PacifiCorp - Stakeholder Feedback Form

2023 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 2021 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: 8/17/2022

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*Organization: Utah Division of Public Utilities

Address: 160 E. 300 South, Heber M. Wells Bldg, 4th floor
City: SLC State: UT Zip: 84111
Public Meeting Date comments address: 6/1/22, 7/14/2022 ☐ Check here if not related to specific meeting
List additional organization attendees at cited meeting:

*__IRP Topic(s) and/or Agenda Items:__ List the specific topics that are being addressed in your comments.
Replacing 1 in 20-year weather pattern in IRP load forecast with climate change temperatures from 2021 Reclamation Study for 2023 IRP load forecast.

☐ 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.

Please see attached DPU Stakeholder Comments on PacifiCorp's 2023 IRP.

* Required fields

At the June 10, 2022, and July 14, 2022, Public Input Meetings (PIM), PacifiCorp (Company) stated that it is considering adopting climate change temperatures within the baseload forecast for the 2023 IRP. The climate change scenario relies on median projected temperature projections from the U.S. Bureau of Reclamation (Reclamation) West-Wide Climate Risk Assessments: Hydroclimate Projections Study (March 2021). As presented at the July 14, 2022, PIM (slide #7), the Reclamation study uses Green River, Utah as the location to determine projected temperature change. The table on slide #7 indicates that this is the same location used for Wyoming.

The Division notes that most of the population in Utah is located along the Wasatch Front, and the projected temperature changes for Green River may not reflect the optimal location for projected temperature changes in Utah. It was noted at the July 14, 2022, meeting that the Reclamation Study originated from the Rocky Mountain North Jobs Corps Study, which was a hydrology study specific to the northwestern U.S. states, and the weather "stations" or centers may have been chosen for hydrological reasons. The Reclamation Study may not represent the most accurate climate change scenario in developing the IRP load forecast for Utah. The Company stated that it conducted a thorough literature review before making the decision to rely on the Reclamation study for use in the climate change scenario for the 2023 load forecast.

1. Please provide links or source documents that the Company considered in its review and explain why each of the respective studies was eventually not selected. What was the second-best weather pattern literature that the Company considered for the 2023 IRP load forecast?

2. The Company stated that incorporating median climate projections from the Reclamation Study results in a roughly 2% increase in system peaks and a 0.1% decrease in energy in 2032. Please provide the breakdown in system peaks and energy by PAC-East and PAC-West regions in 2032. The Division notes that it requested this information at the July 14, 2022, PIM.

3. Please justify not including the Wasatch Front as a location for the climate change scenario in the load forecast for Utah. Is the Company confident that the temperature changes projected for Green River are representative of the temperature changes projected for the Wasatch Front? Please explain and provide source documentation.

4. Please provide the 2023 IRP 1-in-20-year weather pattern load forecast compared to the 2023 IRP Climate Change forecast. Please provide this comparison by PAC-East and PAC-West regions, as well as on a system basis for the front ten years of the planning horizon.

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.

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

Thank you for participating.

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* Required fields

PacifiCorp Response (9/8/22)

1. **Please provide links or source documents that the Company considered in its review and explain why each of the respective studies was eventually not selected. What was the second-best weather pattern literature that the Company considered for the 2023 IRP load forecast?**

River Management Joint Operating Committee: Bonneville Power Administration, United States Army corps of Engineers, United States Bureau of Reclamation, June 2018, Climate and Hydrology Data sets for RMJOC Long-Term Planning Studies: Second Edition, Part I: Hydroclimate Projections and Analysis. rmjoc-ll-report-part-l.pdf (bpa.gov)

The study focused on the Columbia River Basin, which provides relevant temperature and hydrological projections for some states within PacifiCorp's service territory. However, given the absence of temperature and hydrological projections for all PacifiCorp jurisdictions, this study was ultimately not selected for informing Draft 2023 IRP climate change projections.

United States Department of the Interior, Bureau of Reclamation, March 2016, Managing Water in the West, Technical Memorandum No. 86-68210-2016-01, West-Wide Climate Risk Assessments: Hydroclimate Projections. *https://www.usbr.gov/climate/secure/docs/2016secure/wwcra-hydroclimateprojections.pdf*

The 2016 Reclamation Study was relied on for 2021 IRP Climate Change Sensitivity. The Study provides both temperature and hydrological projections for locations throughout PacifiCorp's service territory. The Bureau of Reclamation updated this study in 2021. Therefore, the more recent 2021 Reclamation Study was used to inform the Draft 2023 IRP.

Impacts of Climate Change on the Electric Power Supply in the Western United States; M. Bartos and M. Chester, Arizona State University, Tempe AZ, 2015, *Nature Climate Change*, Published Online May, 18, 2015, DOI:10.1038/NCLIMATE2648. https://www.researchgate.net/publication/277880606_Impacts_of_climate_change_on_electric_power_supply_in_the_Western_United_States

This study did not readily provide information on temperature and hydrological impacts of climate change at locations throughout PacifiCorp's service territory. Further, PacifiCorp was able to find a more recent study with the required geographical granularity from the 2021 Reclamation Study.

Unprecedented 21st Century Drought Risk in the American Southwest and Central Plains; B. Cook, et al. Sci. Adv. February 12, 2015 DOI:10.1126/sciadv.1400082. https://www.science.org/doi/10.1126/sciadv.1400082

This study did not readily provide information on temperature and hydrological impacts of climate change at locations throughout PacifiCorp's service territory. Further, PacifiCorp was able to find a more recent study with the required geographical granularity from the 2021 Reclamation Study.

Climate Change is Projected to have severe Impacts on the Frequency and Intensity of Peak Electricity Demand Across the United States; M. Auffhammer, et al, Edited by K. Smith, Arizona State University, Tempe AZ, December 2016. *PNAS* February 21, 2017, Vol. 114, No. 8. https://www.pnas.org/doi/10.1073/pnas.1613193114

This study did not readily provide information on temperature and hydrological impacts of climate change at locations throughout PacifiCorp's service territory. Further, PacifiCorp was able to find a more recent study with

the required geographical granularity from the 2021 Reclamation Study.

The Company would consider the 2016 Reclamation Study to be the second-best weather pattern literature considered for the 2023 IRP load forecast.

2. **The Company stated that incorporating median climate projections from the Reclamation Study results in a roughly 2% increase in system peaks and a 0.1% decrease in energy in 2032. Please provide the breakdown in system peaks and energy by PAC-East and PAC-West regions in 2032. The Division notes that it requested this information at the July 14, 2022, PIM.**

Please refer to the table below for the requested information.

Table 1: Draft 2023 IRP Median Climate Change, Draft 20-year Normal, 2021 IRP System Peak and Energy

SUMMER Coincident Peaks (Draft 2023 IRP Climate Change)(MW)				Annual Energy (Draft 2023 IRP Climate Change)(MWh)			
Year	WEST	EAST	TOTAL	Year	WEST	EAST	TOTAL
2032	4,828	8,476	13,304	2032	31,235,277	48,752,175	79,987,452
SUMMER Coincident Peaks (Draft 2023 IRP 20yr Norm)(MW)				Annual Energy (Draft 2023 IRP 20yr Norm)(MWh)			
Year	WEST	EAST	TOTAL	Year	WEST	EAST	TOTAL
2032	4,749	8,361	13,110	2032	31,486,879	48,548,636	80,035,515
SUMMER Coincident Peaks (2021 IRP)(MW)				Annual Energy (2021 IRP)(MWh)			
Year	WEST	EAST	TOTAL	Year	WEST	EAST	TOTAL
2032	3,549	7,852	11,402	2032	23,628,940	45,878,270	69,507,210

3. **Please justify not including the Wasatch Front as a location for the climate change scenario in the load forecast for Utah. Is the Company confident that the temperature changes projected for Green River are representative of the temperature changes projected for the Wasatch Front? Please explain and provide source documentation**.

The Bureau of Reclamation study focused on major Reclamation River basins. It did not provide temperature projections for rivers within the Great Basin watershed, which includes the Wasatch front. Therefore, the Green River near Greendale, Utah provided the most representative expectation of climate change for Utah.

Based on data from climatetoolbox.org, specifically the future time series tool, the Company calculated the difference in increase in temperature over the 1990 average temperature for both Salt Lake City and the Green River near Greendale. Based on this data, the projected increase in temperature is similar for the two locations (see Table 2).

Table 2: Difference in Mean Temperature Increase over 1990 average for Green River near Greendale UT versus Salt Lake City (degrees Fahrenheit)

	Difference	
Year	RCP 4.5	RCP 8.5
2020	-0.03	-0.04
2050	-0.08	-0.05

4. **Please provide the 2023 IRP 1-in-20-year weather pattern load forecast compared to the 2023 IRP Climate Change forecast. Please provide this comparison by PAC-East and PAC-West regions, as well as on a system basis for the front ten years of the planning horizon.**

* Required fields

The 1-in-20 weather pattern load forecast for the 2023 IRP is expected to be discussed in the October IRP PIM.

* Required fields