



Submitted by	Company	Date Submitted
Christine Kirsten christine.kirsten@pacificorp.com 916-207-4693	PacifiCorp	March 21, 2019

**PacifiCorp’s Comments on the Day-Ahead Market Enhancements
Phase 1: Fifteen-Minute Granularity
Third Revised Straw Proposal**

PacifiCorp hereby submits the following comments to the California Independent System Operator Corporation (“CAISO”) on the Day-Ahead Market Enhancements (“DAME”): 15-Minute Granularity third revised straw proposal, published February 28, 2019 (“Straw Proposal”). PacifiCorp appreciates the opportunity to provide comments for the CAISO’s consideration.

Federal Energy Regulatory Commission Tariff Filings

PacifiCorp anticipates that it may need to revise its tariff in order to implement the proposed changes. As a result, PacifiCorp requests that the CAISO consider this and coordinate with EIM entities on the timing of filing its tariff revisions with the Federal Energy Regulatory Commission (“FERC”), to ensure that the implementation date corresponds with the EIM entities’ FERC approvals and effective dates for their tariff revisions.

Base Schedules and Bids Submitted with 15-Minute Granularity

PacifiCorp agrees that scheduling at a 15-minute granularity versus hourly granularity more closely aligns with expected real-time conditions and enables non-participating resources to provide needed flexibility to the system. However, the ability to submit schedules and bids with 15-minute granularity is dependent on the ability of the software vendors to modify, test and deliver updated software, and will likely require modifications to EIM entities’ internal business processes. PacifiCorp recommends that the CAISO publish proposed technical specifications and business practice revisions as early as possible prior to implementation. Further, as these market enhancements will require a large collaborative effort to successfully implement the system changes, PacifiCorp requests that the CAISO provide a minimum of 60 days for the operational users to test this functionality before implementation. In the event the 60 days that was originally allotted in the schedule for testing purposes is unavailable prior to the expected implementation date, PacifiCorp requests that the CAISO delay implementation to accommodate this necessary step.

In the past, stakeholders have requested clear Exit Criteria for market simulation start, including defined timelines and metrics to guide deployment decisions (Go/No-Go/Delay). The lack of criteria and subsequent release with known issues in place leads to issues that can take weeks to months to resolve. This then causes long-term settlement consequences due to 55-day and 9-month



settlement timeframes. Due to the complexity of this change and significance of market model and settlement statement impacts, the CAISO should identify clear performance criteria, including final settlement statements, in its implementation plan.

Settlement of Regulation Energy in EIM

The CAISO proposes to settle the uninstructed response to automated generation control (“AGC”) as regulation energy, which is classified as instructed imbalance energy, with a separate implementation scheduled in the fall of 2019. PacifiCorp would like to better understand the technical details of how it would identify regulation energy in its operational plan, as well as what the effect of this would be for purposes of the flexible ramp sufficiency test. Please provide more detailed information of the expected functionality of identifying resources that are providing regulation energy in the draft final proposal.

Unit Commitment

The CAISO is proposing to restrict the day-ahead market to hourly unit commitment for all resources, including multi-state generator (“MSG”) transitions. It would be ideal for the CAISO to allow the day-ahead market to commit resources at the start of every 15-minute interval. However, achieving this goal would quadruple the number of binary variables used in the day-ahead market unit commitment process. The CAISO’s technology team has explained that this is not feasible given the day-ahead market time horizon of 96 15-minute intervals and is a primary reason why the CAISO needs an additional hour for the day-ahead market to solve.

While PacifiCorp is supportive of moving to a fifteen-minute scheduling granularity, for all the reasons cited by the CAISO, the benefits of this change may be diminished due to an inability of the model to commit resources at the 15-minute level. If it has not already done so, the CAISO should re-evaluate expected benefits of implementing the 15-minute scheduling requirement without unit commitment. PacifiCorp is also concerned that this may impact the future implementation of an extended day-ahead market (“EDAM”). Given the allotment of computing resources that will be required to implement the currently proposed modification, EDAM implementation might also require changes in the model to accommodate a co-optimized process. PacifiCorp is concerned that EDAM may necessitate further simplification of the market model for the sake of processing time.

Bid Segment Fee

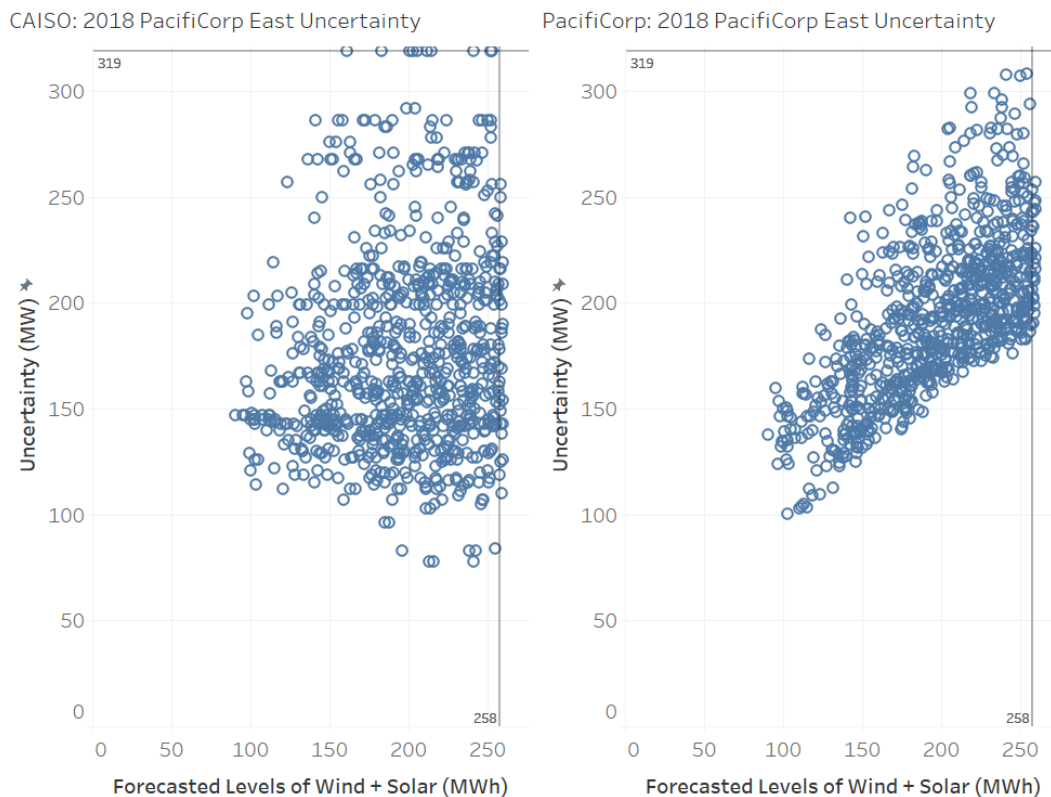
During the stakeholder meeting, a stakeholder asked whether or not the CAISO had considered reducing the bid segment fee, as the number of bid segments in a day will quadruple with the implementation of 15-minute bidding. The CAISO responded that the bid segment fee is relatively small, but agreed to following up on it. PacifiCorp notes that regardless of the de minimis amount of the charge, the bid segment fee should be adjusted to appropriately apply to 15-minute bidding.



Flexible Ramp Sufficiency Test Uncertainty Calculation

Although outside the scope of Phase 1 of the DAME, PacifiCorp would like to stress its concern regarding the flexible ramping product (“FRP”) uncertainty calculation component and real-time uncertainty calculation. Due to a disconnect between forecast levels of variable energy resources (“VERs”) and the uncertainty calculation, PacifiCorp’s system is being required to hold upward capacity beyond its needs. This results in the need to hold capacity when it is operationally unnecessary to do so. This issue is critical to PacifiCorp and, to resolve this issue, the CAISO should place greater priority on incorporating forecast levels of load, wind and solar in the determination of the real-time flexible ramp requirement.

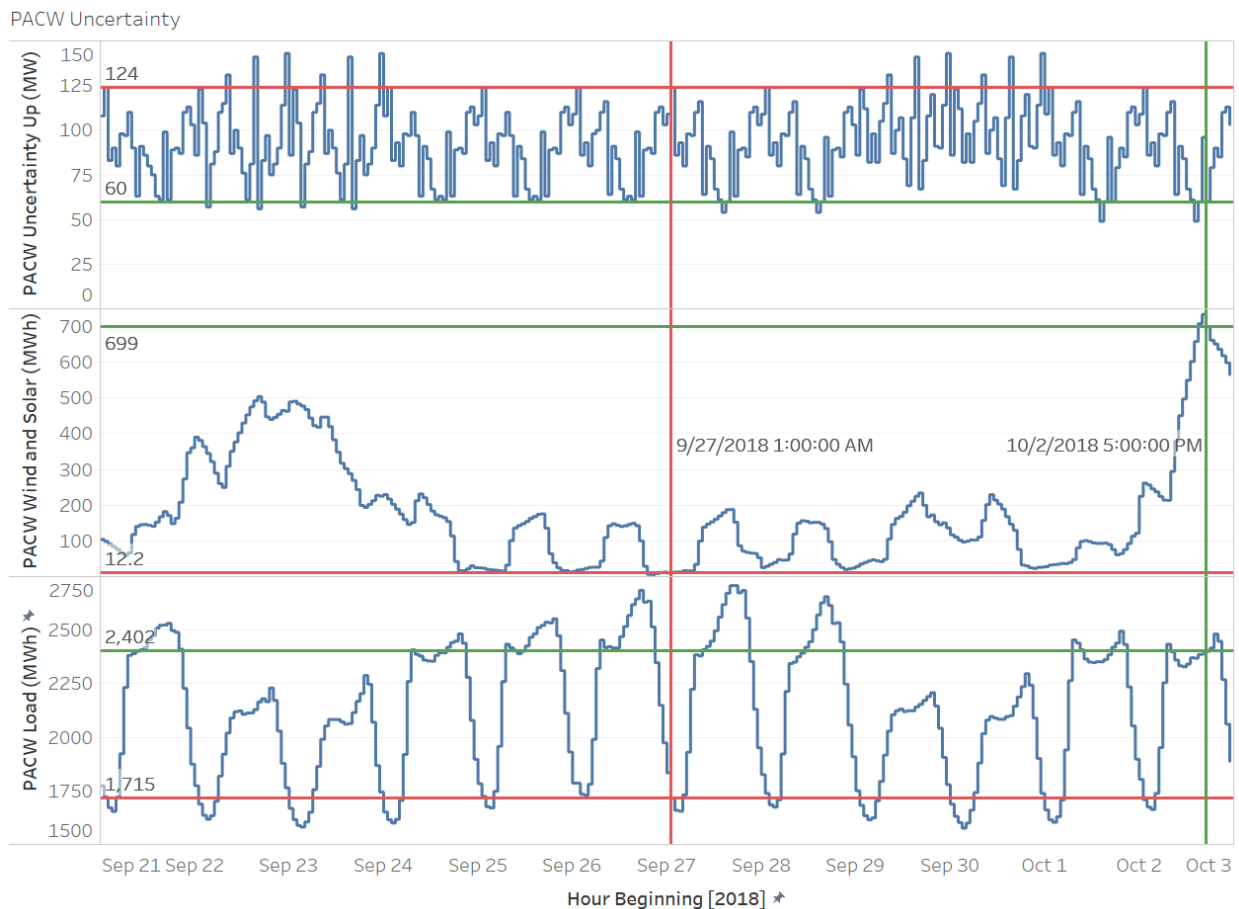
Today, PacifiCorp has a large level of wind and solar within its operating system that increases its need for intra-hour flexibility due to forecast uncertainty. PacifiCorp’s internal uncertainty calculation is dependent on the respective levels of wind, solar and load forecast for each hour and allows PacifiCorp to operate in a reliable manner. However, the CAISO’s calculation of uncertainty that is included in its flex ramp sufficiency test can vary from the requirement that PacifiCorp has calculated due solely to the fact that the CAISO does not include the forecast levels of wind and solar. The below illustration compares the relationship between forecast levels of wind and solar VERs and the current uncertainty requirement in the up direction as calculated by the CAISO and as calculated by PacifiCorp for internal needs in 2018 for the PacifiCorp East (“PACE”) balancing area during the nighttime hours.





The illustration above shows that there is no relationship between the forecast levels of VERs and the CAISO upward uncertainty requirement. This disconnect between forecasts and uncertainty requirements has the PACE system holding upward capacity above and beyond its needs at low VER forecast levels.

Not accounting for forecast levels of wind and solar often leads to nonsensical results. Observe the below conditions in the PacifiCorp West (“PACW”) balancing area on September 27, 2018, at 0100 Pacific Daylight Time (“PDT”). On September 27th, the VER forecast is 12 megawatt-hours (“MWh”) and the load forecast is 1,715 MWh. During this period the CAISO flexible ramp sufficiency test required PacifiCorp to hold 124 MW of upward capacity. In contrast, on October 2, 2018, at 1700 PDT the VER forecast is 699 MWh and the load forecast is 2,402 MWh while the upward capacity requirement is 60 MW. It is nearly impossible to make the argument that the upward uncertainty in the middle of the night with a negligible wind forecast is twice as great as the upward uncertainty during the evening peak where wind and solar combined is forecast to be approximately one third of load.



Furthermore, as more renewables are integrated into the portfolios of the various EIM entities, the magnitude of the uncertainty requirements will likely increase. This increase, coupled with the



disconnect between forecast levels and the uncertainty requirements, will result in situations where entities may incur costs procuring energy in the bilateral markets to satisfy an upward requirement that is operationally unnecessary. While PacifiCorp does not advocate for this position, it may become economically and strategically optimal for an EIM entity to fail the flexible ramping sufficiency test in the upward direction if the entity is a net exporter during the relevant interval and believes it has sufficient upward flexibility relative to its forecast levels of wind and solar.

Procuring energy in the bilateral market in order to free up unnecessary upward capacity on the PacifiCorp system for both balancing authority areas, solely for the purpose of passing its flexible ramp sufficiency test and not for reliability reasons, is costly and may occasionally offset the benefits gained by participating in the EIM. This is true not just for PacifiCorp but for all EIM entities. Given the current and potential impacts of this issue, the CAISO should immediately prioritize a remedy to this issue and provide more detail as to the timeline of when the real-time market may see a more accurate calculation of real-time uncertainty.

Conclusion

PacifiCorp appreciates the CAISO's consideration of these comments and looks forward to further dialog.