

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 7/14/2016
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Public Meeting Date comments address: [Click here to enter date.](#) 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) Renewable energy portfolio standard compliance and renewable energy credit prices
- 2) Existing resource valuation and modeling unit retirements
- 3) Modeling of restrictions on carbon dioxide emissions
- 4) Treatment of PacifiCorp's potential integration into the California Independent System Operator (CAISO) system and the potential expansion of the Energy Imbalance Market (EIM)
- 5) Energy storage

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.

- 1) Renewable energy portfolio standard compliance and renewable energy credit prices
PacifiCorp should model Renewable Portfolio Standard (RPS) within the System Optimizer (or other capacity expansion) framework.

PacifiCorp's 2015 IRP Update includes a discussion of the Company's compliance position with respect to the RPS policies in the states of California, Oregon, and Washington. PacifiCorp will have a shortage of Renewable Energy Credits (RECs) in all three states if it takes no action from the present day. The IRP Update describes the Company's planned compliance strategy as consisting entirely of bundled or unbundled REC purchases.

The Company's discussion and analysis of its RPS compliance position lies completely outside of its modeling and scenario analysis. By separating these two analyses, PacifiCorp's IRP cannot evaluate if the acquisition of market RECs, buying RECs from existing DG customers, or building new renewable energy projects are least-cost, least-risk. PacifiCorp did not include a forecast of REC prices and did not test whether resource procurement or a self-build option would be more cost-effective on a system basis than REC purchases. Even assuming bundled RECs are purchased in Oregon (as per the Company's proposal here), the Company's analysis does not appear to account for the energy component of the bundled RECs, nor is the provenance of unbundled RECs purchased for compliance in Washington and California discussed.

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Overall, the analysis proposed by the Company implies that the RPS has little or no impact on its portfolio development, including both the use of its existing resources and its selection of new resources. This implication is antithetical to the goal of RPS policies. Specifically, Oregon SB 1547 requires that the Company develop an RPS implementation plan to be integrated into the IRP framework for the purposes of planning for the least-cost, least-risk acquisition of resources and that the Company use the plan to determine if the costs of constructing a facility or acquiring RECs are consistent with least cost planning (Oregon Revised Statute 469A.075.6(4)(c) and 469A.075.6(5)).

At the time of the publication of the 2015 IRP Update, the Company stated that it was planning to issue RFPs to investigate the relative costs of REC purchases versus procurement of new renewable resources, and that the bids received in response to these RFPs would allow PacifiCorp to form current expectations of REC and renewable resource prices. Those RFPs have since been issued and the bid selection process will be concluded on or about 15 July, 2015. We therefore expect the results of the RFP process to be included in the 2017 IRP stakeholder process.

Sierra Club recommends the following for the 2017 IRP process:

- a) The 2017 IRP stakeholder process and IRP should discuss the results of PacifiCorp's investigation of the relative costs of REC purchases versus procurement of new renewable resources.
- b) PacifiCorp's system modelling should explicitly test the cost-effectiveness of REC purchases and the acquisition of new renewable energy projects as paths to compliance.
- c) PacifiCorp should also identify the likely origin of purchased RECs and model the system impacts of the energy associated with those RECs.

2) Existing resource valuation and modeling unit retirements

PacifiCorp should re-incorporate endogenous coal unit retirements into its modeling framework under all base case scenarios.

In its 2011 and 2013 IRPs, PacifiCorp pioneered the use of integrated system modeling to investigate the cost-effectiveness of existing resources. Proof-of-concept tests were conducted for the 2011 IRP and expanded for the 2013 IRP, in which "endogenous" retirements of existing units were allowed in the Company's main scenario analysis. PacifiCorp's 2013 modeling framework independently chose whether or not to retire units based on their forward looking values. Endogenous retirements were allowed for all coal-fired units in PacifiCorp's fleet. Modeling of endogenous retirements included an evaluation of decommissioning costs, recovery of new capital, and other costs associated with early unit retirement (2013 IRP, Table 7.1).

PacifiCorp's early retirement studies were crucially for evaluating the value of existing resource in the face of low energy prices, low gas prices, and impending environmental regulations. Critically, the 2013 IRP revealed that under a (then) low forecast of gas prices and "high" CO2 prices, almost the entirety of the PacifiCorp coal fleet would be rendered non-economic. Sierra Club commented at the time that this modeling indicated that a finer examination was warranted to determine risk thresholds and inform long-term decision making. In the 2015 IRP, however, PacifiCorp largely abandoned the concept of endogenous coal retirement studies, and made substantial decisions about unit fates outside of the modeling framework, and with no transparency.

A coalition of stakeholders including the Sierra Club commissioned a modeling study that did allow for endogenous early retirements of existing units. The results of this study were similar to the results of the early retirement studies in the 2013 IRP: both indicated that many units in PacifiCorp's existing coal-fired fleet were of near marginal value. In the absence of rapidly growing load and stable market prices, the purpose of an IRP is to seek mechanisms of providing least-cost, least-risk energy to consumers. Without a doubt, the highest cost and highest risk decisions facing PacifiCorp relate to the disposition of its existing coal resources. PacifiCorp's IRP cannot meet regulatory requirements without a thorough and transparent examination of its existing resources.

Concerns expressed by PacifiCorp about "the details of modeling early retirement" do not merit disposal of a critical analysis. Such analyses cannot be discarded simply because they are difficult or involve uncertainties. Specific considerations associated with coal contract terms, shared resources, and recovery of capital costs can be treated carefully and explicitly.

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In the 2015 IRP and IRP Update, PacifiCorp has substituted confidential retirement assessments of individual resource, in which specific choices are tested or justified. While useful as independent analyses, these studies do not help regulators understand what PacifiCorp's system might look like under different economic circumstances, or if PacifiCorp is even pursuing an economically efficient framework in the first place. As such, PacifiCorp's disavowal of endogenous retirement studies hinders reasonable decision-making.

Sierra Club recommends that the 2017 IRP process re-incorporate endogenous coal unit retirements under each and every case examined, except in circumstances where an individual unit decision is under consideration.

3) Modeling of restrictions on carbon dioxide emissions

PacifiCorp should evaluate a range of CO2 restrictions, or prices, on its system over the long run.

PacifiCorp should continue to model its system with the baseline assumption that federal regulations for the emissions of CO2 under the Clean Power Plan will be implemented. Further, the study should examine a range of stringencies over the medium to long term (i.e. after 2025), along the lines of the following:

- Rule maintained (status quo, as published)
- Incremental compliance obligation (extended on its 2022-2030 trajectory past 2030)
- Strengthened standard (replaced with a stronger rule in 2025 or 2030).

In the 2015 IRP, the Company was hamstrung by a refusal to model anything but a single form of rate-based compliance with the proposed CPP, generally excluding mass-based compliance but for two sensitivity cases. In the 2015 IRP Update, the Company has moved to modeling mass-based compliance using a restriction on emissions, rather than a regional emissions price.

Sierra Club recommends that, for the 2017 IRP, PacifiCorp should:

- a) Clarify the exact compliance mechanism or mechanisms it is modeling, including how it calculated the value of emissions caps or carbon prices;
- b) Clearly identify the cohorts of units that face emissions restrictions or prices;
- c) Elaborate on whether or not its modeled compliance paths include trading and if so, among whom and what form of trading regime is modeled. If a trading price is realized, the clearing price should be disclosed;
- d) Model a range of compliance obligations, from status quo to incremental compliance obligation to strengthened standard;
- e) In the case of a mass-based plan scenario, demonstrate that Pacificorp's compliance plan does not result in higher emissions from new sources not covered by the Clean Power Plan than would occur under rate-based compliance. Alternatively, if Pacificorp does expect emissions to be higher from new sources under a mass-based scenario, Pacificorp should discuss how it expects states will meet EPA's requirement to demonstrate that the state has minimized "leakage" to new sources, as that term is defined in the Clean Power Plan.
- f) Discuss how its compliance position may vary by state, including how it plans to incorporate state goals for states where its units represent just a fraction of state emissions;
- g) Justify any assumptions relating to its ability to follow a preferred compliance plan in states where it is not the only utility.

4) Treatment of PacifiCorp's potential integration into the California Independent System Operator (CAISO) system and the potential expansion of the Energy Imbalance Market (EIM)

PacifiCorp should model their system as integrated into the CAISO market or, at a minimum, clarify the impact (if any) of the integration on long-term modeling.

In April of 2015, PacifiCorp signed a Memorandum of Understanding with the California Independent System Operator (CAISO) indicating the two groups' intent to study the benefits of PacifiCorp joining the CAISO system. Because this Memorandum was signed shortly after the 2015 IRP was filed, the 2015 IRP and IRP Update do not discuss PacifiCorp's potential integration into CAISO. In the 2017 IRP process, PacifiCorp should clarify what it expects the effects of such an

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integration to be on its planning process, as well as specifically on its reserve margin, system costs, and resource decisions going forward. In addition, PacifiCorp should note how it expects dispatch of its resources to be affected by California's restriction on carbon emissions.

Finally, the 2015 IRP notes that several other utilities have expressed interest in joining the EIM to PacifiCorp. PacifiCorp should clarify whether or not it expects other utilities to join the EIM and whether its potential integration into CAISO affects this expectation. If PacifiCorp expects other utilities to join the EIM, it should explain how it plans to model the inclusion of these other utilities in the 2017 IRP and what it expects the impact of an expanded EIM to be on its planning and resources going forward.

PacifiCorp should indicate whether or not it plans to include such an integration in its modeling for the 2017 IRP. If so, PacifiCorp should elaborate on how it plans to model CAISO integration, including tools and assumptions used for such modeling. In particular, PacifiCorp should clarify how it plans to model California's price on carbon emissions (for example, whether or not PacifiCorp plans to include a surcharge representing the California carbon price on emitting generation imported into California and, if so, how such a surcharge will be represented and with what price over time). PacifiCorp should also note how it expects California's emission market to interact with its carbon reduction obligations under the Clean Power Plan and how it plans to model such interactions.

Sierra Club recommends that, for the 2017 IRP stakeholder process, PacifiCorp should:

- a) Clarify the expected impacts of the CAISO merger on the planning process, reserve margin, system costs, and resource decisions;
- b) Clarify if and how the Company anticipates accounting for (or not) California restrictions on emissions from imported power;
- c) Indicate if the addition of other western utilities changes how PacifiCorp's long-term model is treated; and
- d) Elaborate on if the merger will be modeled, and if so, how.

5) Energy storage

PacifiCorp should review and update the mechanism by which energy storage is modeled in the 2017 IRP.

PacifiCorp updated its cost assumptions for batteries in the 2015 IRP Update (Table 4.3), based on data from the Department of Energy's Energy Storage Exchange (ESE). However, PacifiCorp does not appear to have updated its approach to modeling battery energy storage and its benefits. PacifiCorp's updated preferred portfolio contains no battery storage.

We suggest a number of modifications to how PacifiCorp considers energy storage for the 2017 IRP. PacifiCorp should provide full source data for the comparable project costs it is using as input data, including the location, size, and supplier of projects included in the dataset. While it is helpful for PacifiCorp to provide its battery cost assumptions in both \$/kW and \$/kWh, estimates should ideally be broken out into cell (\$/kWh) and balance-of-system (\$/kW) costs as these values scale differently. Providing separate cell and balance-of-system costs, as well as total system cost estimates, would allow for a more thorough understanding of the optimal size of potential battery systems to be added to PacifiCorp's system.

The representation of battery technology within System Optimizer used for the 2015 IRP and IRP update is inadequate. By only allowing batteries to be sized in increments of 1 MW, PacifiCorp neglected the precision that can be achieved in battery system sizing. Southern California Edison, for example, recently completed an RFO process that resulted in the procurement of multiple battery systems ranging between 500 kW and 100 MW in size. Modeling for the 2017 IRP should use a smaller block size for battery systems, such as 100 kW, to allow for an improved determination of the optimal size of battery systems. PacifiCorp should also clarify how it plans to represent batteries with varying discharge times within the System Optimizer framework.

Furthermore, PacifiCorp's reliance on System Optimizer results as its only indication of whether or not batteries are part of a least-cost portfolio is inappropriate. The level of temporal and locational specificity in System Optimizer is

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insufficient to capture many of the benefits of grid-connected batteries. For example, System Optimizer cannot model sub-hourly behavior of resources, meaning that it cannot capture the value provided by batteries used for frequency regulation or voltage support. Similarly, System Optimizer cannot incorporate the possible transmission or distribution system upgrade deferral or congestion relief benefits of batteries, which depend highly on the exact location of a battery system on the grid.

Sierra Club requests that PacifiCorp create a working group on modeling storage systems and capturing the benefits of storage in the IRP.

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.