Bench Request 02

To PacifiCorp: On rebuttal, PacifiCorp witness Ramon J. Mitchell (RJM-13CT at 57:9-17) testifies that the Company's dispatch hierarchy in Eastern Wyoming during a period of transmission congestion reduces the output of natural gas plants, then coal plants, and lastly wind power generation. Please provide documentation that shows that PacifiCorp follows this operational sequence.

Confidential Response to Bench Request 02

Executive Summary:

PacifiCorp's dispatch order in eastern Wyoming (WY) is based on bid prices: **gas and coal are reduced first, and wind is reduced last, as shown in Confidential Figure 1** below, unless limited by operational constraints (e.g., minimum stable operating levels, ramp limits, or reserves).

Wind forecasts dependent on 48 months of already-curtailed historical generation will overstate what actually can be delivered. This happens because (1) each wind project's data is out of sync with the others and (2) transmission availability is also out of sync with those project histories. As a result, the model must allow additional curtailment, so forecasts become accurate and stay within real transmission capacity and actual deliverability.

Data Response:

Please refer to **Confidential Attachment Bench Request 02 and Confidential Figure 1** below, which show resource bid prices submitted to the Western Energy Imbalance Market (WEIM) for October 2024 through September 2025 for eastern Wyoming resources.

- Tabs in the attachment:
  - **WY Wind**: Wyoming wind resource bid prices.
  - **WY Gas**: Wyoming gas resource bid prices.
  - **WY Coal**: Wyoming coal resource bid prices.
  - **Dispatch Data**: Combines the maximum and minimum bids for each resource, per hour, for October 2024 through September 2025.
  - **Dispatch Hierarchy**: Graphs the "Dispatch Data" to show the dispatch order

As shown, **wind bids are lower than gas and coal**, which tells the WEIM that **wind must be the last resource to reduce output (**curtail**)** within the transmission-constrained region—subject to operational constraints on coal and gas like minimum stable operating levels, ramp rates, and reserve requirements (capacity held back for wind forecast uncertainty). *(Note: in a correctly*

configured model, reserve holdings are ***never used, reduced, or drawn down, in any form*** *because the Aurora modeled system* ***has no uncertainty*** *(i.e., has perfect foresight)).* These "Dispatch Hierarchy" data reflect real-world operations under transmission congestion and other operational constraints, and the reality that actual wind output depends on actual wind speeds.

As it concerns the use of 48 months of **already-curtailed** historical wind generation as input data into the Aurora model, these data inform about 35 percent of all the wind generation input data feeding the Aurora model. In Aurora, those input generation data are then conformed to fit within modeled eastern Wyoming transmission constraints (again subject to other operational constraints).

Why already-curtailed 48 months of historical generation data still need more curtailment in the Aurora model: Even though the historical wind data already includes curtailments, using it as project-by-project wind generation inputs in the Aurora model still requires further curtailment. The reason is asynchrony:

- Each wind project's input generation is built individually, without consideration of other wind project's input generation, and

- Transmission availability in those histories does not align across all the projects.

This creates a systemic issue: during periods of high wind found in the 48-month historical data; multiple projects can be seen to produce high output at the same time. The sum of those outputs can exceed available transmission capacity in the eastern Wyoming region, even though each individual project's output appears "reasonable" on its own.

Compounding issues that amplify the overstatement of model input generation from 48 months of historical wind generation data:

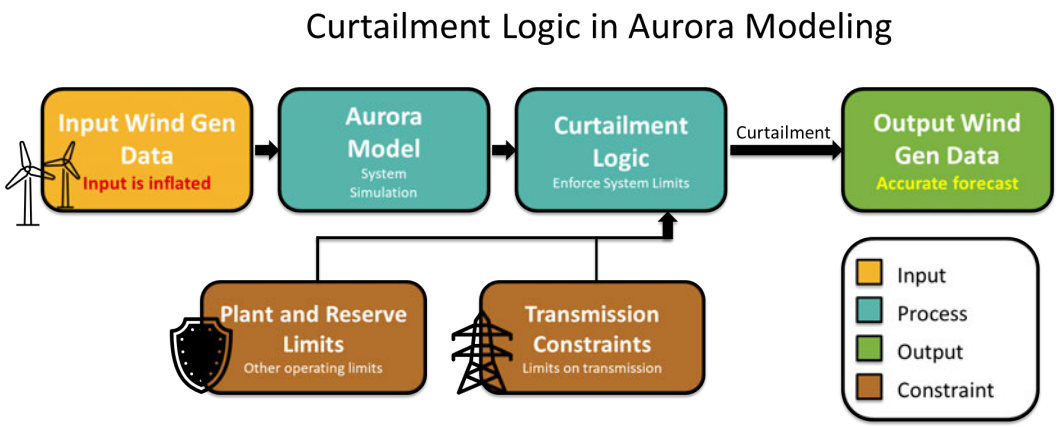
1. Staggered commercial operations: During turbine re-powering as part of PacifiCorp's Energy Vision 2020 (EV 2020), wind projects came offline, were repowered over the course of a year, then came online one after another, not all at once.

2. Therefore, not all projects were online during the 48-month historical period used to calculate the input generation data for some projects.

3. Therefore, early projects' input generation data reflect conditions when fewer projects were online and therefore had less competition for transmission, so those input generation data are inflated relative to today's reality.

Result: Whether based on 48 months of historical wind generation or on "P50" (pre-construction vintage) wind generation estimates (**pre-construction vintage wind generation estimates do not account for transmission congestion**), the aggregate inputs to the Aurora model **will overstate deliverable wind energy**, producing forecasts that **cannot be achieved** in actual operations.

Resulting modeling approach: To keep forecasts accurate, physically realistic and within transmission limits, the Aurora model **treats input wind generation data as curtailable**. Without allowing curtailment, the total modeled **output wind generation** would routinely exceed what the transmission system can handle, forcing the model to violate operational constraints just to hit inflated totals.



This underscores why curtailment logic is essential and why forecasts based on 48 months of curtailed, historical data are still too high without additional curtailment—at least until we have four years of data from an unchanging set of generation and transmission assets. **This approach ensures that net power costs (NPC) are based on deliverable, not merely theoretical, wind energy**.

UE-250224 / PacifiCorp
October 22, 2025
Bench Request 02

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Confidential information is provided subject to WAC 480-07-160 and the protective order in this proceeding.

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