

# 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 9/14/2016

\*Name: Gloria Smith Title: Managing Attorney

\*E-mail: gloria.smith@sierraclub.org Phone: 415-977-5532

\*Organization: Sierra Club

Address: 2101 Webster Street, Suite 1300

City: Oakland State: CA Zip: 94612

Public Meeting Date comments address: 8/25/2016  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.  
Modeling of battery energy storage systems

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.

In the August 25th Public Input Meeting, the Company indicated that it was unsure how to incorporate battery energy storage into its modeling framework. We request that the Company model battery energy storage systems (BESS) as receiving a certain amount of revenue to represent the value of storage to PacifiCorp's system. The value of storage should be considered as a combination of sub-hourly use cases, which may include but are not limited to frequency regulation, voltage support, and congestion relief.

The value of storage can potentially be incorporated into modeling as a negative (i.e., revenue rather than cost) fixed per-kW operations and maintenance cost or similar mechanism. Note that this value should not be phrased as a negative dispatch-adder despite the fact that some benefits accrue on a per-energy basis because these benefits often occur on a sub-hourly basis. As such, the Company should develop a reasonable assumption as to the yearly total benefit provided by BESS in, for example, frequency regulation and then normalize this value to the assumed BESS capacity.

When comparing portfolios with BESS to those without, PVRR(d) values should be adjusted to account for the value of transmission and distribution system upgrade deferrals that are enabled by BESS, as appropriate to PacifiCorp's system. If PacifiCorp has identified any particular deferral opportunities, those should be clearly identified and studied as sensitivity cases if possible. If not, an upgrade-deferral investigation should be included in the Company's next transmission planning study.

To the extent that PacifiCorp is able to develop-system specific values for these benefits, we support this effort and look forward to the presentation of such values at a future Public Input Meeting. However, in the knowledge that this task may be unfeasible in the time available, we recommend that:

\* Required fields

1) PacifiCorp reference a well-vetted literature report such as NREL's 2013 report on the value of storage for grid applications (<http://www.nrel.gov/docs/fy13osti/58465.pdf>) for the purposes of this IRP

2) For the IRP Update and future IRPs, PacifiCorp should conduct a Value of Storage study to determine system-specific valuation parameters

Finally, given the rapidly-developing state of the battery market, we recommend that PacifiCorp model BESS with a negative capital escalation rate, commensurate with those found by DNV-GL in its support study for the IRP (discussed on slides 93 and 94 of the August Public Input Meeting slide deck).

---

**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.