

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 8/7/2014

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City: Portland

State: OR

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Public Meeting Date comments address: 8/7/2014

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.

Solar PV resource costs

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.

E3 made an in-depth presentation on solar PV inverter loading ratios and the effect on estimating dc>ac conversion ratios in a webinar last winter. See slides 26-34. E3 and B&V recommended adopting conversion ratios of 1.40 for fixed tilt (utility scale), 1.30 for tracking (utility scale) and 1.20 (rooftop). In further correspondence with Keegan Moyer at WECC, I passed along additional recent assessments showing some changes in rooftop as well, leading toward inverter oversizing to capture southwest/west incident energy. In addition, there is growing interest in the role "smart inverters" can play in providing distribution level ancillary services (frequency, voltage and vars). The Clean Coalition has interesting views on this as part of the California PUC Electric Tariff Rule 21 review process, see attached article by Stephanie Wang and draft report from the Smart Inverter Working Group. This is hardly a new idea, as the attached article from Kueck et al. shows (Electricity Journal 2006).

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.

E3, "Wind & Solar Performance Review, December 12, 2013

http://www.wecc.biz/Lists/Calendar/Attachments/5805/131212_E3_BV_PerformanceReview.pdf

Recommendations for Updating the Technical Requirements for Inverters in Distributed Energy Resources, Smart Inverter Working Group Recommendations, California PUC, January 2014

Stephanie Wang, Energy Collective, "Who Should Bear the Costs of Advanced Inverters?", 2013.

<http://theenergycollective.com/stephaniewang/286511/who-should-bear-costs-advanced-inverters#comment-91811>

Kueck et al., "Reactive Power from Distributed Energy," Electricity Journal, 2006.

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

1. Adopt WECC recommendations -- conversion ratios of 1.40 for fixed tilt (utility scale), 1.30 for tracking (utility scale) and 1.20 (rooftop).
2. Continue to assess dc>ac conversion factors in key market segments going forward.

* Required fields

3. Consider potential for advanced inverters and other load-side devices to provide ancillary services and decrease the need for conventional resources to provide same.

Thank you for participating.