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	5/20/2019
*Name:	Hunter Holman	Title:	Click here to enter text.
*E-mail:	hunter@utahcleanenergy.org	Phone:	Click here to enter text.
*Organization:	UCE		
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: Click here to enter date.   ☐ 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.
Renewable Energy Resources

☐   Check here if any of the following information being submitted is copyrighted or confidential.

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

---

*Respondent Comment: Please provide your feedback for each IRP topic listed above.
In December 2018, Utah Clean Energy provided comments in a stakeholder feedback form citing three recent studies that demonstrate the ability of renewable energy resources to provide grid services such as spinning reserve, load following, voltage support, ramping, frequency response, variability smoothing, frequency regulation, and power quality improvement. For convenience, we are providing citations to these resources again below.

During the April 25 stakeholder meeting, PacifiCorp stated that it is now dispatching a portion of its renewable energy fleet as dispatchable, flexible resources. However, based on information contained in the April 25 presentation, it does not appear that PacifiCorp is modeling renewable resources as truly dispatchable, flexible resources capable of providing regulation services, voltage support, spinning reserves, and other essential advanced grid management tools. On slide 36 of the April presentation, PacifiCorp says that the deterministic studies contain an assumption that variable energy resource generation profiles will be fixed. On slide 37 of the April presentation, PacifiCorp reiterates that renewable energy resources are modeled with fixed hourly generation profiles, "and always produce as scheduled in the model." This seems to indicate that PacifiCorp's modeling does not allow renewable generation to operate and be dispatched flexibly, which undercuts the value of PacifiCorp's renewable generation fleet by preventing the model from calling on these resources to provide valuable grid services.

Please describe the changes PacifiCorp made to the dispatch and treatment of its renewable energy generating resources to dispatch this fleet, or a portion of it, more flexibly. In your answer to this question, please explain which of
* Required fields

the grid services listed above and discussed in the studies cited below PacifiCorp's renewable resources are allowed to provide in PacifiCorp's IRP.

PacifiCorp Response:

Proxy wind and solar resources available for selection within the Integrated Resource Plan (IRP) models are dispatchable down from their hourly generation potential (i.e. capacity factor output). Existing wind and solar contracts and assets owned by PacifiCorp are also dispatchable down consistent with contractual rights and control equipment.

To clarify slide 37 from the April 25, 2019 public input meeting presentation, these wind and solar resources are modeled with fixed hourly generation potential but subject to being dispatched down—in this way, the fixed hourly generation profile effectively represents a maximum availability. While these hourly profiles contain a range of conditions across a month, the hourly profiles for a given day and hour are fixed, so these renewable resources always contribute the same amount in the peak hour. In reality, there is significantly more uncertainty and variability in renewable resource output.

These wind and solar resources are allowed to provide regulation reserve up to 50% of the nameplate capacity, subject to their modeled hourly generation potential, however, resources located in the Wyoming Northeast transmission area are not allowed to provide regulation reserve due to transmission constraints, though they can still be dispatched down. The 50% reserve limit is intended to reasonably address uncertainty in forecasted and instantaneous generation potential and the reliability of additional output from these resources.

With regard to specific grid services relative to the IRP modeling:

- Load following/ramping/frequency regulation – all of these services are bundled in a single requirement within the IRP model which contains hourly granularity. To address sub-hourly variations, the IRP model contains a "regulation reserve" requirement that captures the variability and uncertainty between hour-ahead hourly forecasts and intra-hour actual load and resources. This represents the largest portion of the modeled reserve requirements in the IRP.

- Frequency response: This requirement is not natively addressed within the IRP model. PacifiCorp is reviewing the modeled results to assess whether the frequency response capability of the existing portfolios is sufficient to meet the frequency response compliance obligation. PacifiCorp is including the frequency response capability of wind and solar resources in this assessment.

- Spinning reserve/Non-spinning reserve: These are modeled however, wind and solar resources do not provide these services due to concerns about North American Electric Reliability Corporation (NERC) compliance obligations and the ability to reliably maintain required output levels. As discussed above, wind and solar resources provide regulation reserves.

- Voltage support/variability smoothing/power quality improvement - These requirements are not natively addressed within the IRP model. These services generally relate to local transmission conditions, while the IRP model assesses general requirements over broad transmission areas. When specific projects are being evaluated, the specific location and equipment are taken into account in the transmission assessment.

Investigating the Economic Value of Flexible Solar Plant Operation: https://www.ethree.com/wp-content/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf

Demonstration of Essential Reliability Services by a 300-MW Solar Photovoltaic Power Plant: https://www.nrel.gov/docs/fy17osti/67799.pdf

Advanced Grid-Friendly Controls Demonstration Project for Utility-Scale PV Power Plants: https://www.nrel.gov/docs/fy16osti/65368.pdf

* Required fields

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.

Please submit your completed Stakeholder Feedback Form via email to IRP@Pacificorp.com

Thank you for participating.

* Required fields