry
36 East Seventh Street
Suite 1510
Cincinnati, OH 45202



Anthony Raduazo
Legal Assistant
Sierra Club

Critical Gaps in the 2014 Big Rivers Integrated Resource Plan

How better planning could be a key to the long term fiscal health of BREC

Prepared for Sierra Club

December 3, 2014

AUTHORS

Joe Daniel
Frank Ackerman

Synapse
Energy Economics, Inc.

485 Massachusetts Avenue, Suite 2
Cambridge, Massachusetts 02139

617.661.3248 | www.synapse-energy.com

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1. SUMMARY

The primary purpose of integrated resource planning (IRP) is to reduce the long term costs to customers by identifying least-cost options and mitigating risks associated with an uncertain future.[1] Big Rivers has misused the IRP process, modeling only minor, often asymmetric sensitivity analyses on its preferred future resource plan. It has assumed success of its greatest hopes, rather than modeling and evaluating a range of realistic alternatives. By doing so it has denied ratepayers and stakeholders the opportunity to understand and evaluate decisions being made by Big Rivers' management.

The Big Rivers 2014 IRP is a credible answer only to the wrong question: Is there any possible scenario under which all of Big Rivers' current capacity would be useful and profitable? The IRP demonstrates at length that there may be one such scenario, and that minor variations on it would produce only minor variations in rates. If everything breaks entirely in Big Rivers' hoped-for direction, then the IRP could be a decent plan for ratepayers. But Big Rivers has tried this approach before, forecasting a favorable future as a way of validating its decision to retain all of its existing capacity, which has resulted in significant and unexpected rate increases and an idled coal plant.

An IRP is supposed to help avoid such situation by openly and transparently evaluating a range of scenarios that assess the impact to ratepayers of potential future conditions and resource options in order to identify a least cost/least risk resource plan. But Big Rivers has not presented such an evaluation; instead, the company has presented its desired resource plan and assessed only minor variations that do not take into account any of the major load and cost risks that Big Rivers faces. The narrowly limited range of sensitivity analyses in the IRP misunderstands the purpose of scenario analysis. Previous analyses which should inform future decisions, namely [redacted] were ignored by BREC in the IRP, and provided only in response to data requests. In addition, capacity prices in the IRP are forecast to [redacted] and energy prices appear to vary widely with each updated BREC calculation.

In short, nothing is said in the IRP to answer the right questions: What are the principal risks and uncertainties facing Big Rivers, and how do they affect the Company's plan for serving its customers? If prices, load growth, and/or environmental regulations turn out less favorably than the company now hopes, would a different resource plan be preferable? Are there circumstances under which the Company's customers would be better off if Big Rivers shed some of its capacity? The IRP provides no basis for evaluating such questions.

In fact, Big Rivers own actions indicate that it does not believe its own IRP. Just a few months after finishing the IRP, the Company adopted a financial forecast built on a scenario that is distinctly more

[1] "Integrated Resource Planning, The Basics and Beyond." James W. Gardner. October, 2013, at p. 6. Available at http://www.naruc.org/international/Documents/GARDNER-%20NARUC%20LMI%20ppt%20IRP%20Gardner.pdf

pessimistic than anything in the IRP. In other words, Big Rivers appears to be undertaking internally at least some of the resource planning evaluations that should have been included as part of an open and transparent IRP process.

Big River's inability to appropriately conduct long term planning will impose unnecessary costs on its members and will only hurt the long-term financial health of the Company. For this reason, it is crucial for the independent management audit to do a thorough and careful evaluation of Big Rivers' resource strategy.

2. OBJECTIVES OF LONG TERM PLANNING

In the 1950s and 60s, the utility industry enjoyed a relatively low-risk environment with reasonably stable load growth and fuel prices. By the 1980s, this was no longer the case. The oil price spikes of the 1970s and nuclear cost overruns from the 1970s and 1980s led many states to call for development of long-term, integrated resource plans (IRP) to help protect consumers and the utility companies.

> The combination of higher oil prices and skyrocketing nuclear construction costs were felt most strongly in New England, and led to the bankruptcy of several utilities – Public Service of New Hampshire, Eastern Utilities, New Hampshire Electric Coop, Eastern Maine Electric Coop, and Vermont Electric Utility Coop. These crises of the 1970s and 1980s caused both utility planners and consumers to examine energy demand and use, resource selection, and risk.[2]

According to the Regulatory Assistance Project, a group of former regulators who provide assistance to policymakers and regulators on energy issues, the primary objective of an IRP is to "minimize the total societal cost of energy production and use over the long-term."[3] PacificCorp (one of the largest utilities in the United States, with service territory in Colorado, Utah, Wyoming, Idaho, Washington, and Oregon) notes that an IRP is not just a document used to fulfill a regulatory obligation but should provide meaningful information to both the company and stakeholders:

> As a business planning tool, [the IRP] supports informed decision-making on resource procurement by providing an analytical framework for assessing resource investment tradeoffs. As an external communications tool, the IRP engages numerous stakeholders in the planning process and guides them through the key decision points leading to PacifiCorp's preferred portfolio of generation, demand-side, and transmission resources. The emphasis of the IRP is to determine the most robust resource plan under a

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[2] "A Brief Survey of State Integrated Resource Planning Rules and Requirements." Rachel Wilson and Paul Peterson. April, 2011. Available here: http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf

[3] "Integrated Resource Planning: History and Principles." Frederick Weston. May 2009. Available here: http://raponline.org/document/download/id/419

reasonably wide range of potential futures as opposed to the optimal plan for some expected view of the future.[4]

Because the future is always uncertain, it is critically important for the long-term planning in IRPs to address a wide range of risks through scenario and sensitivity analysis that evaluate how resource decisions should change in response to such risks. Risks that should be evaluated include changes in fuel prices (coal, oil, and natural gas), future load, electricity market prices, and carbon dioxide and other environmental regulations. And resource decisions that should be considered in response to such risks include not only the pursuit of new generation, but also the potential retirement or sale of existing resource and implementation of energy efficiency and demand response programs that can help mitigate such risks. The IRP process is typically done in the public sphere with opportunities for comment from the public and a review from the Commission. Generally, Commissions can accept or reject the resource plan, and often identify concerns regarding the plan. Commissions have in some cases rejected entire IRPs, or only portions thereof.[5] ().

In Kentucky, the IRP process is established by 807 KAR 5:058. It mandates that utilities evaluate improvements in operating efficiency of existing facilities, demand-side programs, nonutility sources of generation, new power plants, transmission improvements, bulk power purchases and sales, and interconnections with other utilities.[6] When done properly, long-term planning by Kentucky utilities and cooperatives will help these companies maintain a strong financial outlook and serve their customers. As the PSC Staff explain in its Report on the 2010 Big Rivers IRP: "The goal of the Commission in establishing the IRP process was to ensure that all reasonable options for the future supply of electricity were being examined and pursued and that ratepayers were being provided a reliable supply of electricity at the lowest possible cost."[7] Unfortunately, as described below, Big Rivers' IRP entirely fails to achieve that goal.

3. THE USE OF FORECASTING

Developing load and price forecasts is one of the most important parts of the IRP process. Utilities in Kentucky are required to include a base load forecast that is "most likely to occur and, to the extent

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[4] "2007 Integrated Resource Plan: Pacific Power, Rocky Mountain Power, PacifiCorp Energy" ParcifiCorp. 2007. Available here: http://www.psc.state.ky.us/PSCSCF/2007%20cases/2007-00477/OCI%20Workpapers%20II/Pacificorp%20IRP.pdf

[5] In re: Public Utilities Comm. Integrated Resource Planning, Docket No., 2012-0036, Order No. 32052 avaialbe at http://dms.puc.hawaii.gov/dms/OpenDocServlet?RT=&document_id=91+3+ICM4+LSDB15+PC_DocketReport59+26+A1001001A14D29A91612I8285218+A14D29B10740E600721+14+1960

[6] Kentucky Administrative Regulation 807 KAR 5:058: Integrated resource planning by electric utilities. Available at: http://www.lrc.ky.gov/kar/807/005/058.htm

[7] "Staff Report on the 2010 Integrated Resource Plan of Big Rivers Electric Corporation." Case No. 2010-00443. December 2011. Available here: http://psc.ky.gov/agencies/psc/industry/electric/irp/201000443_122011.pdf

available, alternate forecasts representing lower and upper ranges of expected future growth of the load on its system."[8] The use of unrealistic forecasts was a major issue in Big Rivers' two recent rate cases. In this IRP, the forecasts used as modeling inputs are not only unrealistic, but appear to be developed primarily on the basis of an overly optimistic future – on what the company hopes will come to fruition, rather than careful evaluation of what is likely to come about.

3.1. 800 MW of replacement load

Replacement load of 800 MW is roughly what is needed to support all of Big Rivers' capacity, in the absence of the smelters. In the IRP base case, Big Rivers assumes that 800 MW of replacement load will be available by 2021. This represents a near doubling of the Company's current load. Sensitivity analyses explore only the possibilities that the 800 MW target will be reached two years earlier or later, either by 2019 or not until 2023 (IRP, p.54). The IRP does not include an evaluation of any scenario in which less than 800MW of replacement load is obtained. In other words, the IRP assumes that Big Rivers' load mitigation plan will succeed in replacing virtually all the load lost when the two smelters left the system, rather than also evaluating the risks and impacts if the Company can only achieve a lower level of replacement load.

Explaining the scenario process, the IRP says that:

> In addition to the base case forecast, Big Rivers prepared forecast scenarios to evaluate the impacts of varying economic conditions, market price sensitivities, fuel price sensitivities, weather conditions, and potential environmental regulations. Key model inputs were adjusted in developing the economy, market, fuel, weather, and environmental regulation scenarios and were set to values that Big Rivers believes would be similar to the 95% and 5% points of their respective probability distributions. (IRP Appendix C, p.C-2)

Taken literally, this suggests that the company has 90 percent confidence that it will reach 800 MW of replacement load at some point between 2019 and 2023 – and that there is only a 5 percent chance of failing to reach the 800 MW level by 2023. Figure 1 shows the narrow range of assumptions about future load growth in the IRP load forecasts. Every one of the 18 scenarios in the IRP assumes 800MW of replacement load will be achieved between 2019 and 2023 and as a result, the company has only investigated a limited range of possible outcomes. While other utilities are investigating the impacts of no load growth, or even load reduction, Big Rivers seems stuck in the past, relying on a future with a near doubling of load in every single model run.

[8] 807 K.A.R. 5:058 Section 7(3)

[redacted]

Replacement load of 800 MW is roughly what is needed to support all of Big Rivers' capacity, in the absence of the smelters. But is it plausible, in a market environment in which many other utilities are also scrambling to find new load for their excess capacity? According to Big Rivers' limited analysis, the answer is, in effect, trust us, we'll find it. The 2014 IRP states that, "With current market price projections, Big Rivers currently anticipates it may be cost effective to return idled plants [to service] in 2016 or 2017."[9] But the expectation of securing long term contracts for large amounts of additional load runs counter to BREC's experience and to current market trends. Recently, "[n]ine municipal power providers... have threatened to bolt from Kentucky Utilities Co., saying they believe they can get a more flexible electricity contract and save money on the open market."[10] Utilities in the region are not just losing customers to the market; some customers are vanishing entirely, including the large industrial load from the USEC uranium enrichment facility in Paducah, KY which shut down last year.[11]

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[9] Big Rivers Electric Corporation Integrated Resource Plan. May 15, 2014. Page 113

[10] "Nine Cities threaten defection from Kentucky Utilities." James Bruggers. *The Courier-Journal*. May 14, 2014. Available at: http://www.courier-journal.com/story/tech/science/environment/2014/05/14/lge-ku-energy-munciple-power-contracts/2140012/

[11] "Kentucky Operator to Cease Enrichment of Uranium." Mathew L. Wald. *The New York Times*. May 24, 2013. Available at: http://www.nytimes.com/2013/05/25/business/usec-to-shut-uranium-enrichment-plant-in-kentucky.html?_r=0

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] By failing to include a 400MW replacement load scenario (or any other meaningfully different load scenario) in the IRP, Big Rivers has foreclosed the Staff and Intervenors from evaluating whether such scenario is more likely and whether it would be better for ratepayers for Big Rivers to pursue a resource plan that assumed such lower level of replacement load. As such, it is critically important that the independent management audit carefully evaluate a 400MW replacement load forecast and other reasonable load forecast scenarios that Big Rivers failed to include in its IRP.

Even if one were to accept Big Rivers' optimistic load forecasts, the rates being charged to different customer classes should be carefully examined. Figure 2 contrasts Big Rivers' projected rates that will be charged to rural, large industrial, and replacement load customers. If these projections come true, [redacted]

Figure 2. [redacted]

3.2. Capacity market

Big Rivers is forecasting capacity prices that appear to exceed reasonable expectations for the MISO capacity market. MISO operates a one-year-ahead capacity auction that determines capacity payments. MISO also calculates a "cost of new entry" (CONE) price for each of the nine Local Resource Zones (LRZs). CONE is the price that the system operator expects that new capacity resources would need in order to remain financially solvent based on capacity market revenues alone. MISO LRZ 4, which includes the three states that border Big Rivers' territory, is the most representative locational resource zone for Big Rivers. MISO has estimated that the LRZ 4 cost of new entry (CONE) is roughly $89,000/MW-yr.[12] Net CONE, the amount a new resource would need minus the revenues that that resource could expect in the energy market, is generally 15-20% less than gross CONE.[13] Based on a 16% mark down of gross CONE, Synapse estimates that net CONE in LRZ 4 is just shy of $75,000/MW-yr.[14]

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[12] "Re: Filing of Midcontinent Independent System Operator, Inc. Regarding LRZ CONE Calculation; FERC Docket No. ER13-____-000" Michael L. Kessler. Septermber, 2013. Available here: https://www.misoenergy.org/Library/Repository/Tariff/FERC%20Filings/LRZ%20CONE%20Filing_3%20Sept%202013.pdf

[13] PJM Planning Period Parameters 2017-2018 Available here: http://pjm.com/~/media/markets-ops/rpm/rpm-auction-info/2017-2018-planning-period-parameters.ashx

[14] Based on the average ratio of gross to net CONE in the PJM Planning Period Parameters 2017-2018. Available here: http://pjm.com/~/media/markets-ops/rpm/rpm-auction-info/2017-2018-planning-period-parameters.ashx

Historically, the MISO capacity market price has been held down by excess existing capacity; until the 2015/2016 auction it remained below $1,000/MW-yr. The 2015/2016 clearing price "skyrocketed" to $6,000/MW-yr (still far below net CONE). Capacity prices have consistently been higher in the market run by MISO's eastern neighbor, PJM – but the PJM capacity market clears at an average price of 55% of PJM's CONE.[15]

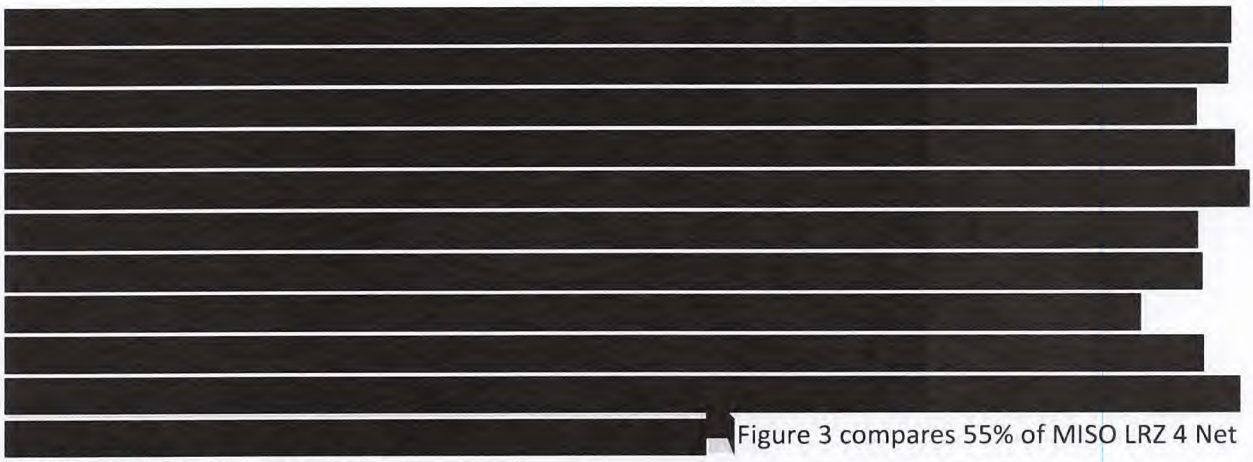

Figure 3 compares 55% of MISO LRZ 4 Net CONE to the Big Rivers Forecast.

[15] Direct Testimony of R. Hornby, Case No. 11-1775-E-P PSC of West Virginia. July, 2013. Pg 21. Available at http://www.synapse-energy.com/sites/default/files/SynapseTestimony.2013-07.WV-CAD.APCo-WPCo-Generation-Transaction.13-030.pdf

[16] Fine, S., A. Saraf, K. Kumarawamy, A. Anich. "The True Value of Solar." ICF White Paper. October, 2014. Available at http://www.icfi.com/insights/white-papers/2014/true-value-of-solar

Figure 3 [redacted]

[redacted]

Based on historic data and economic theory, the Big Rivers forecast is above and beyond a reasonable upper bound. Yet the IRP presents this forecast as a "base case" and suggests that there is even a possibility of capacity revenues exceeding the base case by [redacted][17] That scenario implies a capacity price that is consistently higher than gross CONE, an unrealistic expectation. For the purposes of planning, it would be far more reasonable to use 55% of net CONE as a base case estimate for the capacity price.

Big Rivers uses the capacity market forecast to adjust the costs of each of the scenarios. They do so by multiplying the Company's available capacity in each year by the forecasted market price, resulting in a projected revenue stream from capacity sales. The Net Present Value (NPV) of this revenue stream is calculated using a [redacted] discount rate (see the spreadsheet attachment to the BREC Response to SC 1-15c). Changing the capacity price forecast to 55% of net CONE would reduce the NPV of capacity market revenues by roughly half. For the base case, this adjustment reduces capacity market revenues from [redacted] million to [redacted] million.

Big Rivers' basis for its capacity price assumption is that large amounts of coal capacity will soon retire due to the costs of compliance with MATS, 111(d) and other EPA regulations. If this happens, and if no one else were to adopt the same strategy, then Big Rivers might indeed enjoy increased capacity revenues. It seems reasonable to assume, however, that other owners of coal plants will pursue the

[17] Big Rivers Electric Corporation Integrated Resource Plan. May 15, 2014. Appendix H

same strategy, hanging onto otherwise unprofitable plants in hopes of a capacity market windfall. If that happens, the price for capacity will be lower than every utility had hoped. The result could be a multi-state game of chicken, as every utility waits for others to retire their uneconomic units, finally allowing the price to rise for the remaining plants. Big Rivers does not have the financial resources to win such a game, outwaiting other utilities; some of its competitors have much stronger balance sheets, and have already invested more in compliance with CSAPR and other environmental regulations.

3.3. Coal Prices

The Big Rivers IRP not only relies on unrealistically favorable market prices for revenue calculations, it also uses unrealistically favorable market prices for fuel costs, mainly coal. In real terms, Big Rivers is [redacted] Meanwhile, EIA's Annual Energy Outlook (AEO) 2014, has both minemouth and delivered coal prices steadily increasing over the BREC planning horizon; see Figure 4. If Big Rivers had utilized a more realistic coal price forecast, the IRP modeling and analysis would have shown higher rates for the members, lower off-system sales, and a reduction in the dispatch of BREC's coal plants. Or, the use of a more realistic coal price forecast could have led to the identification of different resource plans that would help avoid those impacts.

Figure 4. [redacted]

3.4. Energy market

Big River's forecast for energy market prices seems to change with every inquiry. The IRP provides the Wood Mackenzie equilibrium price forecast. In response to data request SC 1-25, BREC provides a PCM run with a different forecast. A third and altogether different forecast was presented in the PCM run provided in response to data request AG 1-7, which was used to develop the latest financial forecast as provided in response to data request AG 2-2. Although these price forecasts are not comparable in absolute terms because they represent weighted averages of either sales, purchases, or the overall market, one would expect them to display similar overall trends over time. That is not the case; the significant differences among these forecasts, shown in Figure 5, are a challenge to explain.

Figure 5. [redacted]

It is also troubling that the Wood Mackenzie energy price forecast which Big Rivers is relying on may in fact result in a double counting of capacity price revenues. According to BREC response to SC 1-31, BREC uses Wood Mackenzie equilibrium prices, which are calculated by a model which

> ...produces three layers of prices: short run marginal cost prices which represent the production cost of the marginal MW, the scarcity premium above short run marginal cost that generators can expect to receive in the energy market that covers fixed costs and bid mark-ups, and the capacity price required for new market entry.

This suggests that the Wood Mackenzie long term price may already include capacity prices, which BREC calculates and adds in separately. If BREC revenues are based on a long term energy price forecast plus capacity revenues, then BREC may be double counting capacity market payments. Without access to the three layers of prices and an explanation of how they are used to generate the equilibrium price, it is impossible to be sure about this.

3.5. Carbon Price

There are several co-existing meanings for the term "carbon price" or "CO_2 price": it might be describing carbon allowances, a carbon tax, the social cost of carbon, a carbon shadow price, or some other carbon cost. Each of these terms is appropriate in its own context. Complex models that are used for long-term planning, including the model used by BREC, are capable of modeling carbon allowances or a carbon tax;

more simplistic financial models cannot easily represent carbon allowances, so a carbon tax or shadow price is more appropriate to use. In either case, there are a number of regulations that mandate a reduction in greenhouse gas emissions in the power sector, either directly or indirectly.[18] And with EPA having proposed its Clean Power Plan (a development that was well advertised in advance, before the completion of the Big Rivers IRP), it is imprudent to omit a carbon price in long-term modeling.

Big Rivers does not completely ignore the fact that a carbon price of some sort is likely to be adopted at some point in the future. Big Rivers does use the model to cost out the impact of carbon regulation; however, the company fails to appropriately use a carbon forecast in several ways.

Big Rivers' most egregious failure with respect to carbon prices is that it did not use the IRP to evaluate resource plans that could mitigate the costs of carbon regulations to BREC customers. Since Big Rivers did not allow its model to choose the retirement of any existing resource, and did not assume any retirement scenarios, there has not been any evaluation of options for reducing future carbon costs.[19] With the same amount of coal capacity operating in every scenario, there is almost no variation between scenarios in the amount of carbon emissions.

Another apparent failure is the use of a base case energy price forecast that [redacted] It is difficult to evaluate this error in any detail due to the extreme lack of transparency regarding forecasts: when projections from consulting firms are presented as confidential information, without supporting documentation or detailed explanation, PSC staff, auditors and intervenors are forced to take the Company's word for the reasonableness of the forecasts. However, in the response to data request SC 2-14, Big Rivers said that [redacted] – although no information was provided that allows independent confirmation of this potential error.

Moreover, the company fails to include a carbon forecast in the majority of its analyses. The 2013 Synapse paper that the Company cites is one of many sources suggesting that at this point, companies should be including a carbon price in all of their forecasts. U.S. electric utilities and other entities are increasingly incorporating CO_2 price projections into long-term planning and decision making process. In the words of another commentator:

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[18] CO2 Price Report, Spring 2014. Patrick Luckow et. al. May 2014. Available here: http://www.synapse-energy.com/sites/default/files/SynapseReport.2014-05.0.CO2-Price-Report-Spring-2014.14-039.pdf

[19] BREC Response to SC 1-16(a),(g) and SC 1-34 Case No. 2014-00166

> The utility Integrated Resource Plans (IRPs) required by many states make it necessary to project future prices for fuel and electricity. The substantial uncertainties in these price forecasts are understood, and are accepted as part of the process of making the best possible predictions given current information. Forecasting a CO_2 price is a similar exercise. Given the current regulatory environment, many utilities have come to recognize that making the assumption that there will be no CO_2 price is unrealistic and may lead to significant unexpected future costs.[20]

An ongoing review by Synapse of recent IRPs found that 39 utilities, representing 42 states and a substantial fraction of total U.S. generation, use CO_2 forecasts in their reference case (also sometimes called a base case or business as usual case).[21] Big Rivers' decision not to include a CO_2 price in the Company's base case prevents them from being able to properly mitigate risk. This type of planning can lead to unnecessary, unanticipated costs which its rural customers cannot afford, and its industrial customers will not willingly accept. The carbon prices incorporated in selected utility forecasts, over the same time frame covered in the Big Rivers 2014 IRP, are shown in Figure 6. These are forecasts used in utility base cases, where Big Rivers is assuming that there will be no cost of carbon emissions.

The Company's decision to neither allow the model to reduce carbon emissions by retiring coal plants nor to include a reasonable CO_2 price in most of their modeling runs will ultimately result in endorsement of resource choices that are not in the best interest of its members or in the interest of the long term financial health of the company. Delaying action to reduce CO_2 emissions only makes future emissions mitigation more costly.[22]

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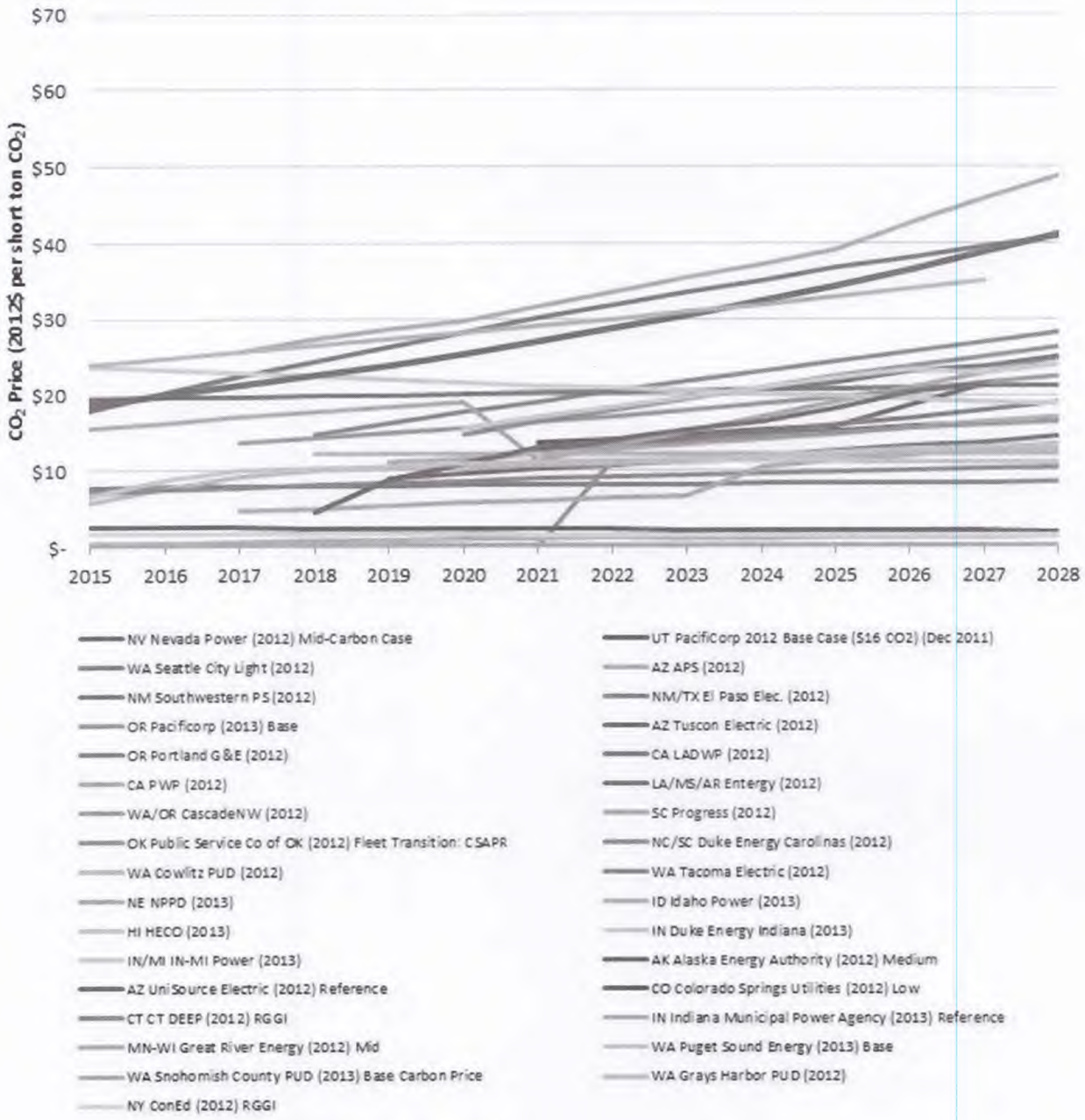
[20] Luckow, P., J. Daniel, S. Fields, E. A. Stanton, B. Biewald. 2014. "CO2 Price Forecast: Planning for Future Environmental Regulations." EM Magazine, June 2014, 57-59.

[21] Biewald, B. Written Statement of Bruce Biewald. Submitted as part of the February 27, 2014, U.S. Subcommittee on Energy and Power hearing: "Benefits of and Challenges to Energy Access in the 21st Century: Electricity;" February 2014

[22] Clarke, L.; Edmonds, J.; Krey, V.; Richels, R.; Rose, S.; Tavoni, M. International Climate Policy Architectures: Overview of the EMF 22 International Scenarios; Energy Economics 2009, 31 (Suppl. 2), S64-S81.

Figure 6. Sampling of CO_2 Price Forecasts used in Base Case IRP scenarios



Source: Various. Assembled by Synapse Energy Economics.

Note: Dates shown are from 2015-20028 to reflect the same time horizon as the Big Rivers IRP, many of these forecast extend beyond this date range.

4. USING SCENARIOS AND SENSITIVITIES

Developing scenarios and testing how a resource plan performs under various sensitivities is a basic part of long term planning. Ideally, multiple potential plans should be developed and tested under a range of sensitivities. The plans that perform best under multiple likely scenarios should be selected for additional sensitivity analysis. While utilities select plans on a wide range of metrics, generally the preferred plan performs well under numerous different sensitivity analyses. Most importantly, each of the scenarios developed should be realistic, and reflect reasonable assumptions about load, market prices, and environmental regulations in a plausible future.

Big Rivers, however, decided on its resource plan before starting the IRP process, rather than evaluating a range of resource options under a reasonable range of projected future conditions. The Company did not present any scenario in which it evaluated retiring one or more coal units, and did not allow the model to select retirement as an option.[23] And while BREC is actively seeking to sell or idle some of the Company's generating units, any analyses that reflect those courses of actions are omitted from the IRP. The result of this omission is that every resource portfolio discussed in the IRP is nearly identical; at most, a few have minor changes or additions in the later years. (The sole exception is the renewable energy mandate scenario, in which significant new renewable capacity is assumed to be required by law.) Nearly every one of the 18 scenarios presented in the IRP is deeply flawed; individually and collectively, these scenarios fail to represent what the future may hold for Big Rivers and its members, under any but the most optimistic assumptions.

Of the 18 scenarios only two include the costs associated with known environmental regulations which Big Rivers has assessed, while two others include a cost of carbon emissions (resulting from regulations such as the proposed Clean Power Plan); none of the scenarios include both compliance with known environmental regulations and a price on carbon emissions. Omitting or fragmenting these costs, which total in the [redacted], makes it impossible to draw meaningful conclusions by comparing scenarios. The IRP identifies [redacted] This should lead to questions and analysis about the merits of retirement versus retrofitting of these aging plants. Meanwhile, all 18 scenarios achieve exactly 800 MW of replacement load, differing only slightly in timing; this makes the IRP useless in determining the costs associated with not meeting the replacement load target, developing a plan to mitigate those costs, or evaluating whether attempting to replace all of the lost smelter load in order to keep all of Big Rivers' coal capacity operating is in the best interest of ratepayers.

In the IRP process, Big Rivers modeled several scenarios, most defined as sensitivity analyses varying a single assumption in the base case. The scenarios are largely presented as things that might happen to

[23] BREC Response to SC 1-16(a),(g) and SC 1-34 Case No. 2014-00166

BREC (better or worse weather, economic growth, market prices, etc.), not different cost mitigation strategies that BREC might choose to explore. The scenarios are examined only one at a time, as if multiple deviations from the company's base case are not conceivable. Essentially nothing is said about why these particular scenarios represent the 5th and 95th percentiles on the relevant probability distribution (see above). In the case of load forecasts, capacity price forecasts, and perhaps others, it is very difficult to believe that Big Rivers has correctly identified the 5th and 95th percentiles of possible outcomes, since it has excluded any consideration of partial success in finding replacement load, or capacity prices that remain in line with historical experience.

5. VALUE OF ASSETS

The IRP process is a powerful tool that can help guide utilities to take appropriate actions. This process is aided when utilities use previous reports and analysis to inform the new, long term planning. However, it is apparent that BREC has ignored an important prior analysis that they themselves had commissioned.

Big Rivers has [redacted]. According to the Company, Big Rivers has not performed any net present value revenue requirement analysis of potential future operation of Coleman Station.[24] [redacted]

In 2013, at Big Rivers' request, [redacted]

[redacted]

[redacted]

[24] BREC Response to SC 1-12 Case No. 2014-00166

[redacted]

[redacted]

[redacted] As in other aspects of the IRP, BREC's plans look reasonable only under the most optimistic assumptions. [redacted]

[redacted] These analyses, which were carried out before the IRP was filed, demonstrate even further why Big Rivers should have openly and transparently evaluated in its IRP scenarios in which one or more of its coal units is retired, rather than assuming that all of its coal units would continue for the entire planning period no matter what the future may hold.

6. DISCONNECTS BETWEEN PLANNING AND PLAN

At the end of an IRP, utilities should have a clear path forward that includes a list of action items that the company plans on pursuing. This would include short-term, mid-term, and long-term plans, like increasing the budget of the following year's energy efficiency program, signing a Power Purchase Agreement with a wind developer, construction of a new plant, or decommissioning an old plant that is no longer necessary. While these plans are not set in stone, significant changes in market conditions or regulations may mean that the action plan varies from the previous IRP. However, the action plan

(sometimes referred to as the preferred plan) should reflect a portfolio that was chosen because it was tested under a range of scenarios, and performed well enough that it is not likely to require significant changes in the short term.

Big Rivers seems to have used the IRP to analyze options they have no plan to pursue (such as increased energy efficiency, explained below), while simultaneously not analyzing options they may plan on pursing [redacted] This prevents the long-term "integrated resource plan" from being either integrated or a plan. The IRP focused on a single portfolio that BREC management predetermined to be optimal, and tested it under a myriad of unlikely futures. It is no surprise that the Company's current plans do not match up with the IRP results.

6.1. Energy Efficiency Plan

The company's action plan in the IRP states that, "The proposed actions over the next 3 years are in line with continued efforts to implement the Mitigation Plan filed in Big Rivers' 2012 Environmental Compliance Plan case, Case No. 2012-0063, as well as a continued focus on DSM programs."[25] This statement runs counter to the Company's declared actions since the release of the IRP in May. As shown above, the Company has already significantly deviated from the "Mitigation Plan" with its most recent long term financial plan. And despite a claim that it is focusing on demand side management (DSM) programs, they are forgoing opportunities for additional member savings by not pursuing the more aggressive energy efficiency (EE) plan it modeled during the IRP process. Big Rivers commissioned an Energy Efficiency Potential study which identified the potential for $270 million in net benefits, which Big Rivers is not pursuing. The study also identified a "$2 million" energy efficiency program that would yield $63 million in net benefits, which the Company is choosing to not pursue. Instead, the Company has chosen to pursue the energy efficiency program with the least amount of net benefits among the options it considered. At less than $32 million in net benefits, the "$1 million" program is expected to yield half the net benefits of the $2 million program.

Table 1. Energy Efficiency Potential Study Results

Benefit-Cost Ratios by Scenario Estimated by the Energy Efficiency Potential Study

Scenarios	*NPV $ Benefits*	*NPV $ Costs*	*Benefit/Cost Ratio*	*Net Benefits*
Achievable Potential	*$506,791,256*	*$236,486,056*	*2.14*	*$270,305,200*
Program ($ 2 million)	*$114,112,784*	*$50,901,486*	*2.24*	*$63,211,298*
Program ($ 1 million)	*$56,970,960*	*$25,432,384*	*2.24*	*$31,538,576*

Source: Big Rivers Electric Corporation Integrated Resource Plan. May 15, 2014. Table 5.2

[25] Big Rivers Electric Corporation Integrated Resource Plan. May 15, 2014. Page 113

6.2. Resource Portfolios

All of the resource portfolios analyzed are nearly identical. While some of the plans would require small additions of capacity (50 MW) in future years, the plans all include massive amounts of replacement load, so that BREC can supply both members and the market with coal-fired electricity. The problem with this approach is that it fails to address or analyze options for a lower cost, risk resilient portfolio that may (or may not) include retiring, idling, or fuel switching various coal units. The company claims that it decided not to model any of the Company's generating units being retired "because there are no plans to retire any generating units in the term of the IRP."[26] However, the purpose of an IRP should be (among other things) to determine whether the Company should plan on retiring any units. Modeling scenarios with and without different generating units is how a prudent utility would determine if a generating resource should be kept on line. However, BREC management circumvented this entire critical step by predetermining to not retire any of their current generating units.

As discussed above, the Company has apparently been considering [redacted] yet this possibility is never mentioned in the IRP. The Company has also been considering [redacted] The IRP would have been the appropriate forum to analyze whether [redacted] would benefit ratepayers. Gas conversion analysis is omitted from the IRP, with only a passing mention (on p. 92 of the IRP) that the company is considering some unspecified amount of conversion to natural gas [redacted] Apparently this analysis of natural gas conversion [redacted] took place in a separate conversation about real resource plans for Big Rivers, not in the "everything's coming up roses" version presented in the IRP.

7. RECOMMENDATIONS

In general, the company constrained its scenario modeling in a manner that prevents the company, the Commission, and other stakeholders from gleaning any meaningful information from the model runs. In responses to inquires about options it chose not to model, Big Rivers repeatedly responded that it did not model options it did not plan to pursue. Inconsistencies between the IRP and other Company documents regarding [redacted] represent significant gaps between the Company's stated plans and the planning process. All of these items are examples of paths the Company is actually exploring but chose not to model or discuss in the IRP.

Alternatively, the Company should have allowed the IRP process and modeling results to inform its Company plans; however that was not the case. In at least one case, the Company chose to analyze a

[26] BREC response to SC1-16 in case 2014-00166

planning option it had no plan to pursue: an energy efficiency plan costing more than $1 million. The Company's decision to not pursue a $2 million EE program (despite the fact that it results in a greater increase in savings than in costs) confirms that the IRP did not serve the purpose of long-term planning. This is indicative of extremely poor planning because the modeling results should inform and support the Company's resource planning process – not the other way around.

There is a stark disconnect between the modeling results and data responses on the one hand, and the IRP text and the path that BREC is pursuing on the other hand. Modeling the impacts of [redacted] as BREC apparently now does for financial forecasting purposes, could provide valuable insights to not only BREC itself, but also its customers, the PSC and other stakeholders. So, too, could modeling of more realistic energy and capacity prices, [redacted]. Even taking seriously its own results on EE – showing that a more ambitious EE scenario creates greater savings – would have led to improvements in Company resource planning.

This IRP sheds surprisingly little light on the risks and opportunities facing Big Rivers. Once again, the Company has merely shown that all of its assets may be needed if everything goes its way in energy, capacity, fuel, and replacement load markets. Useful planning requires facing the music, admitting that utilities have to make decisions in a complex, risky economic environment, under conditions not of their own choosing. Prior to the IRP process, BREC had completed significant and important analyses that never made its way into the IRP. Furthermore, the Company seemed to ignore the analysis of its own consultants and failed to model many of the Company's own stated plans. Not only did the Company decide not to make plans to react to the results of prior analysis; responses during the IRP process suggest that even considering any such plans (like not meeting replacement load goals) would be ridiculous. However, in analysis done after the initial IRP modeling, the Company appears to be considering many of those previously inconceivable plans – though not all, since more ambitious EE plans with their greater savings are still ruled out. These issues should all be addressed carefully in the independent management audit.

In the past, Big Rivers has argued that it must keep all its plants in service because they are pledged as collateral on its loans; retiring any one of them would allegedly risk default. The constraint of Big Rivers' substantial debt burden should be recognized and analyzed explicitly; what is the minimum revenue requirement compatible with repayment of debts and provision of service to the members? It seems entirely possible, as was suggested in the latest rate case, that retirement of one or more plants, combined with a clear statement from the Commission that Big Rivers will be allowed sufficient revenue to meet its interest payments, would be the least-cost path forward under many future scenarios. But we will not know for sure until a more reasonable long-range planning exercise occurs.