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 9/7/2018

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Public Meeting Date comments address: **8/30/2018** ☐ 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.

All - WUTC staff intends to file feedback after each IRP meeting to keep the lines of communication open and to signal as soon as possible whether there are any concerns. Below are slide-by-slide comments and questions, working from the hard copy slides provided (33-slide Navigant presentation; 81-slide PAC presentation).

Private Generation slide deck:

- Slide 9: Is it reasonable to assume that other states won't catch up with UT's current market maturity? A fairly consistent difference between residential UT solar costs and non-UT solar costs may be accurate, but is not intuitive. What evidence is there to support this finding?

PacifiCorp Response:

PacifiCorp assumes relative market maturity will not change. Looking at the high penetration scenarios, with the exception of Oregon in the latter half of the forecast period, the other states do not show the market penetration Utah has today. Given the relatively small markets in the PacifiCorp service territory outside of Utah and the corresponding commercial opportunity, Navigant assumes the likelihood that major players in the solar industry will enter a market and establish a supply chain similar to ones in place in larger markets is low. Given the limited resources other, more attractive, markets are likely to take priority leaving mostly local players leading the market. Sensitivity to high and low costs is captured in the scenario analysis.

- Slide 17: I echo others in their implied requests for more background on what component of the model flips such that the slope shifts dramatically for all states between 2031 and 2032.

PacifiCorp Response:

There is no specific component that "flips" in the model causing a change in adoption rates. The reason is related to the interplay between all the inputs. The increase in annual adoption rates is related to Utah (starting 2032) and

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Oregon (starting 2029). The other states do not have a significant departure from annual adoption rates observed throughout the forecast. The reason for the increase in those years is related to customer payback improvements. After the reduction/elimination of the federal Investment Tax Credits (ITCs) it takes time for the economics to catch back up to the levels seen prior. Once that occurs the adoption rates start improving again.

- Slide 25: I understood from the discussion that this study does not contemplate community solar. How does PAC incorporate those projects into their IRP? Are there any interactive effects between community solar and the outputs of this study such that using this study as an input may cause significant issues?

PacifiCorp Response:

Community solar resources in Utah are treated as existing resources in our model. Oregon rules regarding community solar are still under development. The Integrated Resource Plan (IRP) group will continue to monitor and address developments in this area as applicable, in future IRPs.

- Slide 28: Discussion highlighted that UT incentives as listed in this slide may not match actual UT policy. Please provide an update on whether that's the case, and if so, whether the graphs provided here change significantly because of the corrected UT residential PV incentives.

PacifiCorp Response:

The incentives modeled in the draft report were inaccurate. They have been corrected and the results contained in the final version of the report reflect the current Utah incentive structure. Only minor changes are observed in the findings and the final report will be posted on PacifiCorp's Integrated Resource Plan webpage once it is available.

- General comment on study: One of the other stakeholders noted that PAC could decide to engage customers to move this forecast if it wanted. For example, if PAC's model runs show that, all else held constant, a high private generation curve leads to a lower PVRR, that may be a good reason for PAC to nudge the market where it can, and where it is cost effective. This concept is worth exploring in the context of the IRP, even if the conclusion is that PAC should not do more than whatever regulations require.

PacifiCorp Response:

PacifiCorp appreciates the comment and may consider the results of the high private generation sensitivity accordingly. As PacifiCorp does not have direct control in achieving assumptions under this scenario it is reasonably studied as a sensitivity.

PAC's slide deck:
- Slide 7 (kind of): this is unrelated to the slide, but the discussion prompted a question about EVs as a part of the load forecast. Does PAC plan to identify or isolate the EV portion of its load forecast? Are you able to, and do you plan to perform a sensitivity on, for example, how high EV adoption rates in the 5-10 year timeframe would affect the system? A variable outside of PAC's control – say, EV price reductions or range improvements – could have an outsized impact on the system.

PacifiCorp Response:

In so much that historical sales to current electric vehicle (EV) owners are informing the forecast, EV load is currently captured and reflected in the 2019 Integrated Resource Plan (IRP) load forecast. Given the negligible share of PacifiCorp's load comprised by EV, the Company does not plan to explicitly forecast the load associated with electric transportation for the 2019 IRP.

- Slide 9: I understand that some feedback on the CPA was received but not yet integrated into the current draft CPA or the slides. Please provide an update on this open issue.

PacifiCorp Response:

Stakeholder feedback forms are posted on the Integrated Resource Plan webpage, a summary of feedback by topic is being developed and will be posted by October 31, 2018. In addition, feedback received and incorporated was part of the ongoing discussion on the Conservation Potential Assessment (CPA) at the September 27-28, 2018 public input meeting.

- Slide 10: I'd like to reiterate my concerns with the DSM cost bundles. The bundles remove a level of granularity on both price and load shape in a way that will always compromise the IRP tools' DSM selections. I appreciate that PAC has to make some amount of simplifying assumptions, but the degree of inaccuracy and its impact on the final selections is still an open question. Whether this is within an acceptable is an open question that PAC should be able to analyze and discuss. Some half-baked suggestions:

o Bigger bundles in the low and high end (IE $0-20, $20-30, $170-200) to allow more granularity where the bundles start competing directly

o Bundling by load shape – perhaps DSM measures that have an outsized impact on coincident peak would be selected at $70, while DSM measures which don't affect peak much may not be cost effective even at $30
o Aggregating DSM bundles by state, or having system bundles in the very low end

PacifiCorp Response:

PacifiCorp has received feedback regarding demand-side management (DSM) cost bundles and plans to incorporate in its 2019 Integrated Resource Plan a portfolio that considers DSM bundles by capacity.

- Slides 11-16: PAC and the consultants did a good job highlighting and explaining the differences among the states.
- Slide 13: WA commission staff have seen figures for a study – which I believe PAC participated in – on the health-related benefits of displacing wood due to lower particulate matter (PM 2.5) levels. This quantified non-energy benefit is likely to have a large impact on the TRC valuation of techs which displace wood-powered heating. I don't think this slide is talking about the economic selections yet, but can you help me understand how and when that TRC filter will be implemented?

PacifiCorp Response:

This impact was incorporated into the study shortly after report finalization. The Company will present the findings of this study during the next demand-side management (DSM) Advisory Group meeting. Economic potential is assessed within the Integrated Resource Plan where DSM is modeled as an additional "Supply-Side Resource" where costs and non-energy impacts have been calculated using approved cost-effectiveness tests for each state. The Company will use state-approved tests in the program-planning process.

- Slide 18: I'm still unclear on the incentive cost 75% discount. Please point me in the right direction to better understand how costs and benefits are viewed.

PacifiCorp Response:

The incentive rate methodology will be fully detailed in the Conservation Potential Assessment (CPA) final report. For additional discussion on this topic, please refer to the "Cost-effectiveness" section of the 2016 Portland General Electric Demand Response Market Research Study and the 2016 California Demand Response Cost-Effectiveness Protocols.

- Slide 21: How does PAC account for any interactive affects between class 1 and class 2 DSM? For example, if a WA DSM measure replacing resistance zonal heating with DHP is heavily selected, does that selection reduce the amount of available MWs for DLC Smart Thermostats?

PacifiCorp Response:

Interactions between Class 1 and Class 2 DSM are not accounted for in the current analysis.

- Slide 25: It seems that WY has a lot of potential for third-party contract DSM. Why is that?

PacifiCorp Response:

The substantial large/extra-large commercial and industrial loads present within the state of Wyoming are well-suited for the implementation of third-party contract demand-side management (DSM). Please refer to slide 97 of presentation from June 29, 2018 for a graphical comparison of Wyoming load to that of other states.

- Slide 28: Please provide the workpapers supporting the calculation of the $4.74/MWh stochastic risk reduction credit.

PacifiCorp Response:

PacifiCorp will send the requested work papers as a confidential data disc October 22, 2018.

- Slide 28: Another stakeholder mentioned that similar valuation studies report this value at ~15-25% of the wholesale market value, which would usually be quite a bit more than $4.74/MWh – perhaps over double. Please put PAC's valuation in context with other valuations and explain any differences. I'd strongly recommend including this context and explanation in the IRP itself.

PacifiCorp Response:

PacifiCorp will consider the request to discuss the energy efficiency credits in the 2019 Integrated Resource Plan.

- Slide 28: It's always hard to know what to do with carbon risk and pricing. If I understood correctly, this risk reduction credit included the 2017 IRP update carbon risk, which started at 2030. Is 'hardcoding' that carbon price risk into the valuation of the risk reduction a reasonable way to represent that risk, and the value of EE's hedge against that risk?

PacifiCorp Response:

The stochastic risk reduction credit is intended to reflect the value energy efficiency provides in terms of reducing portfolio risk, by comparing a portfolio with and without energy efficiency, all other assumptions being the same. Using PacifiCorp's base CO_2 assumption consistently among portfolios is reasonable in order to isolate the value of energy efficiency in terms of reducing portfolio risk.

- Slide 28: I understood that PAC applies this risk reduction credit within SO's deterministic modeling, but not PaR. I didn't understand why. Is it because PaR's purpose is to value that risk, so including it would be 'doublecounting'?

PacifiCorp Response:

Yes, your understanding is correct.

- Slide 30: This was an interesting presentation, but we were squeezed for time. T&D planning is a focus of the commission right now. I'd appreciate seeing the workpapers for this calculation and the data informing each input, just to understand what they are.

PacifiCorp Response:

Please see further discussion of Transmission and Distribution (T&D) credit calculation in the September 27-28, 2018 public input meeting materials. Requested work papers will be sent via confidential data disc no later than October 31, 2018.

- Slide 32: I was surprised to see that transmission cost forecasts went down relative to 2017, but then I don't have much of a foundation. Please provide work papers and background information supporting the changes for both distribution and transmission.

PacifiCorp Response:

Please see further discussion of Transmission and Distribution (T&D) credit calculation in the September 27-28, 2018 public input meeting materials. Requested work papers will be sent via confidential data disc no later than October 31, 2018.

- Slide 34: Is there a cost or value of decrements? It was mentioned that decrements are easier to do with curtailment, but that seems like a loss of value which would be useful to valuate. Is this correct? Is there a reason to assume that decrements are rightly valued at $0? Or am I missing something?

PacifiCorp Response:

In the Energy Imbalance Market (EIM), one way participating resources provide a benefit (specifically: earn a margin) is when prices are lower than their dispatch price (i.e. bid). When that happens, the resource can be dispatched down (generate less), allowing for imports from other resources with lower costs elsewhere in the EIM footprint. The savings are equal to the difference between the (lower) EIM price and the (higher) dispatch price, and this value is referred to as the Intra-Hour Flexible Resource Credit (IHFRC). Solar resources, and wind resources that are not receiving PTCs, both generally have a dispatch cost of approximately $0/megawatt hour (MWh). As a result, if these resources are available for dispatch by the EIM at a price of $0/MWh and prices in their area go below $0/MWh, dispatching them down would create benefits in the form of the margin between the negative EIM price, and the $0/MWh dispatch price. If, as an alternative example, those resources were generating Renewable Energy Credits (RECs) with a value of $5/MWh, curtailing them to take in incremental EIM imports would result in the loss of a REC, and they would only be economic to dispatch when prices in their location were below -$5/MWh, reducing their expected benefits from curtailment. The Company is not assuming that the value of RECs is $0/MWh, but is using that value to inform the IHFRC in the absence of a clear alternative.

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- Slide 37: Is there a reason why 2017 is the historical test year chosen for this study? I'm not sure how to pull in more years of actuals would add much to the study, but it seems like more than one year would be better than one year. Is this feasible? Will this be feasible in the future as EIM data builds over time?

PacifiCorp Response:

At present, 2017 is the only year for which relatively complete data from solar resources is available, as the solar resources in the Company's portfolio primarily came online during 2016. Furthermore, the Company's portfolio is expected to continue to change over the next several years with wind repowering, new wind, new transmission and solar resource additions, so direct comparisons from year to year will continue to be difficult. Any forecasting improvements that the Company's forecast vendors are able to achieve through additional experience would also be best incorporated through the most recent data.

In addition, the flexible reserve study is primarily measuring the uncertainty in the Company's portfolio, and is not a raw measure of the historical requirements. For instance, because requirements are generally higher when wind generation is higher, higher wind generation in the historical period could result in higher requirements. By measuring the uncertainty and applying the associated requirements to the Company's normalized forecast of wind and solar generation, higher wind generation in the historical period won't necessarily impact the forecasted results. Instead it will result in a slightly larger sample of high wind generation conditions, and a slightly smaller sample of low wind generation conditions. Given that, the benefits of building a bigger sample by incorporating more years of data are expected to be outweighed by the benefits of focusing on the most up-to-date information.

- Slide 45: What happened in winter with the 5 and 6% errors?

PacifiCorp Response:

The California Independent System Operator (CAISO) creates these forecasts for the Energy Imbalance Market (EIM). PacifiCorp has no privileged information on the CAISO's load forecasting model or load forecasting techniques. Those outliers occurred during hour ending six and hour ending seven on January 1, 2017 in the PacifiCorp East Balancing Area.

- Slide 47: This slide does a great job boiling down the study's results into something understandable. Very good job with this!
- Slide 49: I apologize for asking again, but please explain why EIM's positive impact on PAC's power costs is best represented as a credit to flexible capacity.

PacifiCorp Response:

Dispatchable resources that participate in the Energy Imbalance Market (EIM) are compensated for the changes in output that they are directed to make. Those within-hour changes in output in EIM are not contemplated in the models used in the Integrated Resource Plan, which don't include within-hour granularity or the loads and resources of other EIM participants. The intra-hour flexible resource credit is intended to reflect an expected benefit of dispatchable resources that would otherwise be ignored.

- Slide 51: Why did PAC establish the TRC? Was that developed because of an order or acknowledgement letter?

PacifiCorp Response:

The Company first used a Technical Review Committee (TRC) during its 2012 Wind Integration study, prepared for the 2013 Integrated Resource Plan. During the 2010 Wind Integration Study, stakeholder feedback identified assumptions and methodology considerations which were difficult to address in a public input meeting forum. During the 2012 Wind Integration Study, the TRC was engaged to provide more timely and expert feedback regarding the Company's study.

- Slide 53: Not sure if this is the forum to review the decision to let PAC's COB transmission reservation lapse, but it seems pertinent. What went into that decision? Were the factors informing that decision a reason to also derate or otherwise modify FOT assumptions?

PacifiCorp Response:

The COB derate is the reason the 2019 Integrated Resource Plan (IRP) Front Office Transaction (FOT) planning limit decreased from 1,575 megawatt hour (MwH) in 2017 IRP to 1,425 MwH in the 2019 IRP, reflecting expired reservation and review of historical derates.

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- Slide 54: Does the WECC study's include DSM?

PacifiCorp Response:

The Western Electricity Coordinating Council (WECC) Power Supply Assessment (PSA) excludes demand-side management (DSM).

- Slide 54: What does the last bullet mean? What are PSE values and why were they lowered for 2017?

PacifiCorp Response:

The Western Electricity Coordinating Council (WECC) megawatt data includes only existing resources, net transfers and resources under construction. It does not include planned resources. The WECC Power Supply Assessment (PSA) is expected to be published December 2018, however WECC provided guidance that margin values are expected to be about 5% lower than the prior PSA.

- Slide 59: This slide is interesting but confusing. Is it fair to say that the gray and white parts of these graphs are not inclusive of outages, but that the reserve represented by the blue triangle contemplates that risk?

PacifiCorp Response:

This chart represented a high level of PacifiCorp's annual position during heavy load hours with existing and planned resources. The blue triangle (Load-Sales-Reserves) could be met the by market purchases, increased dispatch, reduction in sales or a combination of actions. This model makes the decision on the basis of economics and prevailing transmission constraints in a given hour.

- Slide 61: This is the best slide I've seen in understanding how and when PAC actually relies on the market. Great job to the team for walking through the annual, monthly and daily curves.

- Slide 61: I'm still a bit confused about how PaR understands capacity. SO adds capacity as needed based on its parameters and its optimization. What does PaR see? Is a schedule of new resources an input to PaR?

PacifiCorp Response:

The System Optimizer (SO) portfolio is an input to Planning and Risk model (PaR). The portfolio of expansion resources selected by SO meets load and resource needs inclusive of a Planning Reserve Margin. PaR does not select resources.

- Slide 62: Someone had a good idea of presenting this table looking at a shorter view, say, 2014-2017, to see if the market availability is tightening over time. Perhaps the data could be presented on a yearly basis to show the variation in depth and PAC's activity.

PacifiCorp Response:

This table is based on a historical market purchases from 2009-2017. Given the short view from 2014-2017, the company will not see the market availability tighten during this time frame. In reviewing historical data, the market availability does not reflect tightening even in the shorter view. The summer and winter percentages were roughly the same compared to the longer term 2009-2017.

- Slide 67: I'm confused about why 2017's PRM was allowed to buy FOTs up to transmission limits instead of up to the FOT depth assumption limits. Please explain that decision, as well as the decision to change that for this IRP.

PacifiCorp Response:

To better understand the issue, front office transactions (FOTs) are proxy resources used in the Integrated Resource Plan (IRP) portfolio development process that represent firm forward short-term market purchases for summer and winter on-peak delivery, which coincides with the time of year and time of day of the Company's coincident system peak load. In the Planning and Risk (PaR) model, system balancing purchases are considered non-firm and short term purchases. This same treatment is applied to the System Optimizer (SO) model. Only FOT's are recognized for planning purposes in meeting the planning reserve margin (PRM). System balancing purchases do not count towards meeting the planning requirements, but are available to the extent there are market opportunities available on a non-firm basis.

The contribution of firm market purchases are removed from the SO plan and are not transferred to PaR in the reliability studies. To align the modeling to the planned firm purchases limits set by FOTs, the system balancing purchases were restricted to amount and locations of the FOTs as part of the planning reserve margin studies but were available in all months. This limits the system balancing market purchases to the firm market purchases as set by the FOTs. This is a better representation of what can be counted on as a firm product to meet reliability, and removes any concern of relying on non-firm market purchases to meet reliability. This is an improvement to the IRP modeling process.

- Slide 68: I'm embarrassed to say I'm still confused by the difference between capacity factor and capacity contribution. I think the terminology is used somewhat interchangeably.

PacifiCorp Response:

Capacity factor is a resource's expected (or actual) generation over the course of a year, divided the amount of energy that resource could have produced if operating at its full nameplate capacity in all hours of the year. Capacity factor is generally a measure of energy output. Capacity contribution is a resource's expected ability to deliver output at times when loss-of-load events are most likely to occur. It is calculated by dividing the output during these periods by its nameplate capacity. Capacity contribution is generally a measure of capacity that can be counted on for planning purposes.

One source of confusion is the fact that the capacity contribution values in the Integrated Resource Plan are largely derived from what has been called the "capacity factor approximation method". This methodology compares a resource's expected generation profile to hours where the Company is at most risk of loss-of-load events. If a 50% capacity factor resource is expected to generate at its nameplate in all of the hours with loss-of-load events, it would have a 100% capacity contribution. If, on the other hand, that 50% capacity factor resource was expected to have zero generation in all of the hours with loss-of-load events, it would have a 0% capacity contribution.

- Slide 74: Again, remedial question – What is the high-risk cost PVRR based on? PaR does 50 runs, and the outputs include both fixed and variable costs. I have in my notes that the high-risk PVRR is 5% of system variable costs at the 95th percentile. Does that mean the adder is 5% of the variable costs in the roughly-third most expensive of the 50 runs?

PacifiCorp Response:

Please refer to Chapter 7 Modeling & Portfolio Evaluation Approach pages 166-169 of the 2017 Integrated Resource Plan for a detailed description of Monte Carlo simulation and stochastic portfolio performance measures.

- Slide 75: I realize that the results of the wood smoke study's PM2.5 health benefits valuation shouldn't directly apply to coal emissions, but I wonder if there's some conservative proxy value might be appropriate to include in the endogenous retirement study. Is this possible? What does an endogenous retirement case use to make optimized decisions?

PacifiCorp Response:

Please see further discussion of its approach to coal studies in the September 2018 public input meeting materials. PacifiCorp will conduct its coal studies under a range of price-policy scenarios.

- Slide 76: What is the incremental L&R? Incremental to what? Net load growth?

PacifiCorp Response:

These core case examples were illustrative only, and discussed in the 2017 Integrated Resource Plan public input meeting process.

- Slide 77: Do core cases have CO2 prices? Or is that topic explored solely in sensitivities?

PacifiCorp Response:

Please see further discussion of portfolio development in the September 2018 public input meeting materials. All portfolios will be modeled under different price-policy scenarios, including a base CO_2 assumption.

- Slide 77: I would appreciate a deeper dive on the UT requirement for an acquisition pathway analysis.

PacifiCorp Response:

Please see reference and discussion of Integrated Resource Plan (IRP) Acquisition Path Analysis in Chapter 9 - Action Plan and Resource Procurement of the 2017 IRP.

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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.
Click here to enter text.

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

Thank you for participating.

* Required fields