

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 8/27/2024

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*Organization: Sierra Club

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City: Oakland

State: CA

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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.

- Demand side management
- Granularity Adjustments
- Reliability Adjustments
- EIR
- Federal Regulations
- Resource Availability



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.

Sierra Club provides the following recommendations for PacifiCorp's 2025 IRP. Additional information supporting these recommendations is attached to this Stakeholder Feedback Form

1. Demand Side Management

a. EE Supply Curves

- i. Provide sufficient time for review of the EE supply curves and the opportunity to suggest changes prior to modeling.
- ii. Remove any cost thresholds above which EE measures cannot be considered for IRP model selection, and instead include all possible EE measure bundles in the supply curve and allow the model to select the bundles that minimize cost across the entire resource portfolio
- iii. Ensure that administrative costs are aligned with real-world administrative costs for utility EE portfolios (i.e., less than 10%)
- iv. Assume at a minimum EE measure incentive levels at 75-100%, and consider incentive levels exceeding 100% (e.g., 125%, 150%)
- v. Additional flexible load options:

* Required fields

1. Include bidirectional charging as a resource option
 2. Consult with the Vehicle Grid Integration Council on best practices for developing new vehicle to grid program opportunities
 3. Consider new flexible load options for new large load customers, particularly data centers
- vi. Consider incremental heat pump costs relative to both a heating and cooling baseline technology, informed by recent research on heat pump costs and available federal incentives, including information already compiled by Calmus on behalf of PSE (and excerpted below).
- b. Include EE/DR bundles as potential reliability adjustment resources

Reply:

- a.
 - i. Thank you for your feedback. The energy efficiency options for use in the IRP modeling are developed by an outside consultant, Applied Energy Group (AEG). AEG has presented their findings and plan related to the Conservation Potential Assessment (CPA) in several IRP Public Input Meetings within the 2025 IRP Planning cycle. Planning and timelines for the CPA were presented in the January 25, 2024 Public Meeting with information starting on slide 19. Further conversation and opportunity for feedback related to the CPA took place in the May 2 and July 17/18 Public Input Meetings (starting on slide 5 and 75 respectively) and will be included in the upcoming September meeting. AEG provided forums and opportunities for engagement outside of these meetings. Due to the time required to develop CPA outcomes and also continuously review stages of work with feedback from stakeholders, this timeline would be challenging to accelerate beyond the acceleration that has already occurred.
 - ii. PacifiCorp does not, nor has it ever, applied any cost threshold above which DSM-EE measures cannot be considered for selection in the IRP.
 - iii. Thank you for the suggestion. PacifiCorp is currently working with AEG to examine the way it will be modeling these administrative costs across all states in the 2025 CPA, based on historical annual report trends.
 - iv. Thank you for the suggestion. PacifiCorp is currently working with AEG to examine modeled EE measure level incentives for the 2025 CPA.
 - v. AEG will be sharing details about demand response modeling methodology in the upcoming public input meeting September 25-26, 2024.
 - vi. Thank you for sharing the relevant Cadmus study. The CPA currently does include both baseline type costs for heat pumps in the characterization, in line with Rocky Mountain Power programs.
- b. All resources (including EE/DR bundles) are eligible to be selected to cover ST reported, shortfall-adjusted load in following iterations of the LT model.

2. Granularity Adjustments

- a. Reporting Recommendations
 - i. Report steps taken to reduce out-of-model granularity adjustments, including any differences between the 2025 and 2023 methodology, including whether decreasing fixed cost (slide 44, March meeting) was part of the process in 2023 and if not, how that addition is improving the granularity adjustment process.
 - ii. Clearly report methodology, values, and impacts of adjustments.
- b. Modeling Recommendations
 - i. Granularity adjustments should primarily be applied to flexible resources, i.e. resources the value of which is not fully captured in the LT model because of the lower temporal resolution: energy storage and peakers.

- ii. Ensure that the energy value of a resource's output in the LT Model and that in the ST model include the same cost components for a consistent comparison.

Reply:

- a. The Granularity Adjustment is inherently an "in-model" adjustment as it directly takes model outputs and feeds them back into PLEXOS. In order to review model results and verify reasonability of model outcomes, there is a reporting "pause" in this step, however there could be a direct loop setup in PLEXOS that would integrate the differences between LT and ST values directly in model runs.
 - i. The Granularity Adjustment has always either been a cost increase (for items the LT views as more valuable than the ST) or a cost decrease (for items the LT views as less valuable than the ST).
 - ii. In the 2023 IRP update, granularity adjustments were calculated automatically on each portfolio based on the difference between the LT and ST value of each resource. This value was fed back into the LT models for each following iteration (i.e. iteration 2 used values from iteration 1; iteration 3 used values from iteration 2 etc.). This methodology was discussed in the narrative of the 23 IRP Update, and the values of all granularity adjustments were included on the data disc.
- b. Granularity adjustments are applied to all resources, and applying a granularity adjustment to only a subset of resource types would skew the value of those resources relative to other options. The automatic calculation of the difference between values in the LT and ST is part of an iterative process, which has been reviewed by modeling consultants with Energy Exemplar. PacifiCorp's process of using a granularity adjustment has been described by Energy Exemplar as a "gold standard" of model use. Additionally, a member of the PacifiCorp IRP team has been asked to present on PacifiCorp's granularity adjustment and reliability load adder at an Energy Exemplar symposium in Seattle on October 15. The company expects this modeling approach will help other clients obtain better results.

The granularity adjustment is calculated automatically in the same way for each resource from the PLEXOS LT and ST output and can be viewed in reporting on the data disc.

3. Reliability Adjustments

- a. Reporting Recommendations
 - i. Provide PLEXOS output files for the initial and reliability-adjusted portfolios, as well as a spreadsheet mapping the initial and reliability-adjusted portfolios, together with a list of the resources that have been added, removed, delayed, or in any way adjusted by the Company, and a justification for this choice.
- b. Modeling Recommendations
 - i. Provide details on the rationale and methodology of reliability adjustments during the public input meetings prior to the filing of the draft IRP.
 - ii. Provide stakeholders with an opportunity to recommend alternative reliability adjustments.
 - iii. Resources options considered for addressing the identified reliability issues should include renewable energy sources, energy storage, and demand side resources.

Reply:

- a. In the 2023 IRP Update, PacifiCorp allowed the model to endogenously select all resources and made no resource additions outside the model for the purpose of achieving reliability. As such, there is no reporting of resources that have been manually adjusted by the company because the company did not manually adjust resource selections.

Reliability in the 2023 IRP update was achieved by adding hourly shortfalls identified by the ST model to the base LT load file and allowing the PLEXOS model to select a new suite of resources based on this additional load. All LT model reports were published on the Data Disc, and by comparing iteration 1 to iteration 2 it is possible to see the change in resources (due to both the granularity adjustment and also the additional load).

In light of stakeholder feedback, PacifiCorp has confirmed with Energy Exemplar consultants this is an appropriate use of model functionality and data. Energy Exemplar consultants have described PacifiCorp's iterative approach as the "gold standard".

- b. Given the above process, where the model endogenously selects resources for reliability, responses are as follows:
 - i. The model is endogenously selecting resources based on the methodology of adding shortages to the load file; there is no exogenous selection of resources thus no rationale/methodology to explicitly explain.
 - ii. Stakeholders are welcome to recommend alternatives to the endogenous selections at any point, but note there are no exogenous reliability adjustments, and given the updated process, no exogenous additions or adjustments to the portfolio are considered.
 - iii. The model considers ALL modeled resource options to cover the load; resources are selected using PLEXOS core functionality and data.

4. Energy Infrastructure Reinvestment Program

- a. Reporting Recommendation
 - i. Provide an update on PacifiCorp's efforts to secure EIR financing from the DOE Loan Program Office and any analysis that has been conducted to assess the associated benefits.
- b. Modeling Recommendation
 - i. Incorporate financing opportunities made available under the EIR program, which can enable the closure of coal plants, the replacement of fossil resources with cleaner alternatives, and the development of transmission infrastructure. Specifically, PacifiCorp should conduct:
 - 1. A scenario in which transmission network upgrade costs in Cluster Areas 1, 2, 4, 12, and 14 are reduced by 30 percent; and
 - 2. A scenario in which EIR financing is assumed for early retirement and replacement of Jim Bridger Units 3 and 4, Huntington, Hunter, and Wyodak. In this scenario the model should be allowed to select the economic retirement of those units assuming EIR financing.

Reply:

- a. Thank you for your feedback. Opportunities are being evaluated and pursued; PacifiCorp will provide a public update of these activities when available. Sensitivity studies are planned to assess high, medium and low levels of program adoption relevant to the IRA and IIJA.
- b. As discussed in the August Public Input Meeting, PacifiCorp is evaluating an extremely low cost renewables scenario which leverages the lowest required return on investment at the standard Investment Tax Credit rate for a resource (assuming federally subsidized financing), the most aggressive cost decline curves from NREL, and extending the construction timing eligibility for Production Tax Credits indefinitely. PacifiCorp believes modeling these parameters for future proxy resources is a reasonable representation of

being able to acquire resources while successfully leveraging every possible program.

5. Compliance with Federal Regulations

- a. Clean Air Act 111(d) Regulation & CO₂ Price Assumptions
 - i. Compliance with the EPA 111(d) rule should be modeled as part of the base model, not as a variant or price-policy scenario (MR). The five price-policy scenarios (including MM), as defined in the 2023 IRP analysis can be used, with all of them requiring Section 111(d) compliance of existing coal and new gas resources, while the N, M, H, and SC assumptions will define the CO₂ price in addition to the required EPA 111(d) compliance.
 - ii. CO₂ prices should be included in LT, but the Company should also conduct and report ST results without the carbon cost included in the dispatch decisions.
 - iii. Cumulative carbon costs associated with each portfolio, although not included in dispatch decisions, should be reported through a post-optimization calculation.
 - iv. Variants that perform well should have LT runs presented for all price-policy scenarios.
- b. Regional Haze Program
 - i. As part of the base model (i.e., included in all portfolio runs), include an SCR requirement at Hunter 2, Huntington 1 and Huntington 2. Additionally, require that the model select either SCR or SNCR at Naughton, Wyodak, and Dave Johnston 1, 2, and 4.
 - ii. As a variant case, include an SCR requirement at all five units at Hunter and Huntington, while keeping the same modeling assumptions at the Wyoming units.

Reply:

- a. A CO₂ Price has always been intended to be representative of future policy driving towards the reduction in CO₂ emissions (excepting where there is a legally binding price in existence such as the Social Cost for Washington, or the Carbon adder at Chehalis). Including EPA 111(d) compliance in the Low/No and Medium/No price-policy scenarios would be counter to evaluating portfolios developed in an environment where policy is ultimately not implemented. Given the Medium CO₂ case is intended to represent “expected” future policy, replacing this assumption with a currently articulated future policy (EPA 111(d)) seems the most prudent action for the Medium case. The High case would be intended to explore a future where the cost of compliance is even higher than meeting EPA 111(d). Note that the Social Cost of Greenhouse Gasses price-policy view is mandated under Washington law.
 - i. See the reply to part a) above
 - ii. PacifiCorp currently evaluates candidate portfolios under other price-policy scenarios and will continue to do so. Reporting on each of these is provided in the document and on the data disc.
 - iii. PacifiCorp would be interested to understand what types of calculations Sierra Club would propose. The currently provided emissions output data may be sufficient if the desire is to apply additional emission costs on a post-model basis.
 - iv. Given the number of model runs required, PacifiCorp will be developing portfolios for variants under an MN future. As discussed in response to part ii, these portfolios will be evaluated under all identified price-policy futures. Variant portfolios will not be developed under every price-policy scenario.
- b. Please see responses below:
 - i. Emissions reductions from these technologies are available in practice, and the effective cost per ton of potential emissions reductions from installation of SNCR or SCR can be calculated the model results. Because both SNCR and SCR

technology have little impact on resource operating parameters such as heat rate and maximum output, there would be little impact on system dispatch from including those options in the model.

The model will have an availability to select CCUS (including SCR technology) at each of these locations and can make that selection independent of the selections at other sites, excepting locations where other environmental compliance requirements would prevent continued coal-fired operation:

1. Naughton 1&2 which are currently slated to either gas convert in 2026 or retire
 2. Dave Johnston 1&2 which are currently slated to retire in 2028 with an option to gas convert to continue operating after that date.
- ii. As above, the model will be able to select CCUS (including SCR technology) at the above sites.

6. Resource Availability

- a. Evaluate whether there are resource bids proposed in the 2022 RFP that could be available prior to 2028 and include those resource options in the model

Reply:

- a. Any cluster study/transmission options that are eligible to be in service prior to 2028 will be included as proxy resource options starting in 2027.

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.

Please see attached

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

Please see above

Please submit your completed Stakeholder Feedback Form via email to IRP@PacifiCorp.com

Thank you for participating.

* Required fields

Feedback on PacifiCorp 2025 IRP

Demand Side Management

1. Review of EE Supply Curves

In the May 2, 2024 stakeholder meeting, PacifiCorp provided the following timeline for the Conservation Potential Assessment:

| Timeframe | Milestone | Public Input Request |
|------------------|--|---------------------------------------|
| January 25, 2024 | Present on Scope of Work | Additional input on scope |
| March 14, 2024 | Share Draft EE & DR Measure List | Provide feedback on included measures |
| April 8, 2024 | Finalize Measure List | Feedback incorporated |
| May 2, 2022 | Share Key Drivers of Potential and Assumptions | Review methodology and resources |
| September 2024 | Present Draft Results and Share Measure Data | Review materials and provide feedback |
| October 2024 | Present Final Supply Curves | Review changes made due to feedback |
| November 2024 | Draft CPA for Review | Provide input on draft report |
| January 2024 | Publish Final Report | With feedback incorporated |

This suggests that the EE supply curves will not be available for review until September or October, which may be too late for additional changes prior to being committed as inputs to the IRP modeling. Sierra Club requests that there be sufficient time for review of the EE supply curves and the opportunity to suggest changes prior to modeling. In particular, Sierra Club is concerned about the following potential issues:

- Exclusion of Measures from Supply Curve:* In the Final 2023 CPA Report, the following methodological approach was described:

In general, this study did not consider the cost of energy efficiency measures, as this analysis is performed within PacifiCorp's IRP. However, because, by default, the technical (and achievable technical) assumes that the highest efficiency equipment option will be adopted by all customers at the time of replacement, this has the potential to skew the amount of cost-effective potential. For example, assuming that all customers adopt high-cost SEER 24 central air conditioners would not only create a large amount of high-cost potential that the IRP model would be unlikely to select, but it would also reduce the available potential for lower-cost non-equipment measures that can save cooling load (e.g., insulation). To account for this, the achievable technical potential excluded equipment measures with significantly high upfront costs unlikely to be deemed economic within the IRP. This screening used a levelized cost threshold of \$160/MWh for California, Utah, Idaho, and Wyoming, and a higher threshold of \$175/MWh for Washington to reflect the 10% conservation credit applied within the IRP for measures in that state.

In other words, PacifiCorp's approach was to set an arbitrary cost threshold, above which EE measures cannot even be considered for IRP model selection – even if those measures could be an optimal part of the overall portfolio. Sierra Club disagrees with this approach since it assumes, without any supporting evidence, that higher cost measures would not be selected by the model and should therefore be excluded from consideration. While it is certainly possible that higher cost measures will be selected in fewer quantities, there is no logical basis for initially excluding them from the supply curve, and thus from possible selection in the IRP model. A better approach would be to include all possible EE measure bundles in the supply curve and simply allow the model to select the bundles that minimize cost across the entire resource portfolio.

- b. *Admin Costs:* Measures included in the 2023 CPA assumed administrative costs that were exceedingly high, even up to 48% of the total cost in some cases. Typically, administrative costs for utility EE portfolios are less 10%. For example, administrative costs for Rocky Mountain Power's DSM portfolio in the 2023 program year were approximately 2% of the total portfolio budget.¹
- c. *Incentive Levels:* During the May 2, 2024 PIM, PacifiCorp explained that EE measure costs included an assumed incentive level that varies by state as shown below:

| Field | Washington | California | Oregon | Wyoming | Utah | Idaho |
|-------------------|-------------------|------------|---------|-------------|-------------|-------------|
| CE Test | TRC, 10% adder | TRC | TRC | UCT | UCT | UCT |
| Measure Cost | \$1,000 | \$1,000 | \$1,000 | n/a | n/a | n/a |
| Incentive Paid | n/a | n/a | n/a | \$430 (43%) | \$380 (38%) | \$390 (39%) |
| Utility Admin % | 48% | 45% | 29% | 48% | 22% | 40% |
| Admin Spend | \$480 | \$450 | \$290 | \$480 | \$220 | \$400 |
| Cost for Bundling | \$1,480 | \$1,450 | \$1,290 | \$910 | \$600 | \$790 |

**** Administrative costs will be updated during the 2025 study**

However it is unclear if additional quantities of EE measure bundles can be selected by the IRP model at higher incentive levels. Sierra Club recommends that the model be provided with EE bundles at higher incentive levels -- and correspondingly higher quantities -- as an option for the model to select. This reflects that overall customer adoption of EE measures would generally increase as the level of incentives increases. At a minimum, incentive levels should be set at 75% and 100% of incremental measure costs. Additionally, there is no reason to cap the incentive level at 100% of the incremental cost of the measure. It may be more cost effective from a resource portfolio perspective to increase the adoption of EE

measures, even if that means increasing the incentive levels above 100%. PacifiCorp should consider incentive levels at 125% and/or 150% of the incremental cost of the measure.

d. Additional Flexible Load Options:

Sierra Club appreciates PacifiCorp's consideration of new flexible load options as part of its demand-side resource portfolio. However, Sierra Club recommends that two additional flexible load options be included as part of the overall portfolio.

First, while PacifiCorp has included an Electric Vehicle Direct Load Control, this appears to be limited to one-way managed charging of EVs. In reality, many new EV models – including both LDVs (e.g. Ford F150) and MD/HDVs (e.g. school buses) – are capable of bidirectional charging, often referred to as “vehicle to grid”, “vehicle to building”, “V2X” or “V2G.” These technologies are currently being deployed around the country to serve as a grid resource during times of peak need. This stands to provide roughly twice the grid capacity benefit as simple managed charging, and only a small fraction of EV participation is needed to reach potentially several hundreds of MW of grid resource. Sierra Club recommends that PacifiCorp include this as a resource option in its IRP modeling. Additionally, Sierra Club recommends that PacifiCorp consult with the Vehicle Grid Integration Council on best practices for developing new V2X program opportunities that draw upon lessons learned from other utility programs.²

Third, Sierra Club recommends that PacifiCorp consider new flexible load options for the emerging subset of new large load customers. For example, one data center company has recently reported its ability to temporarily shift computing load based on the needs of the grid.³

e. Treatment of Heat Pump Costs:

Recent technological advances in cold-climate heat pumps, along with incentives offered through the Inflation Reduction Act mean that there should be substantial consideration of this technology as a potential component of PacifiCorp's DSM portfolio. Heat pumps can offer a more efficient form of cooling than traditional AC units or resistive heating. Sierra Club recommends that PacifiCorp consider incremental heat pump costs relative to both a heating and cooling baseline technology. For example, the incremental cost of heat pumps relative to a new AC cooling unit may be substantially less than the incremental cost versus a gas furnace. Additionally, the assumed incremental costs should be informed by recent research on heat pump costs and available federal incentives. Sierra Club recommends that

² <https://www.vgicouncil.org/resources>

³ <https://cloud.google.com/blog/products/infrastructure/using-demand-response-to-reduce-data-center-power-consumption>

Paci❖iCorp incorporate information recently compiled by Cadmus on behalf of PSE for this purpose.⁴ The table below was excerpted from the Cadmus report.

**Table 11. Potential Impact of 25C Tax Credit and HEEHRA
Rebate on Cost of Heat Pumps (80% to 150% AMI)**

| Equipment | Base Cost Estimate | Est. 25C Tax Credit Value | Est. HEEHRA Rebate * | Net Cost |
|---|--------------------|---------------------------|----------------------|----------|
| Centrally Ducted ASHP | | | | |
| Centrally Ducted ASHP – Base | \$14,800 | b | b | \$14,800 |
| Centrally Ducted ASHP – Dual Stage | \$17,175 | b | b | \$17,175 |
| Centrally Ducted ASHP – ENERGY STAR | \$17,800 | \$2,000 ^c | \$8,000 | \$7,800 |
| Centrally Ducted ASHP – Cold Climate | \$19,425 | \$2,000 ^c | \$8,000 ^d | \$9,425 |
| Centrally Ducted ASHP – Dual Fuel | \$11,277 | b | b | \$11,277 |
| Centrally Ducted ASHP + Furnace – Dual Fuel | \$16,250 | b | b | \$16,250 |
| Ductless Mini-Split Heat Pump (assumed 3 tons) | | | | |
| Ductless Mini-Split Heat Pump – Base | \$13,443 | b | b | \$13,443 |
| Ductless Mini-Split Heat Pump – ENERGY STAR | \$14,886 | \$2,000 ^c | \$7,443 | \$5,443 |
| Ductless Mini-Split Heat Pump – Cold Climate | \$15,246 | \$2,000 ^c | \$7,623 ^d | \$5,623 |

Sources: 26 C.F.R. § 25C; An Act to provide for reconciliation pursuant to title II of S. Con. Res. 14, Public Law 117-169 (2022): 1817–2090. <https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf>

^a While this table shows the HEEHRA rebate estimate for residents making 80% to 150% of AMI, residents making less than 80% AMI would be expected to receive the full \$8,000 for all qualifying heat pumps, given the cost estimates used.

^b Equipment is not assumed to meet the efficiency criteria for ENERGY STAR or for CEE Tier 3.

^c Equipment meeting ENERGY STAR or different CCHP specifications may not meet CEE Tier 3 criteria.

^d Equipment meeting CCHP specification may not qualify for ENERGY STAR designation.

2. EE/DR bundles should be included as potential “reliability adjustment” resources.

In the 2023 IRP, Paci❖iCorp’s modeling approach included a “reliability adjustment” step in which incremental resources were added after the initial ST model runs to account for any energy shortfalls. However, the potential set of resource options added to address reliability needs did not include any Energy Ef❖iciency or Demand Response resources. Sierra Club recommends that Paci❖iCorp update its approach to allow EE and DR resources to be added in the reliability adjustment step. Notably, this step is conducted outside of the cost-optimization, and thus there is no need to consider “cost-effectiveness” in the traditional sense. In other words, the addition of supply side resources to address residual reliability needs are agnostic to cost. Similarly, additional reliability-driven EE resources should be considered for inclusion, even if they would not screen a traditional cost-effectiveness test. This would be the only way to consider EE resources on an equal playing ❖ield with supply-side resources. Additionally, Paci❖iCorp should clearly identify all the resources added as part of the reliability adjustment step, including EE/DR resources. To the extent that EE/DR resources are included, Paci❖iCorp should also update its EE/DR implementation plans to

⁴ <https://apiproxy.utc.wa.gov/cases/GetDocument?docID=3616&year=2022&docketNumber=220066>

include these additional reliability-driven EE/DR resources. This might be accomplished by including a “reliability adder” as part of the cost-benefit evaluation, and/or when selecting the level of customer rebate/incentive.

Granularity & Reliability Adjustments

In its comments for the 2023 IRP analysis, Sierra Club has expressed concerns for the manual adjustments performed by the Company to the resource portfolios. Those include reliability and granularity adjustments. While both are addressing real modeling concerns, they do so in a way that is not fully transparent and is excessively impacting the final portfolios. These manual adjustments undermine the role of a modeling process and tool like PLEXOS, while stakeholders spend time reviewing inputs and outputs that in the end are overwritten by the Company’s adjustments.

Granularity Adjustments

For the granularity adjustments, Sierra Club is concerned that based on previous reviews, coal units might be receiving a significant and unjustified adjustment which reduces their fixed cost and could result in keeping uneconomic units online. The example of “swapping” driven by Granularity Adjustments presented during the March 14, 2024 meeting is especially concerning as it shows the impact those adjustments have on the portfolio. For example, between phases 3 and 4 wind grows by more than 75%, which shows the impact that the Company’s out-of-model changes can have on the final portfolios.

During the same meeting, the Company stated that “The Granularity Adjustment reflects the marginal value of the LAST MW of a resource that is added, and in runs that are reliable, this last MW has less value than the last MW in an unreliable run.” This raises concerns with respect to the Company’s modeling process and sequence of steps: if the granularity adjustment is performed prior to the reliability adjustment step, then an energy shortfall could result in an unreasonably high energy value for coal units based on the \$1000/MWh shortfall price. However, that energy shortfall could be addressed during the reliability step significantly reducing the energy value of said coal units. Furthermore, the energy value of coal units is partly determined by the company’s assumed coal prices, which Sierra Club and other stakeholders have expressed concerns about.

Sierra Club provides the following recommendations:

Reporting Recommendations

- Report steps taken to reduce out-of-model granularity adjustments. Explain any differences between the 2025 and 2023 methodology, including whether decreasing fixed cost (slide 44, March meeting) was part of the process in 2023 and if not, how that addition is improving the granularity adjustment process.

- Clearly report methodology, values, and impacts of adjustments. Provide clearly labeled workpapers that include the initial adjustments, and the adjustment values for each iteration, as well as the model results and PLEXOS output files (and a spreadsheet that clearly explains the adjustments and file names of each iteration). For each of the portfolios presented, explain why the iterative process stopped at the final portfolio.

Modeling Recommendations

- Granularity adjustments should primarily be applied to flexible resources, i.e. resources the value of which is not fully captured in the LT model because of the lower temporal resolution: energy storage and peakers.
- Ensure that the energy value of a resource's output in the LT Model and that in the ST model include the same cost components for a consistent comparison. In its Response to Sierra Club Data Request 29 for the 2023 IRP analysis, PacifiCorp noted that "existing plants are no longer capitalizing initial build costs whereas proxy resources do capitalize these items over the study horizon impacting net figures." This statement implies that the granularity adjustment is impacted by whether the unit is existing or a new addition (through the inclusion of initial build costs). However, initial build costs are not relevant for the granularity adjustment which is meant to capture only the flexibility value that the LT model might not be fully capturing because of its lower time resolution. Thus, Sierra Club recommends that for the granularity calculation the energy value should not be net of annualized initial build costs, even for new resources.

Reliability Adjustments

Reliability adjustments also have a significant impact on the final portfolios as the Companies choose to delay, add, or subtract resources. Sierra Club has analyzed its concerns regarding the Company's practice of adding resources and delaying retirements to address the reliability issues, a concern that was shared by Staff in its comments, requesting increased transparency and an effort to reduce the out-of-model adjustments. PacifiCorp has not shared any details about how the reliability adjustments will inform the 2025 IRP.

Reporting Recommendations

- Provide PLEXOS output files for the initial and reliability-adjusted portfolios, as well as a spreadsheet mapping the initial and reliability-adjusted portfolios, together with a list of the resources that have been added, removed, delayed, or in any way adjusted by the Company, and a justification for this choice.

Modeling Recommendations

- Provide details on the rationale and methodology of reliability adjustments during the public input meetings prior to the filing of the draft IRP.
- Provide stakeholders with an opportunity to recommend alternative reliability adjustments. These alternatives should be evaluated in parallel to those selected by PacifiCorp, with an opportunity for revisions and feedback from stakeholders prior to the IRP filing.
- Resources options considered for addressing the identified reliability issues should include renewable energy sources, energy storage, and demand side resources.

Energy Infrastructure Reinvestment (EIR) Program:

In the Commission's Order adapting Staff's recommendations 24-073, the Commission included a recommendation coming from Sierra Club's comments:

#21: In the 2025 IRP/CEP PacifiCorp shall provide an update on PacifiCorp's efforts to secure Energy Infrastructure Reinvestment (EIR) financing from the DOE Loan Program Office. Assume EIR financing through the DOE Loan Program Office in the Preferred Portfolio or include a variant portfolio that optimizes resource additions and retirements under the assumption of EIR financing.

PacifiCorp has not shared any details about how this recommendation will be included in the Company's analysis.

Reporting Recommendation:

- Provide an update on PacifiCorp's efforts to secure EIR financing from the DOE Loan Program Office and any analysis that has been conducted to assess the associated benefits.

Modeling Recommendation:

- Incorporate financing opportunities made available under the EIR program, which can enable the closure of coal plants, the replacement of fossil resources with cleaner alternatives, and the development of transmission infrastructure. Specifically, PacifiCorp should conduct:
 - A scenario in which transmission network upgrade costs in Cluster Areas 1, 2, 4, 12, and 14 are reduced by 30 percent; and
 - A scenario in which EIR financing is assumed for early retirement and replacement of Jim Bridger Units 3 and 4, Huntington, Hunter, and Wyodak. In this scenario the model should be allowed to select the economic retirement of those units assuming EIR financing.

Compliance with the EPA 111(d) rule and CO2 price

In its 2023 IRP analysis PacifiCorp evaluated resources under five price-policy scenarios assuming different CO2 and natural gas prices:

- MN: Medium natural gas/No federal CO2 regulations
- MM: Medium natural gas/Medium CO2 cost
- HH: High natural gas/High CO2 cost
- LN: Low natural gas/No federal CO2 regulations
- SC: Medium natural gas / Social cost of greenhouse gases

For the 2025 IRP, PacifiCorp is lowering the high CO2 forecast for the HH scenario and replacing the MM with a new price-policy scenario:

- MR: Medium natural gas/current federal CO2 regulations, under Section 111 of Clean Air Act

Modeling Recommendations

- Compliance with the EPA 111(d) rule should be modeled as part of the base model, not as a variant or price-policy scenario (MR). The five price-policy scenarios (including MM), as defined in the 2023 IRP analysis can be used, with all of them requiring Section 111(d) compliance of existing coal and new gas resources, while the N, M, H, and SC assumptions will define the CO2 price in addition to the required EPA 111(d) compliance. Specifically:
 - All coal units should be modeled based on three compliance options identified in the August public input meeting:
 - Continued Operations/retirement by end of 2031.
 - CCS by end of 2031, no retirement obligation.
 - Natural Gas/Alternative Fuel: co-firing of at least 40% natural gas or similar emission reductions from an alternative fuel, starting 2030. 100% natural gas or alternative fuel starting 2039. This compliance option should include any conversion costs as well as incremental fuel supply and transportation costs.
 - If new combustion turbines or combined cycle resources are available for selection in the model, they should be compliant with EPA 111(d):
 - CCS by January 1st, 2032 (or other technology option meeting the standard)
 - Operating with an upper limit capacity factor of 40 percent during each year.
- CO2 prices should be included in LT, but the Company should also conduct and report ST results without the carbon cost included in the dispatch decisions.

Reporting Recommendations

- Cumulative carbon costs associated with each portfolio, although not included in dispatch decisions, should be reported through a post-optimization calculation.
- Variants that perform well should have LT runs presented for all price-policy scenarios.

Compliance with the EPA Regional Haze Rule

In August 2024, EPA proposed to disapprove both Wyoming and Utah's Round 2 Regional Haze State Implementation Plans (SIPs). EPA's final decision on Wyoming and Utah's SIPs are expected by November 22, 2024. In EPA's proposed disapproval of Wyoming's SIP, EPA faulted Wyoming for failing to consider pollution emission reductions from some of the state's largest sources, including Jim Bridger, Wyodak, Naughton, and Dave Johnston. This indicates that pollution controls are likely to be required at PacifiCorp's Wyoming coal fleet. At a minimum, it indicates a regulatory risk that controls will be required. PacifiCorp should factor this risk into its long-term planning, where the Company examines a variety of possible futures.

In EPA's proposed disapproval of Utah's SIP, EPA stated that "[s]ince installing SCR at Hunter Unit 3 would achieve significant emissions reductions at a cost of \$4,401/ton (below Utah's \$5,750/ton cost-effectiveness level) and the State did not address this issue in its SIP submission, we find that Utah unreasonably rejected SCR for this unit." EPA also stated, "[t]he information in the record indicated that installation of SCR, at an estimated cost of \$5,979-\$6,533/ton NOx reduced, may well be cost-effective for Hunter Units 1 and 2 and Huntington Units 1 and 2 (or some subset of these units)." Accordingly, there is also regulatory risk that SCR will be required at all five units at Hunter and Huntington, which should also be accounted for in PacifiCorp's IRP.

Modeling Recommendations

- As part of the base model (i.e., included in all portfolio runs), include an SCR requirement at Hunter 2, Huntington 1 and Huntington 2. Additionally, require that the model select either SCR or SNCR at Naughton, Wyodak, and Dave Johnston 1, 2, and 4.
- As a variant case, include an SCR requirement at all five units at Hunter and Huntington, while keeping the same modeling assumptions at the Wyoming units.

Resource Availability

During the July public input meeting, PacifiCorp presented modeling details around supply side resources, including energy storage, solar, wind, geothermal, nuclear, and gas turbines. Energy storage and solar are assumed to have a 12 month construction duration while

onshore wind a 12-24 month construction duration. The soonest commercial operation date possible for the three resource types is assumed to be 2028. However, there might be resource bids proposed in the 2022 RFP, which could be potentially available prior to 2028. Sierra Club recommends that any such resources are identified and included as resource options in the model.