PacifiCorp - Stakeholder Feedback Form

2015 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 2015 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 8/20/2014

*Name: Fred Heutte Title: Click here to enter text.

*E-mail: fred@nwenergy.org Phone: 503.757-6222

*Organization: NW Energy Coalition on behalf of PacifiCorp IRP "Clean Energy Scenario Stakeholders"

Address: Click here to enter text.

City: Click here to enter text. State: Click here to enter text. Zip: Click here to enter text.

Public Meeting Date comments address: **8/8/2014** ☐ 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.
Scenario Matrix for 2015 IRP

☐ 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.
The Clean Energy Scenarios Stakeholders – HEAL Utah, Idaho Conservation League, Mormon Environmental Stewardship Alliance, NW Energy Coalition, Powder River Basin Resource Council, Renewable Northwest and Sierra Club -- would like to submit the following:

1. We would like to provide some initial feedback regarding the Company's proposed methodology for including EPA's 111(d) regulations in this IRP cycle. We agree with the Company's approach to incorporate proposed 111(d) regulations as comprehensively as possible. Further, we appreciate the Company's willingness, based on stakeholder feedback, to run a multistate mass-based 111(d) scenario that optimizes for the PacifiCorp system. Regarding the specific proposed 111(d) modeling approach, we have two general comments that we would like to explore with the Company as potential areas of improvement for this analysis.

   (a) We are concerned that the ordering of the building blocks in the Company's scenario maker modeling framework could impact results in a manner that excludes some compliance scenarios that may be least cost/least risk. Because the framework is not an optimizing modeling approach, each building block should be incorporated into the analysis in a manner that will be able to adequately evaluate its potential contributions. We ask the Company to consider running one or more scenarios that change the order of the 111(d) scenario maker modeling framework by reordering the spreadsheet modeling dispatch to: (1) renewables; (2) other; (3) new NGCC; and (4) existing NGCC.

   (b) We have raised concerns during the IRP workshops about the inadequate inclusion of energy efficiency in the 111(d) analysis. We understand the data constraints inherent in a more comprehensive approach at this time. However, we maintain that there should be some approach that offers enhanced representation of energy efficiency resources in the 111(d) modeling for this IRP. One proposal is for the Company to include a scenario that assumes that every state can reach the 1.5% load achievement used by the EPA in the target setting. We are open to other proposals for how to better incorporate energy efficiency resources in the 111(d) modeling, and welcome continued dialogue on this point.

* Required fields

2. CO2 Price analysis (Base Case C13, Sensitivity Case S11)

   We appreciate the discussion so far about the general approach to incorporating carbon price in the IRP assessment process. Our view is that the proposed EPA 111(d) regulation takes an important first step toward regulating greenhouse gas emissions, and now becomes the base case going forward. While the rule itself is still in draft form and will be finalized after the completion of the 2015 IRP, we believe the Company is making progress in modeling the draft rule. That effort will also make further refinement easier in future IRPs as the rule is finalized and state implementation plans are formed.

   However, the 111(d) rule as now proposed only runs until 2030, short of this IRP's time horizon through 2034, and also is not likely to fully achieve the emissions reductions contemplated by the current Oregon and Washington state greenhouse gas goals, or possible adjustments in the future as state and federal governments assess how to respond to the new findings of climate science.

   Therefore it is appropriate to model additional greenhouse gas reduction requirements that could be implemented with future public policy. Potential policy options include but are not limited to enhancements to the 111(d) targets, and state or federal adoption of carbon price programs (carbon tax/fee or cap-and-trade). Within the modeling context this is most easily represented as a proxy "carbon tax," but we prefer to use the term "CO2 price" as having the most inclusive meaning.

   We are also mindful of the requirements set forth in the Oregon PUC's revised IRP Guideline 8 (Order 08-339) to construct a base-case scenario to reflect the most likely future compliance path for CO2, and to develop compliance scenarios ranging from present levels to the "upper reaches of credible proposals by government entities."

   In light of the preceding and to keep our recommendation as simple as is reasonable, we propose that the Company conduct two scenario analyses based on regionally accepted carbon price analysis, with carbon prices in 2034 of $52 and $111 per short ton of CO2 (in 2014$) as described below.

   In each case we propose that the carbon price begin in 2020 (reflecting a reasonable early start date for potential state or federal carbon price programs), with a linear increase -- for simplicity -- toward the respective 2034 carbon prices. We propose $20/short ton as the starting price, in line with the California Energy Commission's estimates of the California AB 32 cap-and-trade program's carbon market level in 2020 of $16.30 (low case) and $24.44 (medium case). Table 1 in the attached worksheet includes linear interpolation for each year between 2020 and 2034. We have extended the interpolation until 2050 so that the CO2 emissions of any plant continuing to operate after 2034 can be assessed in the modeling.

   Finally, we believe it is important to have both CO2 Price scenarios run with PaR analysis, while anticipating that further discussion will be needed about how PaR is being run for this IRP cycle.

   Our proposals for CO2 Price scenario cases are:

   (a) A full "CO2 Price" case with a 2034 value of $52/short ton CO2, starting from an initial level of $20 in 2020 (we suggest using Core Case Matrix case C13). The recommended value of $52 has recently been adopted by the Transmision Expansion Policy Planning Committee (TEPPC) of the Western Electricity Coordinating Council for the 2015 WECC transmission plan as the value for the 2034 reference case. The WECC analysis (attached) combines all available public inputs, including utility IRPs,the Northwest Power and Conservation Council, LBNL, the draft federal guidance on social cost of carbon, EIA and Synapse to arrive at this result. We propose that this case be run in conjunction with the full 111(d) analysis to capture the interactive effects of both.

   (b) A "High CO2 Price" sensitivity case using a 2034 value of $111/short ton CO2, starting from an initial value of $20 in 2020 (we suggest using Scenario Case S11). This value is used by CEC in their high case for California AB 32 cap-and-trade in 2034. Other approaches are possible but we believe the CEC analysis is thorough and observe that the California carbon pricing program will have significant influence on the rest of the western region. Consideration of a high value is appropriate in a context where policy makers focus on the tail risk of climate change and decide to take an "insurance" approach to potential climate impacts.

3. Solar PV Breakthrough (Scenario Case S12a and S12b)

   To contribute to a solar PV trigger point analysis, we propose two Scenario Case runs using projected costs in 2034, with interpolation for annual values to be developed in further discussions with the Company.

   In contrast to the bottom-up analysis prepared by Navigant, which pays close attention to near-term cost factors, our approach is based on a simplified experience curve analysis to provide a rangefinding exercise for a breakthrough case for solar PV market penetration over the next 20 years.

* Required fields

Experience curve analysis is robust and has been thoroughly tested across many industries and product categories. It is particularly well characterized for solar PV, from the first assessments in the late 1970s to the present. We apply the broadly accepted distinction of a learning rate of 80% for solar PV modules and 85% for "soft costs" – balance of system equipment, materials, installation, marketing, overhead, etc. That is, for every aggregate doubling in global installed capacity, module costs on average decline by 20% and soft costs by 15%.

While experience curve analysis is robust on the decadal scale, it has limited forecast skill for shorter periods. Market, policy and investment factors may shift costs in one direction or another for short periods from the long term trend. But for analysis periods of a decade or longer, experience curve analysis is very suitable for contexts such as integrated resource planning.

In an experience curve analysis, the decline in costs per market doubling is fixed, but the duration for each doubling can change. Over the next 20 years, the solar PV market is expected to expand dramatically. Starting from the current small base, overall market penetration (in GWh) could range from, say, 5% to 20%. The doubling rate itself can vary within the 20-year period, but the relevant point is how many doublings occur during that time span.

We pick two doubling rates for analysis. One is for 5 doublings between now and 2034 (i.e., an average of every 4 years), and one for 6 doublings (an average of about 3.3 years). For comparison, doubling periods for global aggregate PV capacity have actually been less than 3 years over the last few years.

If solar PV energy production is 0.25% of the total today, our analysis assumes a total market production in 2034 of 8% (for 5 doublings) or 16% (for 6 doublings) – in practice the actual percentages may vary slightly because of load growth, which we are setting aside here for simplicity. The high number is within the range of NREL's Western Wind and Solar Integration Study (phase 2), which modeled several 33% renewable scenarios for the western interconnection including a High Mix 16.5% wind/16.5% solar case.

We also recommend using the WECC 2015 transmission plan capital costs for current solar PV. These are almost identical to the Navigant report for residential and commercial rooftop, but add small and large generation projects with both fixed tilt and variable axis. We will work with the Company to determine the best configurations to use in the modeling. We also adopt the WECC values for dc-to-ac conversion factors (1.2 for rooftop, 1.3 for large scale variable and 1.4 for large scale fixed, reflecting trends in inverter loading ratios).

We realize there are many other factors affecting a solar PV breakthrough analysis. For example, the times at which solar PV becomes fully market driven may be significantly different, relative to retail rates for residential and commercial end users, or to avoided costs for the Company, which would change the market dynamics for different configurations. And it does not include consideration of related technology co-evolution, such as smart grid and storage. But we believe the simplified analysis here could provide useful insight into the long term potential for solar PV.

The attached spreadsheet provides the basic analysis details. Again, we will work with the Company to provide annual interpolations for these cost trajectories. Our scenario proposals are:

(a) "Medium Solar PV Breakthrough" analysis (proposed Scenario Case S12a). See Table 2, line 47 of the attached spreadsheet. For example, current residential rooftop costs (kW/dc) are $4,809, declining to $1,855 in 2034.

(b) "High Solar PV Breakthrough" analysis (proposed Scenario Case S12b). See Table 2, line 48 of the spreadsheet. Residential rooftop costs would be $1,537 in 2034.

4. Clean Energy Scenario (Scenario Case S14)

Finally, we propose a new case, which could be designated Scenario Case S14, to combine the interactive effects of the CO2 Price (Base Case C13) and the Medium Solar PV Breakthrough (Scenario Case S12a).

We would also like to request a PaR analysis for this scenario case.

Submitted by:
Christopher Thomas, HEAL Utah
Ben Otto, Idaho Conservation League
Ty Markham, Mormon Environmental Stewardship Alliance
Fred Heutte, NW Energy Coalition
Shannon Anderson, Powder River Basin Resource Council

* Required fields

Michael O'Brien, Renewable Northwest
Amy Hojnowski, Sierra Club

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.

2015-clean-energy-stakeholders-scenario.xls
Technical Support Document: -Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis -Under Executive Order 12866 -Interagency Working Group on Social Cost of Carbon, United States Government, November 2013
WECC Carbon Price Forecast Discussion, August 7, 2014
WECC Final Recommended Scenario Modeling Parameters, 2014-08-LTPT_Model_Params_20140709_v2.xls
2012-09-03-nwec-experience-curves-and-solar-pv.pdf

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

Click here to enter text.

Thank you for participating.

* Required fields