

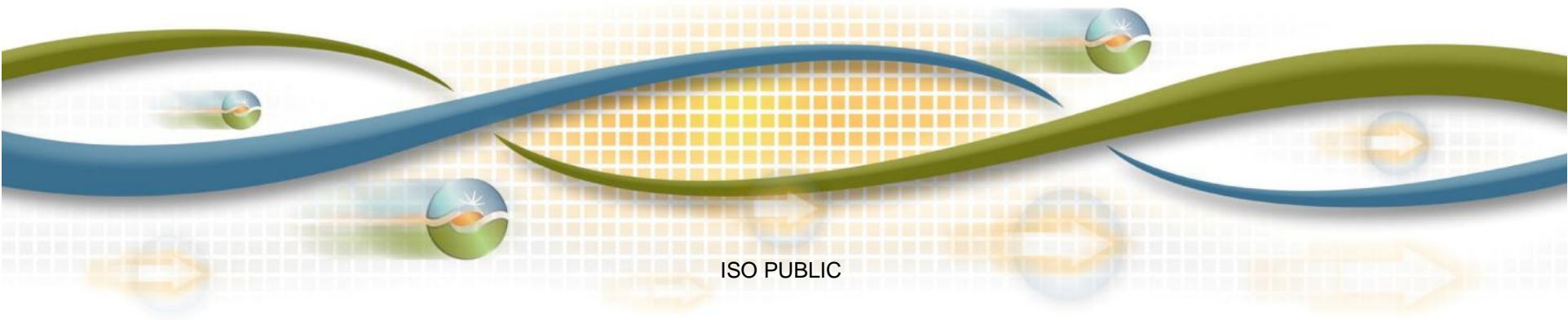


California ISO
Shaping a Renewed Future

CPUC Public Workshop – 11/07/2017

CAISO Overview Variable Energy Resource VER Use of Forecasts in Markets

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Weather-Sensitive Demand Response Treatment Raised in Multiple Forums Including ESDER initiatives

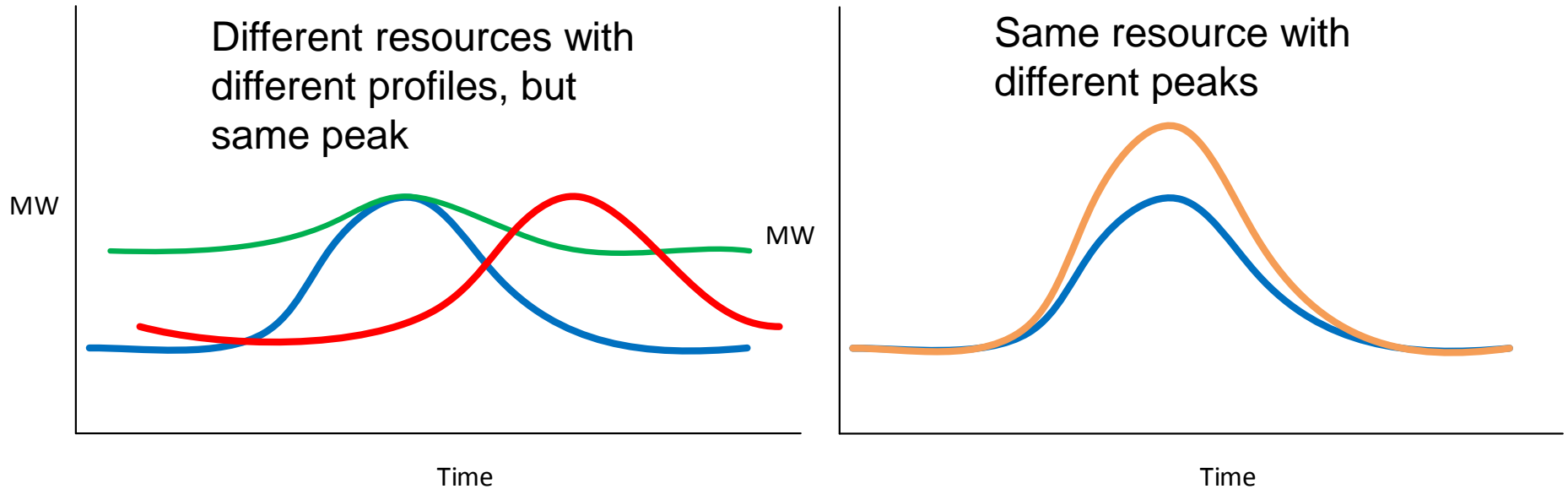
Weather-sensitive DR cannot deliver a fixed resource adequacy qualifying capacity amount since its capability depends on weather conditions.

- ESDER initiative proposed that this issue requires vetting by the CPUC/LRA because the resource adequacy qualifying capacity rules are established by the LRA.

Open questions with VER treatment for ISO market participation:

- Are there similarities with weather sensitive DR and VERS for QC valuation? Application of an effective load carrying capacity ELCC? Or, other RA impacts?
- In addition to VER market treatment, how should weather sensitive DR be treated for NQC, MOOs, or RAIM?

Qualifying capacity valuation methodology should be consistent across DR resources while still reflecting the reliability benefits



Other considerations

- Number of starts
- Frequency of call
- Duration of dispatch

VER treatment in the markets utilizing forecasts and real-time data

FMM dispatches will be awarded at the FMM price, this will be subject to further modification in RTD

FMM:

Thirty minutes ago we forecasted where you would be

- ✓ *Your solar farm received a 50 MW schedule*

RTD:

Utilizing the most updated information, including telemetry, we see that you can now only produce 45 MW

- ✓ *Your solar farm receives a 45 MW dispatch*
 - The 5 MW difference is settled as a real time imbalance energy

Updated forecast and real-time data provides more accurate and feasible RTD results

Questions to ask about weather sensitive demand response utilization of the CAISO VER model

- Is it feasible and not cost prohibitive for the weather sensitive DRs to provide accurate forecasts and real time visibility (telemetry) in the manner used by VERs?

Appendix

Additional VER Market Participation Information

Variable Energy Resource (VER) participation barriers were addressed with FERC 764 market enhancements

Changes were made to provide VERs the ability to submit bids based on their forecasts closer to financially binding intervals

- Allowed VERs to be bid four times an hour rather than once an hour using resource specific forecasts in the 15-minute market (FMM):
- Each 15 minute schedule is based on the average of the three relevant 5 minute interval forecasts received 37.5 minutes in advance
 - A VER's submitted bid is limited or extended to a dynamic upper dispatch limit for each 15-minute interval in the time horizon.

All VERS are subject to forecasting costs

5-Minute VER Forecasting Enable VERs to Economically Bid

Forecasts are utilized to establish an upper limit on schedules and bids.

- VER forecast submission is submitted in RT every 5 minutes on a rolling basis meeting market timelines.
 - 5 minute dispatch based on the relevant forecast received 7.5 minutes in advance
- Although SIBR is used for submitting the forecast, the forecast is not a bid.
 - Bids must still be submitted
 - The forecast is utilized to automatically update the upper economic limit of the bid curve potentially affecting the market award.

Requires variable energy resources to provide meteorological (via telemetry) and forced outage data for the purpose of power production forecasting