

PacifiCorp - Stakeholder Feedback Form

2017 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 2017 IRP, including, but not limited to the process, assumptions, and analysis. In providing your feedback, PacifiCorp requests that the stakeholders identify whether they are okay with the Company posting their comments on the IRP website.

Yes No May we post these comments to the IRP webpage? Date of Submittal 9/14/2016

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City: Oakland State: CA Zip: 94612

Public Meeting Date comments address: 8/25/2016 Check here if not related to specific meeting

List additional organization attendees at cited meeting: [Click here to enter text.](#)

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

1. Baseline Method and Assumption for Clean Power Plan Compliance
2. Core Scenarios for Regional Haze Compliance and Least Cost Planning

Check here if any of the following information being submitted is copyrighted or confidential.

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

Environmental stakeholders respectfully submit the following recommendations to PacifiCorp in the development of the 2017 IRP scenarios and cases. These comments center around two recommendations: The first pertains to PacifiCorp's baseline Clean Power Plan (CPP) assumptions to be used in common across all core case scenarios; the second recommendation is specific to a set of core case scenarios that PacifiCorp should run to demonstrate system-wide least-cost planning.

1. Baseline Method and Assumption for Clean Power Plan Compliance:

Background: According to PacifiCorp's September 8th Portfolio Development Detail presentation, regional haze scenarios will be analyzed among six different market price and GHG policy scenarios. Of the company's two GHG policy scenarios, the second ("CPP Mass Cap B + CO2 Price") raises particular concern as it uses two simultaneous and non-equal constraints: a mass based constraint and a CO2 price assumption. The use of two simultaneous constraints on the same variable (CO2) means that only one of the two constraints will be binding, and this approach unnecessarily complicates the analysis and end results. While the slide is ambiguous in the application of these constraints, we would be extremely concerned if PacifiCorp intended on applying the mass-based constraint to its own system in System Optimizer (SO) but applying the CO2 price to the AURORAXMP study region (the "AURORA region"). Convoluting these

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two constraints would seriously bias PacifiCorp’s analysis by providing an incentive for PacifiCorp’s units to export well above realistic limits. Given recent gas price futures (including those forecast by PacifiCorp), a CO2 mass-based cap applied regionally is likely to result in relatively low CO2 prices with EPA’s current mass-based targets – well below the ~\$22 to \$86/ton proposed by PacifiCorp. If PacifiCorp uses these elevated CO2 prices to generate regional electricity market prices (in Aurora) but uses EPA’s mass-based cap in its own system (in SO) it will inevitably show regional market prices well in excess of PacifiCorp’s marginal cost, resulting in excessive (and incorrectly derived) market sales. It would, in fact, imply that the CO2 constraint is far less stringent in PacifiCorp’s territory than elsewhere, allowing PacifiCorp to “leak” into the region. To ensure that the wider system is consistently modeled with PacifiCorp’s system, to simplify the modeling assumptions, and to connect CO2 allowance prices with changes in gas prices, we strongly recommend that PacifiCorp use a simple and consistent mass-based modeling approach throughout the region and PacifiCorp system in the reference case and all sensitivities.

Recommendation: PacifiCorp’s reference case modeling of the Clean Power Plan should comprise a western-regional mass-based CO2 emissions cap applied to both existing affected sources and new sources as covered by the CPP’s new source complement. (This recommendation does not supersede environmental stakeholders’ recommendations to model sensitivities in which the Clean Power Plan is strengthened or in which western states enact more stringent carbon regulations.)

Details: In AURORAXMP regional modeling, PacifiCorp should assume that the entire AURORA region (i.e. the region for which wholesale electricity system costs are modeled in the Aurora) follows EPA’s mass-based goal for existing units with the CPP’s new source complement to prevent leakage. The model should assume that all states in the region are able to freely trade mass-based CO2 allowances. To the extent feasible, PacifiCorp should apply this cap to existing sources and new affected sources applicable to the new source complement, rather than all sources. PacifiCorp should assume that, in the base case, the goal is maintained at the 2030 target through the remainder of the analysis period. PacifiCorp should model the AURORA region under the mass-based cap for each of its gas price sensitivities, generating a shadow price of CO2 in each year of the analysis. For the purposes of this analysis, this shadow price will represent the market clearing price of CO2 allowances on the open market.

For the purposes of modeling within System Optimizer (SO), PacifiCorp should use the market clearing price of CO2 allowances as an emissions price applicable to affected units and new combined cycle units (i.e. impacts short-term variable cost). There should be no other CO2 targets or costs established within SO aside from this mass-based target.

For the purposes of evaluating the present value of revenue requirements (PVRR), PacifiCorp should assume that it is freely provided a share of each state’s EPA-allocated allowances on the basis of 2012 emissions, and explicitly track the costs of emissions and revenue from allowances allocated by the state.

2. Core Scenarios for Regional Haze Compliance and Least Cost Planning

Background: Despite extensive conversation and concern raised by stakeholders in the last public input meeting, PacifiCorp re-affirmed that it “will not allow endogenous coal unit retirements” in the 2017 IRP (September 8th Portfolio Development Detail presentation). PacifiCorp provided five different reasons that endogenous coal retirements would lead to inaccurate results, each of which is easily rebuttable.

- a) Coal contract liquidated damage clauses triggered by early closure are only applicable to a subset of PacifiCorp’s units, and in each case the penalty cost in each potential closure year can be calculated readily and precisely. The annual cost of early termination for an existing contract is knowable, and would simply represent an incremental cost of closure. Within the SO model, PacifiCorp has a pre-existing methodology to incorporate the recovery of stranded costs and closure costs into the cost of coal plant retirement. PacifiCorp could simply

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update this mechanism to incrementally incorporate coal contract liquidated damage costs. Please note: environmental stakeholders expect that PacifiCorp will not, under any circumstance, assume any penalties at Huntington should the unit cease burning coal pursuant to the Company's assertions in Oregon UM-1712.

b) Run-rate mine costs apply only to the coal mines owned and operated by PacifiCorp, now limited to Bridger Coal Company. PacifiCorp has demonstrated that it can re-vamp life-of-mine plans at BCC relatively rapidly, and an interpolation between short, medium, and long term mine plans (as already envisioned in the Company's proposed Regional Haze Cases) should suffice to produce order-of-magnitude cash coal cost and capital estimates for BCC.

c) Plant run-rate capital and O&M costs that are held in common across units represent a relatively small minority of the costs of operation. According to PacifiCorp's assumptions in the 2015 IRP, the distribution of common plant costs across remaining units represents a small fractional increase in the total O&M of the remaining units. These are reasonably approximated using a pro-rata share approach as a first approximation.

d) Long-run plant run-rate capital and O&M costs that are avoidable through the early retirement of a unit represent very small dollar figures relative to annual run-rate capital and O&M costs. According to PacifiCorp's assumptions in the 2015 IRP, early retirement of a unit saves a very small percentage of base O&M costs. In PacifiCorp's approximation, these may effectively be ignored for large-scale planning.

e) The company has not confirmed with EPA whether EPA could legally approve PacifiCorp's proposed intertemporal trade-off compliance alternatives as compliant with existing state regional haze rules. Instead, these scenarios simply represent options devised by PacifiCorp. As such, these alternatives do not represent a reasonable base case from which PacifiCorp should evaluate the system.

The solutions discussed in (b), (c), and (d) represent approximations that could, at a maximum, amount to analysis errors on the order of magnitude of tens of millions of dollars (PVRR), depending on the number of individual units retiring at multi-unit plants. These approximation errors are substantially smaller than the very large and coarse-scale heuristic approach proposed by PacifiCorp in the "Regional Haze Scenario" mechanism. PacifiCorp's mechanism will fail to identify both if individual units are economically viable and the optimal year for retirement.

Previous analyses performed by PacifiCorp have revealed that decisions to retire or retrofit certain units in a timely fashion are decisions worth hundreds of millions of dollars. In aggregate, the regional haze scenarios proposed by PacifiCorp will prevent least cost planning – at a cost of hundreds of millions to potentially billions of dollars – all to avoid making approximations smaller by at least one or two orders of magnitude. This represents a substantial error in planning, particularly as PacifiCorp's process is well equipped to follow this recommendation with very little incremental labor cost.

PacifiCorp's modeling mechanism is capable of performing economic system modeling with endogenous coal retirement. In fact, PacifiCorp used this mechanism in its 2013 IRP, and set up the 2015 IRP with the same framework, but then inexplicably disabled it later. By moving away from endogenous coal retirement, PacifiCorp denies stakeholders and regulators the opportunity to assess whether a lower cost outcome is available through the orderly retirement of PacifiCorp's existing coal resources.

Recommendation: PacifiCorp should provide at least three full endogenous retirement scenarios assuming the SCR and gas conversion requirements from the 2017 proposed reference case (i.e. known EPA requirements), run with system-wide mass-based compliance and PacifiCorp's range of gas price forecasts (low, mid and high).

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In the alternative, rather than enabling endogenous retirement, PacifiCorp can provide forty-two (42) scenarios, three gas-price scenarios for each combination of retire/retrofit for the seven coal units with SCR requirements (see Regional Haze Cases, 2017 IRP Ref. Case). From these, PacifiCorp could advance three coal base cases (for the three gas price scenarios) with the combination of surviving units maintained.

Details: Following the primary recommendation, in the endogenous coal retirement scenarios, PacifiCorp should use its existing framework and simply enable endogenous retirement, modifying the few coal plants with long-term coal contract liquidated damages as required, as noted above. This effort would require minimum incremental effort on the part of PacifiCorp's modeling team, relying on a system already in place from the 2015 IRP (yet not enabled). If required, PacifiCorp could review the outcome of these endogenous retirement scenarios and modify the costs of the retiring or surviving coal units as necessary to ensure accuracy in run-rate coal mine costs, as well as run-rate capital and O&M costs, but retaining the timing of retirement calculated by System Optimizer. Ideally, this endogenous retirement capability is retained for all scenarios, including where PacifiCorp reviews alternative capital costs for renewable resources or alternative carbon obligations. Failing that, the retirement schedules calculated by SO should inform the core cases of the IRP.

In the alternative, PacifiCorp should run forty-two (42) scenarios – representing pairs of retire/retrofit decisions for each of the seven coal plants considered with SCR decisions, across three different gas price scenarios. Each pairing would result in the decision to retrofit or retire a single coal unit in the year it otherwise would require the SCR retrofit. The least cost plan for each gas price scenario would then entail the use of only the coal units assessed to be least cost on a one-off basis.

The stakeholders recommend, for the sake of efficiency, re-enabling the native endogenous coal retirement capability of SO. We note that not using the endogenous coal retirement capacity of SO could be perceived as a failure to evaluate all resources on a consistent and comparable basis, and would arguably fail to select a portfolio of resources with the best combination of expected costs and associated risks. The proposal offered by PacifiCorp will not result in the selection of the optimal set of resources given the expected combination of costs, risk and uncertainty.

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.

[Click here to enter text.](#)

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

[Click here to enter text.](#)

Thank you for participating.