

PacifiCorp - Stakeholder Feedback Form

2019 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 2019 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 3/26/2019

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Public Meeting Date comments address: 9/27/2018 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.

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.

Below are slide-by-slide comments and questions, working from the hard copy slides provided (28-slide PAC presentation).

A note on process: As most of the participants have acknowledged, the interest of getting good analysis included in the slides has to be balanced with providing lead time with meeting materials. This balance continues to be a challenge for Pacific Power. One business day of lead time is a significant improvement over no lead time, but is still insufficient if the company views in-person participation as the most efficient venue for hearing and responding to questions and feedback.

Slide 4: I understand the reasoning behind opening up the shoulder seasons for more FOTs. I am unclear on how the risk that goes with relying on transmission might is represented in the modeling (though the risk may be similar for the peak seasons as well). I feel like I should know this, but at what point in the IRP process does PAC perform a loss-of-load-probability or N-1-1 type of study?

Slide 6: Is Lewis River currently operated to maintain 10% reserve capacity? Is doing so cost-effective relative to other options? I appreciate that PAC may make a justifiably conservative decision to hold flexible resources in reserve during a peak event, even if that resource is not the lowest-cost.

Slide 6: I am not familiar enough with PaR's inner workings to understand the pros and cons of the out-of-model battery optimization. If the company is willing, I would appreciate an orientation on PaR, perhaps in person or as a webinar. What variables are hardcoded inputs? What variables move around when PaR is run as a stochastic model? I as

* Required fields

surprised to learn during our discussion on Slide 8, for example, that wind and solar generation are inputs, and are fixed. What are the limitations of using PaR deterministically as a gauge for system reliability?

Slide 7: Another PaR-related remedial question - Intuitively, I would think that the net load valleys are also the periods of lowest-cost power. Is this always true? Is charging during the valleys the optimal time to charge from a cost perspective, or a reliability perspective, or both? Might this answer be different for summer vs for winter?

Slide 8: Batteries are modeled to hold 12.5%, or 30 minutes of full discharge capacity, at all times. Why? Is this simply a modeling assumption reflecting a reasonably conservative buffer that would likely reflect conservative operating behaviors?

Slide 9: What is the scale of the problem between SO and PaR PVRR estimates, and when are these divergences happening in the 20-year horizon?

Slide 10: We had a good conversation about PAC's progress on exploring other modeling options. If there was one take-away from this meeting, it's that the current tools are not suited to the tasks this IRP requires of them. SO and PaR are struggling mightily to project a believable vision of a future that includes large amounts of solar and storage. It seems to me that most of the work performed so far for this cycle is figuring out workarounds and adjustments to the limitations of SO and PaR.

Multibillion dollar decisions based on models can only be reasonable if the IRP's modeling tools provide reasonable projections. I strongly encourage the company to a) continue pursuing new tools with all deliberate speed, and b) include an update and narrative discussion of PAC's plans with regards to its modeling tools in the final IRP.

Slide 12: I appreciate the company's efforts to adjust the values of solar and wind in SO to disentangle the rough averages used in SO from the more granular matching of price and production that can be seen in PaR (though I was surprised that this seemed to meet little resistance relative to the operating reserve credit proposed last year). I'm still a bit unclear on how the figures in the table were calculated. Please describe how these values were determined. Also, it's unclear whether the averages reported vary much across the 20-year planning horizon. Please provide these values for a few sample years - say, 2022, 2025, 2030 and 2035 - to provide an view into how the SO-to-PaR valuation divergence changes over time.

Slide 13: I'm still puzzled by whether this adjustment is intended to solve the reliability problems IDed in PaR, or if it is intended to solve the valuation mismatch due to the granularity issue, and including the value has the added effect of improving the reliability problems. Also, for consistency, is this adjustment a Granularity Adjustment or a Cost-Driver Adjustment?

Slide 15: This question connects to my slide 13 comment. If this iterative process is able to use SO's mathematical optimization to select additional reliability resources and cover the shortfall IDed in the deterministic PaR run, is it necessary to include a granularity adjustment? It seems like either approach results in a similarly-optimized portfolio (with tweaks), but I think I'm missing something. Perhaps a comparing PaR estimates for portfolios constructed with and without the adjustment, both following the same workflow including the forced additions for reliability, would help answer this question.

Slide 20: Two portfolio case requests --

A. To align with the earliest requirement of the prospective WA clean energy bill being considered by the legislature, please add a case analyzing the economics of closing WCA coal assets (all Bridger and Colstrip units) by 2025.

B. WA and OR are both considering laws that would implement a cap-and-trade policy that could integrate with California's larger market. Please include a carbon price scenario based on price forecasts for the California-Quebec cap-and-trade program. I believe ABB has access to these price forecasts.

* Required fields

Slide 21: I am still in the early stages of building the knowledge base needed to provide useful feedback on the topic of transmission. A colleague from WY mentioned that PAC prepared an overview of transmission that was helpful. Please provide this and any other materials that may aid my educational efforts. Based on other reactions in the meeting, I believe I may not be the only one who could benefit from this primer. I will also review materials from OPUC's transmission workshops.

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.

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

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- Check here if you do **not** want your Stakeholder feedback and accompanying materials posted to the IRP website.

Thank you for participating.