Gloria D. Smith
Managing Attorney
Sierra Club Environmental Law Program
2101 Webster Street, Suite 1300
Oakland, CA 94612
(415) 977-5532
gloria.smith@sierraclub.org

BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

In the Matter of PACIFICORP, dba PACIFIC POWER, 2019 Integrated Resource Plan	Docket LC 70

SIERRA CLUB'S COMMENTS ON PACIFICORP STACKED COAL RETIREMNT ANALYSES

TABLE OF CONTENTS

BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

In the Matter of PACIFICORP, dba PACIFIC POWER, 2019 Integrated Resource Plan	Docket LC 70

SIERRA CLUB COMMENTS ON PACIFICORP STACKED COAL RETIREMENT ANALYSES

1. INTRODUCTION AND SUMMARY

At a stakeholder meeting on April 25, 2019, PacifiCorp presented updated results of its economic analyses of alternative retirement dates for its existing coal units ("April Analysis").[1] These latest results focused on "stacked" retirement analyses in which PacifiCorp assessed the relative performance of resource portfolios in which various combinations of PacifiCorp coal units are assumed to retire in the near term. These comments provide Sierra Club's input regarding the appropriateness of the analyses and results presented at the April stakeholder meeting, request clarification regarding certain analytical decisions, and propose next steps. They were prepared with technical assistance from Synapse Energy Economics.

Sierra Club continues to appreciate the effort PacifiCorp has put into conducting coal economic analyses as part of this Integrated Resource Plan (IRP) process. However, Sierra Club remains concerned about some elements of PacifiCorp's latest analyses and presentations. Sierra Club therefore offers the following comments and recommendations:

1. **PacifiCorp must evaluate a more reasonable range of stacked retirement scenarios.** Some of PacifiCorp's least economic units, including Hayden Unit 2 and Craig Unit 1, were not meaningfully included in the stacked retirement analyses. Others, including Bridger Units 3 and 4, were not evaluated at all. Contrary to PacifiCorp's claims, the Company's updated Benchmark Case assumptions have substantially changed its findings regarding the relative economics of its coal units. PacifiCorp's stacked retirement analyses must account for those updated unit-specific findings.

[1] PacifiCorp. 2019 Integrated Resource Plan (IRP) Public Input Meeting April 25, 2019. [Hereinafter "April Presentation"].

2. **PacifiCorp has not sufficiently justified its methodology for including "reliability resources" in its resource portfolios.** PacifiCorp's approach appears to require an arbitrarily large quantity of "reliability resources" and does not account for the relative ability of various resource types to provide reliability services. Sierra Club recommends that this methodology not be relied upon for any near-term resource build decisions.

3. **PacifiCorp's modeling appears to incorporate unsupported and favorable assumptions regarding its Jim Bridger coal units.** PacifiCorp's Bridger coal price assumptions appear to be optimistically low. In addition, the Company's planned regional haze scenario analyses may assume unlikely regulatory compliance options at the Bridger plant. PacifiCorp should more fully explain and support these assumptions. PacifiCorp should also evaluate additional coal retirement portfolios if it substantially changes its baseline regulatory compliance cost assumptions for the Bridger plant.

4. **PacifiCorp's IRP analyses and decisions should protect non-Wyoming ratepayers from Wyoming legislation that may delay the retirement of uneconomic coal units.** One way to do this may be through modeling Wyoming separately from the rest of PacifiCorp's system.

5. **PacifiCorp's recent presentations provide a misleading indication of the impact of removing carbon dioxide (CO_2) prices from its coal retirement analyses.** PacifiCorp's presentation ignores how resource selection and dispatch would change in the absence of a CO_2 price. It also misleadingly puts the focus on a single downside risk to coal unit retirements rather than a more balanced array of risks and uncertainties.

2. PACIFICORP'S STACKED RETIREMENT ANALYSES DO NOT EVALUATE A REASONABLE COMBINATION OF UNIT RETIREMENTS

At the April stakeholder meeting PacifiCorp presented updated results of its stacked coal unit retirement analyses. One of the main differences between PacifiCorp's latest analyses and the ones that PacifiCorp had previously presented is that PacifiCorp's latest analyses compare coal retirement portfolios to an updated Benchmark Case. As discussed in prior Sierra Club comments, the April Analysis Benchmark Case is substantially different from the previous Benchmark relied upon in the analyses presented in the December 3-4th Public Input Meeting ("December Analysis").[2] In our prior comments, we noted that PacifiCorp could not reasonably assume that the relative unit rankings of early coal plant retirements identified in the December Analyses still hold. As such, Sierra Club recommended that PacifiCorp re-run all or most of its

[2] Sierra Club Comments on PacifiCorp Coal Analysis Next Steps. Docket LC 70. January 8, 2019.

unit-specific retirement analyses to ensure that its updated stacked unit retirement portfolios include a reasonable range of combinations of PacifiCorp's least economic coal units.

Despite these concerns, PacifiCorp elected not to re-run **any** of its unit-specific retirement analyses using the updated Benchmark Case. Instead, the Company re-evaluated the exact same set of stacked retirement cases that it had assessed in the December Analysis, plus two additional stacked cases that it had not yet evaluated.[3]

PacifiCorp's adherence to the rankings derived from the December Analysis is inconsistent with PacifiCorp's own "corrections" released between January and March, showing that the Company's December Analysis had used incorrect modeling assumptions. In January, PacifiCorp noted that it had erred in omitting decommissioning costs from some cases, [4] used the wrong fixed costs in other cases,[5] and allowing retired units to dispatch in other cases.[6] In March, the Company added a completely new set of costs to the System Optimizer model to account for shortcomings in that capacity expansion model.[7] As a consequence, the March Presentation showed that the rankings of PacifiCorp's units had actually changed substantially,[8] and would have warranted a complete revisit of the stacked unit assessment.

So why did PacifiCorp maintain a stacked unit retirement series based on outdated information and known errors? PacifiCorp explained that its decision was justified by a "heuristic" levelized cost rank analysis presented at the March IRP stakeholder meeting. The Company claimed that this levelized cost ranking, which was based on new Benchmark Case assumptions, indicated that the combinations of unit retirements evaluated in December continued to represent a reasonable set of the least economic coal units.

Sierra Club disagrees. First, the stacked retirement assessments presented at the April stakeholder meeting does not represent a reasonable set of retirement combinations under the new Benchmark Case and in light of the errors found and disclosed by PacifiCorp and stakeholders. Second, the "heuristic" levelized cost analysis presented in March does not support PacifiCorp's choice of stacked retirement combinations.

---

[3] These new stacked retirement cases included Case C-42, in which Naughton Units 1 and 2 and Jim Bridger Units 1 and 2 retire in 2022, and Case C-43, in which Naughton Units 1 and 2, Bridger Unit 1, and Dave Johnston Unit 3 retire early

[4] PacifiCorp. 2019 Integrated Resource Plan (IRP) Public Input Meeting January 24, 2019. Hereinafter "January Presentation"]. P. 12.

[5] January Presentation. P. 12.

[6] January Presentation. P. 13.

[7] PacifiCorp. 2019 Integrated Resource Plan (IRP) Public Input Meeting March 21,2019. [Hereinafter "March Presentation"]. P. 10-13

[8] March Presentation. P. 18.

Sierra Club is particularly concerned that PacifiCorp's stacked retirement assessments fail to appropriately evaluate the early retirement of units at the Jim Bridger, Hayden, and Craig plants. Given that PacifiCorp did not perform unit-specific assessments of any of its units relative to the updated Benchmark Case, there may be additional uneconomic units that PacifiCorp has not yet identified that should have been evaluated in stacked retirement assessments but were not.

Table 1 presents each PacifiCorp coal unit's levelized cost rank under the March heuristic analysis alongside its economic rank under the unit-specific December Analysis and the number of stacked cases (out of 10) in which it was assumed to retire early. For both the levelized cost rank and PVRR(d) rank, a lower number means the unit is less economic (*i.e.,* a rank of 1 indicates the greatest value from earlier retirement). We draw particular attention to several key units.

Table 1. March Levelized Cost Ranking, December Analysis Ranking, and Stacked Analysis Treatment of PacifiCorp Coal Units

Unit	March Presentation Levelized Cost Rank	December Analysis PVRR(d) Rank	Number of stacked cases in which unit is evaluated
Hayden 1	1	4	5
Hayden 2	2	9	1
Naughton 2	3	3	8
Naughton 1	4	1	10
Craig 2	5	7	3
Craig 1	6	11	1
Jim Bridger 1	7	2	9
Jim Bridger 4	8	20	0
Jim Bridger 2	9	5	3
Jim Bridger 3	10	8	0
Hunter 1	11	19	0
Colstrip 4	12	10	0
Hunter 3	13	22	0
Colstrip 3	14	15	0
Hunter 2	15	18	0
Huntington 2	16	14	0
Wyodak	17	16	0
Huntington 1	18	17	0
Dave Johnston 1	19	13	0
Dave Johnston 2	20	21	0
Dave Johnston 3	21	6	2
Dave Johnston 4	22	11	0

Sources: March Presentation, pp. 18-19; April Presentation, p. 8

Table 1 leads us to two important conclusions:

1. **The economic ranking of several units changed substantially between the December unit-specific analyses and the March levelized cost analysis**. For example, Jim Bridger Unit 4 moved 12 places in the uneconomic rankings, from 20th least economic in December to 8th least economic in March. Conversely, Dave Johnston Unit 3 fell 15 places, from 6th least economic in December to 21st least economic in March.

2. **The degree to which each unit is evaluated in the stacked retirement assessments does not map to the latest levelized cost rankings**. For example, Hayden Unit 2, the second *least* economic unit under the levelized cost analysis, was evaluated in only one stacked case, a case in which eight other units were also assumed to retire. Meanwhile, Dave Johnston Unit 3, the second *most* economic unit, was included in two stacked retirement cases.

On October 2, 2018, PacifiCorp submitted a compliance filing under LC 70 outlining the scope and major assumptions of its proposed coal analysis, as required by the Commission. In that filing, PacifiCorp stated that "stacked analysis will be performed on the least economic units"[9] and that "results from [unit-by-unit] studies will be used to identify specific units and specific retirement years in a stacked retirement analysis."[10] While PacifiCorp's December Analysis purported to follow this analysis arrangement, the modified results of the April Analysis clearly do not follow its proposed methodology.

To remedy its analysis and provide the complete information required of a least-cost assessment, the Company must perform stacked retirement analysis as proposed by Staff, as affirmed by this Commission, and as acknowledged by the Company in the October compliance filing. Changing the underlying conditions of the analysis, acknowledging that the outcomes are substantially different, and yet failing to assess accordingly is inconsistent with reasonable and prudent utility planning.

Specifically, PacifiCorp should further evaluate the earlier retirement of the following units in the stacked retirement cases:

1. **Jim Bridger Units 3 and 4**. These units both rank among the ten least economic PacifiCorp coal units under the Company's latest levelized cost comparison. They present with similar economics as Bridger Units 1 and 2, which were evaluated in 9 and 3 stacked retirement cases, respectively. Indeed, Sierra Club has presented evidence in prior IRPs that Bridger 3 and 4 are not economic on a

[9] Oregon LC 70. PacifiCorp. Compliance Filing. October 2, 2019. Enclosure, p. 2.
[10] *Id.* P. 6.

going-forward basis, regardless of their recently installed emissions controls.[11] But Bridger Units 3 and 4 were not included in any of PacifiCorp's stacked retirement cases. At the April stakeholder meeting, PacifiCorp irrationally justified this decision by pointing out that Bridger Units 3 and 4 already have installed pollution-reducing selective catalytic reduction (SCR) technology. The Company stated that it does not want to retire the better-controlled Units 3 and 4 prior to the more polluting Bridger Units 1 and 2. PacifiCorp's logic is absurd and a red herring. The fact that these units have recent emissions controls, which notably have not been approved or assessed by this Commission, is irrelevant to the question of if their retirement serves the benefit of PacifiCorp ratepayers. First, PacifiCorp has never before sought (and does not now seek) to optimize either retirements or new builds to minimize emissions. At best, leaning on the fact that these units are recently retrofit succumbs to the sunk cost fallacy. At worst, PacifiCorp's intention not to assess Bridger 3 & 4 could be construed as an effort to shield this Commission from the poor economics of units with substantial unrecovered capital obligations.

We note that PacifiCorp's proposed least cost stacked case includes the retirements of both Bridger Units 1 and 2 (Case C-42),[12] units which are remarkably close in economic performance to Bridger 3 & 4. PacifiCorp must seek to assess if retiring Bridger 3 and 4 in addition to Bridger 1 and 2 is a least cost option.

Finally, Bridger 1 & 2 are subject to regional haze obligations. If PacifiCorp re-negotiates its obligations under the current EPA, it may decide to re-assess the economics of Bridger 1 & 2 without substantial capital additions. In such a case, the evaluation of Bridger 3 & 4, which have poor economics regardless of the lack of new capital obligations, is especially critical.

2. **Hayden Unit 2.** PacifiCorp's recent levelized cost analyses indicate that Hayden Unit 2 is the Company's second least economic unit. Yet that unit was evaluated in only a single stacked retirement case in which eight additional units were assumed to retire, including the relatively economic Dave Johnston Unit 3. Clearly, further assessment of Hayden 2 is justified. In particular, PacifiCorp should evaluate at least one case in which both Hayden Unit 1 and Unit 2 retire in the near term (and relatively economic units such as Dave Johnston Unit 3 are not also retired). Such a case could reveal potential synergies from retiring multiple units at the Hayden plant and thereby avoiding common plant costs.

[11] Oregon LC 67. Sierra Club Comments. June 23, 2017. P. 10. "Sierra Club determined that nine units, representing nearly one-third of PacifiCorp's coal boilers, are non-economic relative to market-based energy and capacity if replaced in 2018 – even without factoring in required regional haze retrofits. These non-economic units include Cholla 4, Craig 1, Craig 2, Hayden 1, Hayden 2, Jim Bridger 3, Jim Bridger 4, Naughton 1, and Naughton 2."
[12] April Presentation. P. 8.

3. **Craig Unit 1.** PacifiCorp's latest levelized cost comparisons indicated that Craig Unit 1 is the Company's sixth least economic unit. Yet, like Hayden Unit 2, Craig Unit 1 was evaluated in only a single stacked retirement case in which eight additional units were assumed to retire, including the relatively economic Dave Johnston Unit 3. The retirement of Craig Unit 1 should be evaluated in combination with the retirement of Craig Unit 2 (and without the retirement of Dave Johnston units) to determine whether there may be additional benefits to retiring multiple units at the Craig plant.

3. PACIFICORP'S STACKED RETIREMENT ANALYSES MUST ASSESS A DEEPER SELECTION OF NON-ECONOMIC UNITS.

The April Analysis showed that each and every one of the stacked scenarios assessed by PacifiCorp was economic – i.e. ratepayers saved money through the retirement of every and all units assessed by PacifiCorp. It is not clear, however, that additional retirements would not also yield ratepayer benefits. According to PacifiCorp's October compliance filing, the Company was to look at stacked retirement cases until there was a net cost instead of a benefit. Specifically, PacifiCorp stated that:

> The number of units assumed to retire early will continue (from two units to three units, etc.) until the economics from the stacked analysis reverse sign and show a net cost instead of a net benefit.[13]

As we discussed above, the inclusion of Dave Johnston 3 in the stacked analyses was clearly erroneous, and only served to make cases look more economic than warranted. It is critical that PacifiCorp assess its least economic units, and do so in an ordered fashion until it has arrived at a case in which the economics of a stacked retirement show a net cost instead of a net benefit.

4. PACIFICORP HAS NOT SUFFICIENTLY JUSTIFIED ITS APPROACH FOR IDENTIFYING A NEED FOR "RELIABILITY RESOURCES"

Another major difference between the April and December Analysis are that the latest analyses added "reliability resources" through a secondary SO run. Under PacifiCorp's updated modeling process, the Company uses its Planning and Risk (PaR) model to perform a deterministic

[13] Oregon LC 70. PacifiCorp. Compliance Filing. October 2, 2019. Enclosure, p. 15.

reliability assessment of an initial optimized portfolio developed using SO.[14] PacifiCorp then re-runs SO with most resources fixed at the levels identified in the initial SO run but other resource types allowed to increase to meet the identified incremental reliability need. At the April stakeholder meeting, PacifiCorp clarified that these "reliability resources" that are allowed to increase in the secondary SO run are limited to batteries, energy efficiency, gas peakers, and pumped storage.[15] The Company further clarified that its modeling builds 500 megawatts (MW) of additional capacity above and beyond any capacity shortfall identified in its deterministic reliability studies.[16]

PacifiCorp's new methodology for including additional "reliability resources" has significant implications for PacifiCorp's identified near-term resource needs. This is true even under the Benchmark Case. The preliminary Benchmark Case presented in December included negligible amounts of new capacity in the near term, and no new gas resources at any point in the 2020s.[17] The updated Benchmark Case presented in April includes new gas capacity starting in 2023 and reaching 500 MW by 2028.[18] It appears that all of this near-term gas capacity consists of "reliability resources" added in the new, secondary SO run.[19] This additional capacity arises soon enough that, if included in PacifiCorp's preferred portfolio, it would presumably need to be incorporated within the Company's short-term Action Plan.

The implications of PacifiCorp's new, unprecedented "reliability resource" methodology for its near-term Action Plan warrant careful scrutiny of the logic behind the new methodology. Sierra Club is particularly concerned with the following aspects of PacifiCorp's new reliability resource approach:

1. **Inclusion of 500 MW incremental resources beyond identified need**. To Sierra Club's knowledge, PacifiCorp has not provided any justification for its decision to include 500 MW of additional reliability resources in excess of any reliability need identified in its deterministic analyses. We understand the Company's general argument that a deterministic analysis may understate the need for ancillary services in the future. But the choice of 500 MW of excess capacity appears both arbitrary and large.

2. **Selection and representation of reliability resources**. PacifiCorp's methodology appears to assume that batteries, gas peakers, energy efficiency, and pumped storage are equally effective at providing ancillary services, and that

[14] March Presentation, p. 14.
[15] April Presentation, p. 40.
[16] *Id.*
[17] PacifiCorp. 2019 Integrated Resource Plan (IRP) Public Input Meeting December 3-4,2018. [Hereinafter "December Presentation"]. P. 15.
[18] April Presentation, p. 5.
[19] Compare April Presentation, p. 40 with April Presentation, p. 5.

other resources provide no reliability services whatsoever. Neither of these is true. Batteries generally provide reliability services such as frequency support and voltage support faster and more efficiently than other resources, including gas units.[20] In addition, wind and solar resources are capable of providing most critical reliability services, and enabling technology may increase their capabilities in the future.[21]

3. **Calibration with current grid operations**. Sierra Club is concerned that the reliability resource requirements included in PacifiCorp's latest modeling are unnecessarily conservative and do not reflect the actual needs faced by PacifiCorp in the course of operating its system.

Sierra Club recommends that PacifiCorp re-assess the reliability component of its modeling approach and refrain from proposing to build near-term resources that are based solely on an arbitrary and imbalanced determination of reliability needs and resources that might meet those needs.

5. PACIFICORP ASSUMPTIONS FOR JIM BRIDGER COAL UNITS

Besides the lack of assessment of Bridger Units 3 and 4, the April stakeholder meeting raised additional concerns regarding PacifiCorp's current and future assumptions relating to the Bridger units. These include coal price assumptions and assumptions regarding SCR installation requirements at Units 1 and 2.

5.1. Bridger coal price assumptions

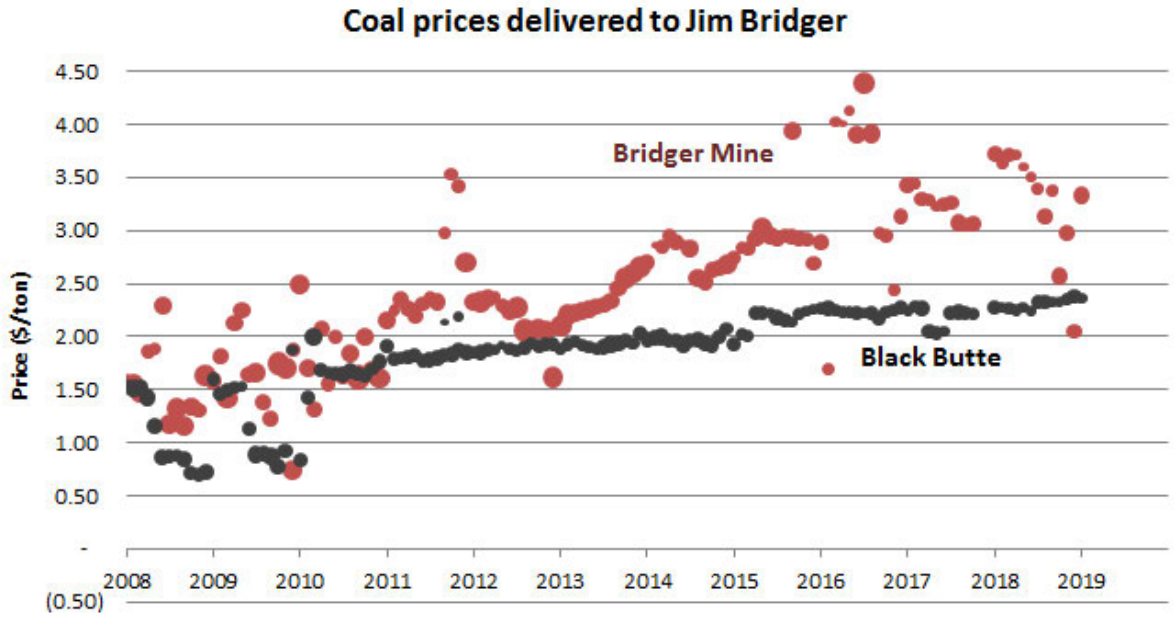
The Bridger plant coal price assumptions used in PacifiCorp's latest modeling appear to be understated. While the Company did not evaluate any portfolios in which only Bridger units were retired early, comparing across portfolio results presented at the April meeting provides a general sense of PacifiCorp's underlying Bridger coal price assumptions. Under Case C-34, in which only Naughton Units 1 and 2 retire early, levelized avoided fuel costs amount to $32.87 per megawatt-hour (MWh).[22] Under Case C-42, in which Bridger Units 1 and 2 and Naughton Units 1 and 2 all retire early, the levelized avoided fuel cost drops to $30.65 per MWh. This suggests that the assumed Bridger coal price is less than $30 per MWh.

[20] Silverstein, Alison, Rob Gramlich and Michael Goggin. *A Customer-focused Framework for Electric System Resilience*. Appendix B – Reliability Services Capabilities for Major Energy Sources. May 2018. .*Available at* https://gridprogress files.wordpress.com/2018/05/customer-focused-resilience-final-050118.pdf.
[21] *Id.*
[22] April Presentation. P. 16.

A forecasted levelized Bridger fuel price of less than $30 per MWh appears to be quite optimistic. Since all the Bridger units have historically averaged heat rates of greater than 10 million British thermal units (MMBtu) per MWh[23], a fuel price of less than $30 per MWh implies an average delivered coal price of less than $3 per MMBtu.

Jim Bridger receives coal from the nearby third-party owned Black Butte mine, but the majority of its coal is still supplied by the PacifiCorp majority-owned Bridger Mine. As shown in Figure 1, below, the delivered cost of coal from Bridger Mine has risen rapidly in recent years and generally maintained well above $3/MMBtu,[24] making it the most expensive coal burned in the west. Even the coal from Black Butte has been rising at nearly 4% per year – a rate at which it would be expected to exceed $3/MMbtu by 2024.

Figure 1. Historical Bridger Plant Delivered Coal Price from Bridger Mine



Source: Form EIA-923

Thus, PacifiCorp's Bridger coal price assumptions appear to depend on either the price of coal from the Bridger Mine and Black Butte decreasing substantially in the future or Bridger transitioning to receiving a greater percentage of its coal from alternative, lower-cost mines. PacifiCorp should provide greater clarity regarding the basis for its Bridger coal price assumptions.

[23] Based on data collected through U.S. Energy Information Administration Form EIA-923.
[24] U.S. Energy Information Administration Form EIA-923.

5.2. Bridger Unit 1 and 2 SCR Assumptions

During the April stakeholder meeting, PacifiCorp indicated that its next steps will include an evaluation of alternative regional haze regulation compliance options at Bridger Units 1 and 2. Under these alternatives, Bridger Units 1 and 2 would be able to continue operating beyond 2022 without installing SCR, a departure from the assumptions contained in PacifiCorp's recent coal unit retirement analyses. The potential evaluation and incorporation of these alternative regional haze compliance approaches raises two related concerns:

1. **Legality**. Current laws and regulations require the installation of SCR technology at Bridger Units 1 and 2 by 2022. If PacifiCorp is to plan on continuing to operate either or both of those units without SCR beyond 2022, it must present a clear legal and/or technical analysis justifying the feasibility of such a plan, and do so within the construct of the IRP.

2. **Impact on economic retirement determinations**. If PacifiCorp determines that it need not install SCR at Bridger Units 1 and 2 in order to continue to operate those units, then the economic case for continuing to operate those units will be stronger. This is important because at least one of these units is retired in 9 out of the 10 stacked retirement cases evaluated by PacifiCorp to date. The exclusion of SCR costs at the Bridger units would therefore make all of those retirement combinations less economic. If PacifiCorp were to proceed with such a substantial change to its cost assumptions, then it must evaluate a new set of stacked retirement cases that do not include retirements of Bridger Units 1 or 2. In that case, at least some of these stacked cases should include the retirement of Bridger Units 3 and/or 4 instead of Units 1 and 2.

6. ADDRESSING THE IMPACT OF NEW WYOMING LEGISLATION ON COAL PLANT RETIREMENT DECISIONS

At the April stakeholder meeting, PacifiCorp identified one its IRP next steps as assessing likely schedules for implementing a request-for-proposals process consistent with new legislation in Wyoming.[25] This next step is evidently driven by Wyoming's recently passed Senate File (SF) 159 bill.[26] SF 159 would essentially require that PacifiCorp (1) seek to sell its coal units to a third party prior to retiring them and (2) purchase electricity from any sold coal units so long as the cost of that electricity is less than or equal to some avoided cost rate determined by the Wyoming Commission.

[25] April Presentation. P. 3.

[26] SF0159. *New opportunities for Wyoming coal fired generation.* Wyo. *Available at* https://www.wyoleg.gov/Legislation/2019/SF0159.

Sierra Club is concerned that the implementation of SF 159 could harm non-Wyoming ratepayers by delaying the retirement of uneconomic coal units and/or requiring PacifiCorp to continue to purchase energy from uneconomic coal units on behalf of its Wyoming customers. Sierra Club recommends that, to the extent that PacifiCorp's future operational and IRP analyses account for the impact of SF 159, the Company also take steps – both within its analyses and in its actions - to isolate non-Wyoming customers from those impacts. For example, if PacifiCorp were to evaluate a sensitivity in which instead of retiring a coal unit it sells that unit and purchases some of its electricity through a power purchase agreement (PPA), it could separately model the Wyoming portion of its system to ensure that the Company would only be purchasing such coal-fired generation to serve its Wyoming customers. Whatever the exact technical solution implemented to address SF 159 in PacifiCorp's resource planning, the Company should uphold the guiding principle that **non-Wyoming ratepayers must be held harmless from the impacts of SF 159**.

In addition to its impacts on the IRP, PacifiCorp indicated during the April meeting that it might need to delay any cost-effective retirements to allow the Wyoming commission the time to assess a potential purchase under SF 159. It is imperative that Wyoming's laws seeking to encumber Wyoming ratepayers with otherwise non-economic coal do not impact non-Wyoming parties. The Commission should critically review any claims made by PacifiCorp that a retirement must be delayed on behalf of SF 159; similarly, PacifiCorp must present a pathway that provides non-Wyoming ratepayers the opportunity to expediently exit uneconomic coal-burning power plants.

7. IMPACT OF CO_2 EMISSION COSTS ON PORTFOLIO RESULTS

At the April stakeholder meeting, PacifiCorp repeatedly presented the CO_2 emission cost savings for each stacked retirement case as a percentage of that case's total savings relative to the Benchmark Case.[27] The clear implication was that each set of retirements would appear less beneficial in the absence of a CO_2 emissions price, and that some stacked cases would provide negative value in the absence of emission prices. While it is true that the absence of any future CO_2 emissions price would make PacifiCorp's coal units appear more economic, Sierra Club objects to the Company's focus on and presentation of the portion of portfolio benefits accounted for by emission cost savings.

Though future CO_2 emissions prices are uncertain, so are a wide array of other assumptions baked into PacifiCorp's coal retirement analyses, the impact of which PacifiCorp did not address in its presentation. In addition, multiple states in which PacifiCorp operates already have enacted

[27] April Presentation. P. 9-13.

laws that require the use of positive CO_2 emissions prices in IRP modeling. There is also a distinct possibility that additional legislation and regulation at the state and federal levels will result in future CO_2 emissions prices higher than those included in the Company's base forecast. It is therefore unreasonable and one-sided to focus on the impact of assuming zero CO_2 emissions prices at any point in the future.

Furthermore, PacifiCorp's estimates of the percentage of cost savings represented by emission cost reductions do not reasonably account for the impact of assuming zero future CO_2 prices. Assuming no CO_2 prices would change replacement resource selection and resource dispatch in ways that are not accounted for by PacifiCorp's simplistic metric. Thus, removing CO_2 prices would likely not have as great an impact on relative portfolio costs as PacifiCorp's presentation indicates.

For these reasons, we recommend that PacifiCorp no longer make use of the CO_2 cost savings metric presented repeatedly during the April stakeholder meeting. At a minimum, this misleading metric should not be used to drive resource planning decisions.

Dated: May 17, 2019

Respectfully submitted,

/s/ Gloria D. Smith

Gloria D. Smith
Managing Attorney
Sierra Club Environmental Law Program
2101 Webster Street, Suite 1300
Oakland, CA 94612
(415) 977-5532,
gloria.smith@sierraclub.org

Attorney for Sierra Club