PacifiCorp - Stakeholder Feedback Form

2025 Integrated Resource Plan

PacifiCorp (the Company) requests that stakeholders provide feedback to the Company upon the conclusion of each public input meeting and/or stakeholder conference calls, as scheduled. PacifiCorp values the input of its active and engaged stakeholder group, and stakeholder feedback is critical to the IRP public input process. PacifiCorp requests that stakeholders provide comments using this form, which will allow the Company to more easily review and summarize comments by topic and to readily identify specific recommendations, if any, being provided. Information collected will be used to better inform issues included in the 2025 IRP, including, but not limited to the process, assumptions, and analysis. In order to maintain open communication and provide the broader Stakeholder community with useful information, the Company will generally post all appropriate feedback on the IRP website unless you request otherwise, below.

Date of Submittal: 8/9/2024

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City: State: Zip:

Public Meeting Date comments address: ☐ Check here if not related to specific meeting

List additional organization attendees at cited meeting:

***IRP Topic(s) and/or Agenda Items:** List the specific topics that are being addressed in your comments.

- Modeling coal costs and risks in the 2025 IRP planning process

☒ Check here if you want your Stakeholder feedback and accompanying materials posted to the IRP website.

***Respondent Comment:** Please provide your feedback for each IRP topic listed above.

In November 2022, we submitted a stakeholder feedback form requesting information about coal supply chain issues resulting from the Lila Canyon Coal Mine fire and for ongoing updates as the situation evolved.[1] At the time, the Lila Canyon coal mine fire was an emerging situation, and PacifiCorp would not speculate about potential impacts. Since then however, the Company has not provided any updates to stakeholders in the 2025 IRP public input meetings. Yet in recent months coal supply issues have been addressed at length in other forums:

- Docket No. 24-035-13: In their audit of PacifiCorp's fuel inventory prices, the Division wrote about PacifiCorp's fuel inventory report and described coal fuel supply disruptions and other force majeure events at coal mines that affected coal supplies in Utah. Many of the details of the report are redacted, however.[2]
- Docket No. 24-035-04: In his Direct Testimony, Ramon Mitchell provides another, more comprehensive description of the situation and its impact on the Company's application for a rate increase.[3] Mitchell's testimony reveals an extensive list of issues affecting coal supplies and costs in Utah:
    - "In 2022 through 2024, the coal market experienced strained conditions. The unprecedented increase in coal prices, instability in coal supply and overall market fluctuations have caused adverse impacts to the Company and other large consumers. This negative impact is due to multiple factors, including but not limited to: (1) increased coal demand due to high domestic natural gas prices; (2) low inventories at coal-fired power plants; (3) increased demand abroad for coal exports; (4) international and domestic supply chain constraints; (5) labor and material shortages; and (6) weather events and general market inflation.

      Moreover, the Lila Canyon mine fire removed approximately 25 percent of Utah coal production and disrupted the same portion of the Company's coal supply needs in Utah. On November 18, 2023, the Company was informed that the Lila Canyon mine will not reopen and will be permanently closed. The

[1] See https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/integrated-resource-plan/2023-irp/2023-irp-comments/2023.031.%20Utah%20Clean%20Energy%2011-23-22%20(with%20response).pdf.

[2] See https://pscdocs.utah.gov/electric/24docs/2403513/333586RdctdDPUCmnts4-30-2024.pdf.

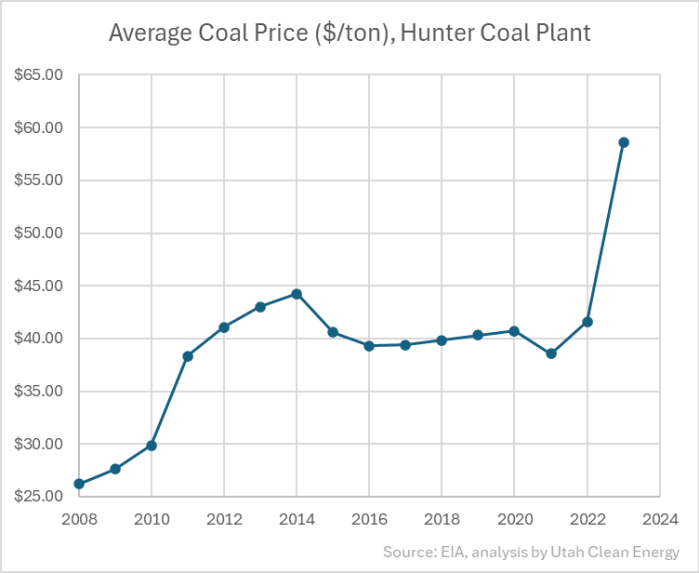
[3] See https://pscdocs.utah.gov/electric/24docs/2403504/334494RdctdDirTstmnyRamonJMitchellRMP6-28-2024.pdf.

* Required fields

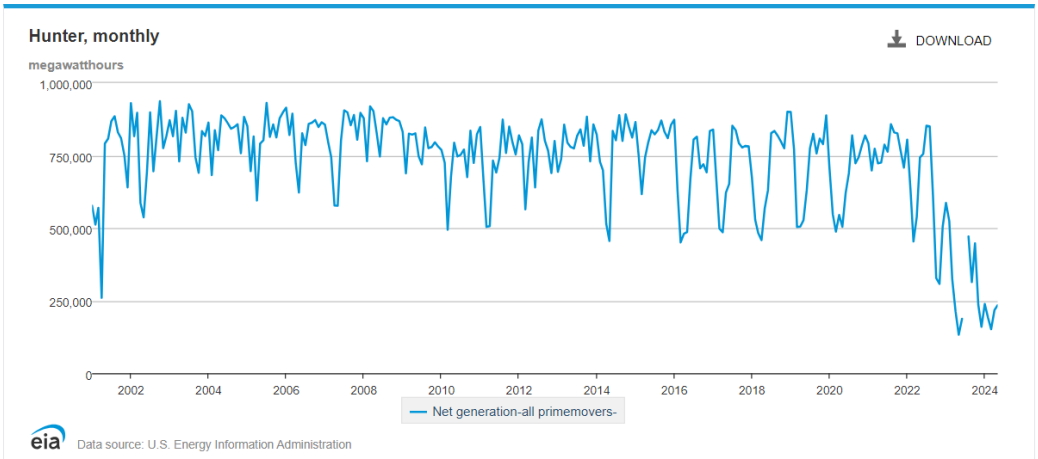
closure of Lila Canyon created a significant coal production shortfall in Utah in 2023 and will continue to have negative impacts to all large consumers, including the Company, in 2024 and potentially 2025.

In addition to the Lila Canyon mine issues in Utah, coal suppliers continue to experience issues relating to unfavorable geologic and mining conditions, delays and pressure relating to securing federal mining leases, limited availability of trucking and railway transportation for coal, long lead-times for procurement of necessary mining equipment, and limitations in availability of financing, which has put them at an increased risk of becoming insolvent. . . . The impact of these coal supply challenges is an increase of $264 million on a total-company basis. This increase is driven by increased market purchases to cover the generation reduction."[4]

Examining EIA data on coal costs provided to the Hunter coal plant, the weighted average coal prices dramatically increased by 41% in 2023 compared to prior years:[5]



In addition, DPU's audit mentioned above noted that, due to the coal supply chain issues in Utah, S&P Capital IQ reported that the capacity factor at Hunter decreased from 61.8% in 2022 to only 32.9% in 2023. This decreasing capacity factor is confirmed in EIA's electricity data browser:[6]



[4] See *id.* at 20-22.
[5] See https://www.eia.gov/coal/data/browser/#/shipments/plant/6165/?freq=A&pin=.
[6] See https://www.eia.gov/electricity/data/browser/#/plant/6165.
* Required fields

This decreasing capacity factor raises reliability concerns as explained by NERC's 2024 State of Reliability Report identifies. NERC has observed an increasing trend of weighted equivalent forced-outage rates (WEFOR) for coal resources:[7]

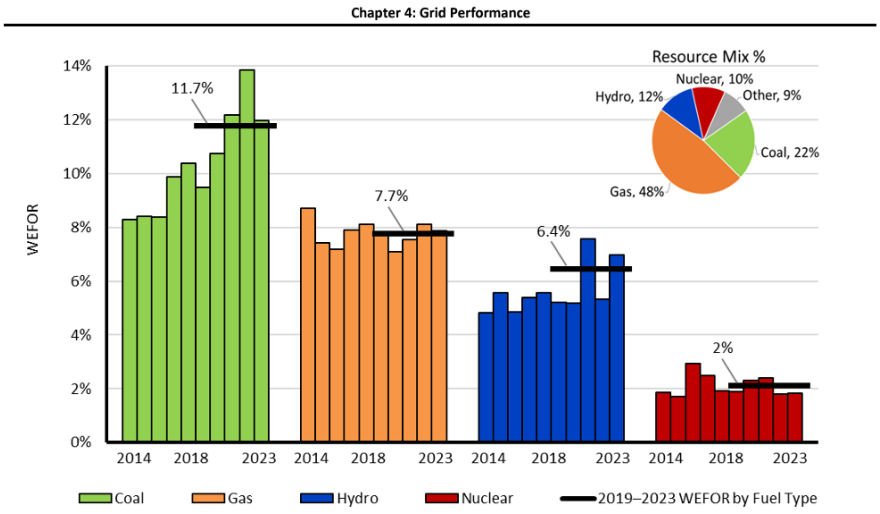


Figure 4.5: 10-Year Annual WEFOR by Fuel Type and 2023 Resource Mix by Net Maximum Capacity

NERC's report examined the rising trend of forced outage rates of coal and found that it correlates mostly closely with capacity factors falling below 60%. The report states:

> "Although coal-fired generation experienced a large decrease in WEFOR in 2023 (12.0% in 2023 versus 13.9% in 2022), it remains above pre-2021 rates. Due to year-over-year variability, coal generation is the primary driver of change in the overall WEFOR despite more energy being produced by both natural gas and nuclear power in 2023. ***Further investigation into baseload coal generation indicates that a unit's WEFOR negatively correlates most strongly to capacity factor. Notably, once capacity factor falls below approximately 60%, unweighted average EFORs of units begin increasing more rapidly than those between 60% and 100%.*** Although forced-outage hours are a definite contributor to lower capacity factor units' increased WEFOR, the disproportionate change appears to be driven more by maintenance/planned outage hours and decreased service hours. This aligns with industry statements indicating that reduced investment in maintenance and abnormal cycling that are being adopted primarily in response to rapid changes in the resource mix are negatively impacting baseload coal unit performance."[8]

The recent real-world experience of an exceptionally fragile coal supply chain and volatile global market prices that will cost ratepayers hundreds of millions of dollars of additional costs has exposed the true costs and risks of PacifiCorp's overreliance on coal. These risks and costs are in addition to the carbon pollution driving the changing climate and causing societal impacts like increasing wildfire risks, which are also impacting ratepayers. Therefore, it is imperative to understand how these costs and risks are incorporated in PacifiCorp's 2025 IRP, which includes the quantitative modeling aspects and the qualitative assessments.

To better understand how spiking coal costs and risks affect the 2025 IRP modeling, we request the following information:

1. How are coal costs represented in PLEXOS? Is there an average price used for all coal plants, or are coal prices specific to each coal plant? If an average price for all coal plants is used, how are price spikes such as those in Utah reflected in PLEXOS? Similarly, how are operations and maintenance costs reflected? What costs are excluded from the PLEXOS model because they're considered "sunk" or "fixed" costs? How many coal plants have "minimum take" requirements?

[7] https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2024_Technical_Assessment.pdf, at 59.
[8] *Id.*
* Required fields

Reply:

- Coal costs in PLEXOS are specific to the plant. Costs at Bridger differ from costs at Hunter (as an example). Coal prices are based on anticipated levels of supply at a specific price point. Data is put into the model as $/MMBTU for the cost, and as a quantity of MMBTU that are available. Many coal plants (but not all) have multiple coal fuels available (an initial amount at a certain price, then a "tier 2" fuel with some other amount available at a higher price etc.).
- Fixed Operations and Maintenance (O&M) costs, and ongoing capital costs are modeled as a single levelized fixed Operations cost. Any ongoing capital that is not recovered is added to the retirement cost on a declining balance basis so the model does see an ability to "get out" of the balance of the cost by retiring the unit.
- No coal plants were modeled with minimum take requirements in the 2023 IRP. For the 2025 IRP, there is a contract in place for Hunter/Huntington that may require representation in PLEXOS modeling through 2030, after which time the requirement would be released.

2. Coal fuel costs are a critical factor to consider in terms of understanding how different resources compare to each other and contribute to overall portfolio costs. In past IRPs, Chapter 3 has had a section on Natural Gas Prices that includes Henry Hub Price Forecasts. Coal prices should also have a forecast in the 2025 IRP. A coal price forecast should start at prices consistent with current market conditions and should assume escalating prices into the future given the state of the market. Please provide the coal price forecast that is used to inform the PLEXOS model. We understand that specific coal contract terms cannot be revealed publicly, but there must be a way to aggregate the data in a meaningful way for public disclosure, for example by overall price at the plant level like the EIA data shown above.

   Reply:

   - The coal costs used for PLEXOS modeling is available in the Master Assumptions folders on the confidential data disc.

3. Additionally, please report the cost of coal in terms of $/MWh for the 20-year planning horizon, including fuel, fuel transportation, operations, maintenance, depreciation and any other relevant costs. Please describe which costs are included in the $/MWh and which costs are not included.

   Reply:

   - As discussed in the August 14-15, 2024 Public Input Meeting, coal use is heavily dependent upon the heat rate curve of the coal plants in question, and the number of MW produced by the plant varies based on the heat rate curve. O&M numbers are aggregated for each thermal unit, and are not broken out by type of O&M, so providing the specific coal related O&M Costs used by the model is not feasible. All costs associated with the delivery and combustion of coal are incorporated into the fuel price used.

4. Given recent changes in coal suppliers, please describe how variations in coal composition and quality, such as the content of sulfur, ash, and moisture, will affect coal plant heat rate and efficiency. How does coal quality affect the price of the electricity produced in $/MWh? Will changes in coal quality affect the maintenance or reliability of plants? Are coal composition factors modeled within PLEXOS for each coal plant?

   Reply

   - As discussed in the August 14-15, 2024 Public Input Meeting, coal fuel characteristics are all included in the fuel price and emissions rate per MMBTU of fuel consumed. These figures and characteristics are aggregated across the coal supply for each plant and are not broken out independently.

5. How will changes in coal suppliers and quality affect emissions from the plants in terms of NOx, SO2, and carbon?

   Reply

- As discussed in the August 14-15, 2024 Public Input Meeting, emissions rates per MMBTU of fuel consumed are determined in forecasts provided to the IRP team. Should changes in forecasted supply quality cause these rates to change, these rates would be aggregated and updated to reflect that change. All of PacifCorp's coal units are required to meet NO_X and SO_2 rates that are based on permitted limits. PacifiCorp will continue to meet these NO_X and SO_2 rates regardless of coal quality. CO_2 emissions could increase or decrease based on coal quality and gross calorific heat value but will generally increase with lower coal rank and quality.

6. Please describe how coal fuel supply risks will affect the planning reserve margin given recent experience that supply chain disruptions caused significantly reduced capacity factors for Utah coal plants.

   Reply

   - PacifiCorp's IRP plans to meet the hourly demand requirements of the system, including reserves requirements. To the extent outages are higher, or reserve holding capabilities of plants are diminished, and additional resources are selected in the IRP model to meet PacifiCorp's obligations.

7. Please describe how coal plant reliability metrics are being tracked as their capacity factor decreases. How are these reliability metrics being incorporated into the 2025 IRP modeling process?

   Reply

   - As discussed in the August 14-15, 2024 Public Input Meeting during the Daily Shapes portion of the presentation, historical actuals are being used in modeling.

8. How are disruptions like the recent Lila Canyon coal mine fire being incorporated into stochastic risk metrics throughout the planning horizon? For example, how would a coal supply disruption in a specific year affect a given portfolio (e.g. a force majeure event in 2030 removing >25% of coal supply)? Disruptions like this should be examined for cost and reliability metrics.

   Reply

   - Depending on incoming requests and requirements, PacifiCorp is willing to consider a sensitivity changing coal supply assumptions.

9. In DPU's review of PacifiCorp's coal fuel supply report linked above, they discussed six PLEXOS scenarios that were run to examine coal risks (pg 8), however the DPU's description of those scenarios was partially redacted. Please provide an un-redacted and detailed description of those scenarios and the conclusions from them.

   Reply

   - In February 2024, PacifiCorp evaluated six different scenarios for the Hunter and Huntington Plants using different assumptions and inputs to the PLEXOS model. The base scenario assumed the coal supply agreements (CSA) at the Hunter and Huntington plants with Wolverine Fuels, the principal coal supplier in Utah, were renegotiated and amended. The alternative scenarios assumed other coal supply options and/or market conditions. The evaluation assessed the total cost of each scenario on a present value revenue requirement (PVRR) basis. The cost of the base scenario was significantly lower than the other scenarios and led to PacifiCorp's decision to amend the Hunter/Wolverine CSA and Huntington/Wolverine CSA. The following is a brief description of the different scenarios:
   - Scenario 1 - The Hunter/Wolverine CSA is amended to include additional years to the term. The prospective Fossil Rock Mine will begin to provide volumes to Hunter in 2025. The Huntington/Wolverine CSA is amended with no extension of the current 2029 term. The Utah coal market becomes stable again and generation constraints recede.
   - Scenario 2 - PacifiCorp does not sign amendments with Wolverine. Pricing is assumed to be reset to current Utah market prices which is higher than the anticipated Hunter/Wolverine and

Huntington/Wolverine amendments. The Fossil Rock Mine does not reopen and coal supply in Utah remains constrained and unstable.

- Scenario 3 - PacifiCorp does not sign amendments with Wolverine. Pricing is assumed to be reset to current Utah market prices. Wolverine does eventually reopen the Fossil Rock Mine, and the Utah coal market becomes more stable.
- Scenario 4 - PacifiCorp does not sign amendments with Wolverine. PacifiCorp's existing contracts are terminated, and the pricing is assumed to be reset to current Utah market prices plus a premium price which assumes fewer coal suppliers in the region. The Fossil Rock Mine does not reopen and coal supply in Utah remains constrained and unstable.
- Scenario 5 - PacifiCorp does not sign amendments with Wolverine. PacifiCorp receives limited Utah market coal supply for a period. PacifiCorp spends capital to build a rail unloading facility in central Utah and modify the Utah Plants to consume Powder River Basin coal.
- Scenario 6 - PacifiCorp does not sign amendments with Wolverine. PacifiCorp receives limited Utah market coal supply for a period. PacifiCorp spends capital to build a rail unloading facility in central Utah and purchases additional coal from Colorado mines.

Data Support: If applicable, provide any documents, hyper-links, etc. in support of comments. (i.e. gas forecast is too high - this forecast from EIA is more appropriate). If electronic attachments are provided with your comments, please list those attachment names here.

- See footnotes.

Recommendations: Provide any additional recommendations if not included above - specificity is greatly appreciated.

- See above

Please submit your completed Stakeholder Feedback Form via email to IRP@Pacificorp.com
Thank you for participating.

* Required fields