

May Monthly Meeting

Chair: Thad LeVar

Vice-Chair: Hayley Williamson

Staff: Bonnie Lamond, Woori Lee

May 12, 2023

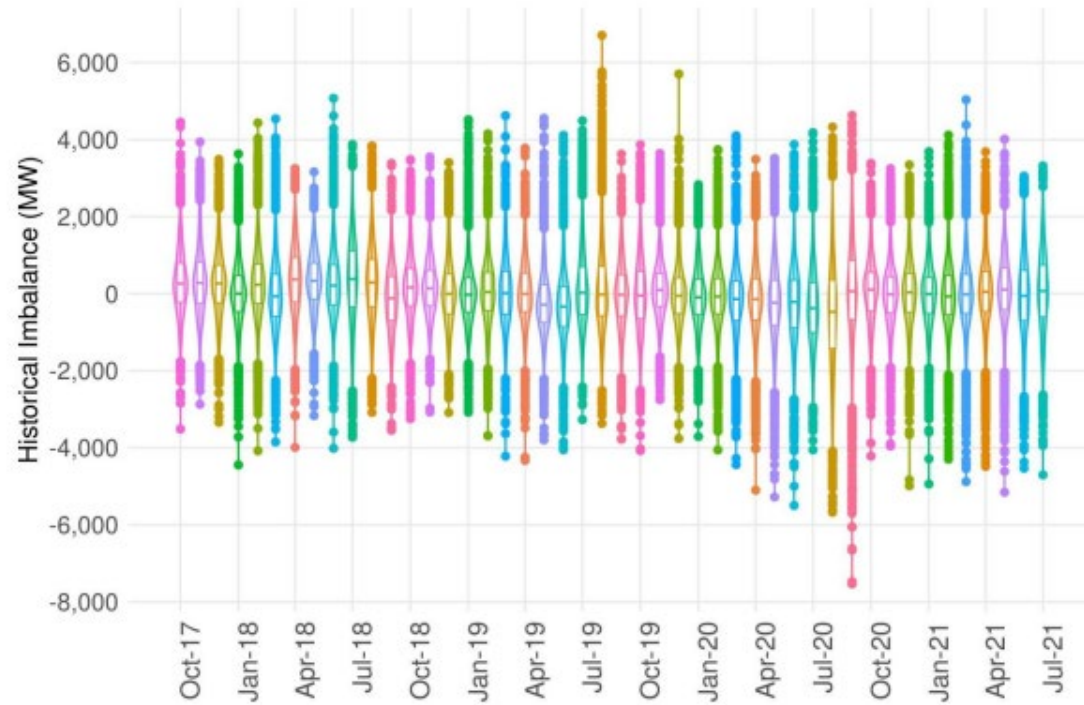
Agenda

- **Welcome Remarks and Announcements** – *Chair LeVar, BOSR Chair*
- **Day-Ahead Market Enhancements** – *Woori Lee, Wholesale Electricity Markets Analyst, WIEB*
 - **Background of the Initiative**
 - **Overview of Imbalance Reserve Product**
 - **Potential Implications of the New Design**
 - **Decisional Classification**
- **GHG Update** – *Anja Gilbert, California ISO*
- **Upcoming Meetings**

Woori Lee, *Wholesale Electricity Markets Analyst*

Background of the Initiative

Energy Imbalances Trends



The shape of the plots shows the density and type of distribution of Imbalances

Net load uncertainty continues to grow

- 1) Increasing grid-connected renewables
- 2) Increasing behind the meter distributed energy resources
- 3) Increasing extreme weather conditions



- Energy imbalances between day-ahead and real-time are becoming larger and steeper and poses operational risks
- The inherent uncertainty in VER forecasting necessitates flexible capacity reserves that can respond quickly
- Out-of-market actions have increased in frequency and magnitude

Proposed Enhancements

1. Introducing an Imbalance Reserve Product (IRP) in the IFM

2. Enhancing the Residual Unit Commitment (RUC) process to enable resources to economically bid compatible with EDAM structure

Introducing new capacity products in the day-ahead market

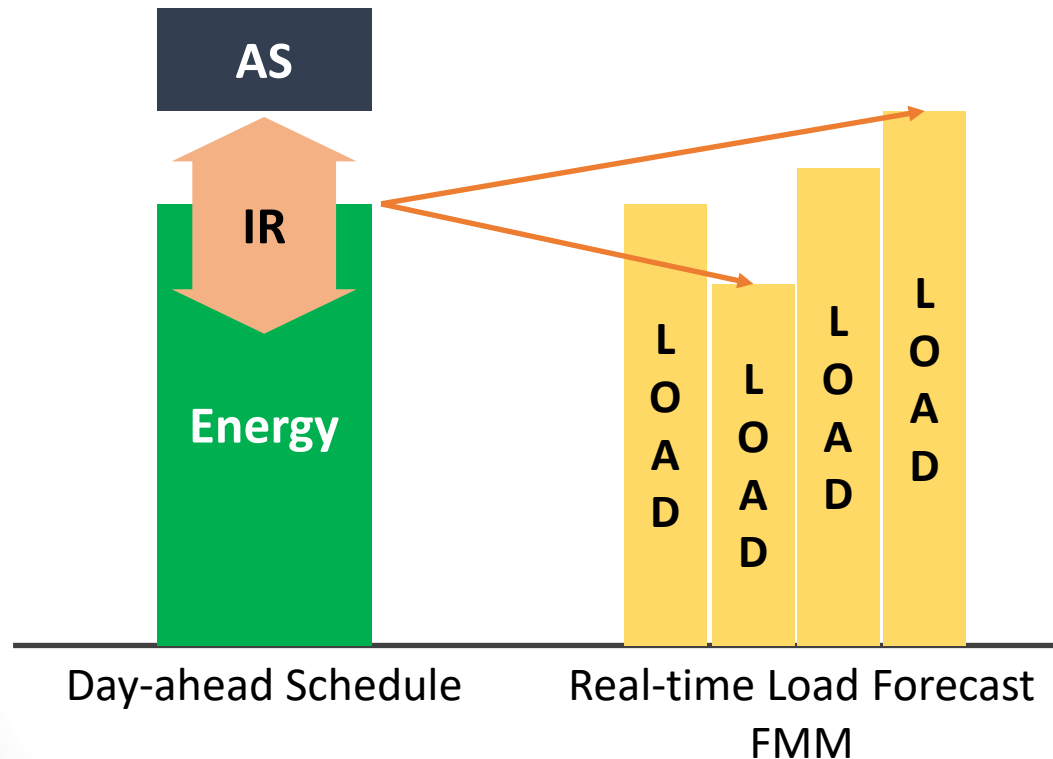
Benefits of the Enhancements

- Imbalance reserves ensure the system has sufficient ramping capability
- By including the imbalance reserve in the IFM, greater optimal unit commitment decisions and allocation of system ramping capability can be achieved
- Reduce out-of-market actions
- Enhance price convergence between markets
- Maximize the diversity benefits of the EDAM

More efficient and effective market outcome

Imbalance Reserve Product Overview

- Imbalance Reserve Product (IRP) is the additional capacity product to cover net load uncertainty and granularity differences between the DAM and RTM



- Provides market with flexible resources when there is imbalances between DAM and RTM
- Awards based on 30-minute ramp capability
- Co-optimized with energy and ancillary services in the Integrated Forward Market (IFM)

Proposed Design

① Bidding Rules

Market participants submit separate bids for energy, A/S and imbalance reserves

In order to bid for IR, resources must provide an energy bid in the day-ahead market

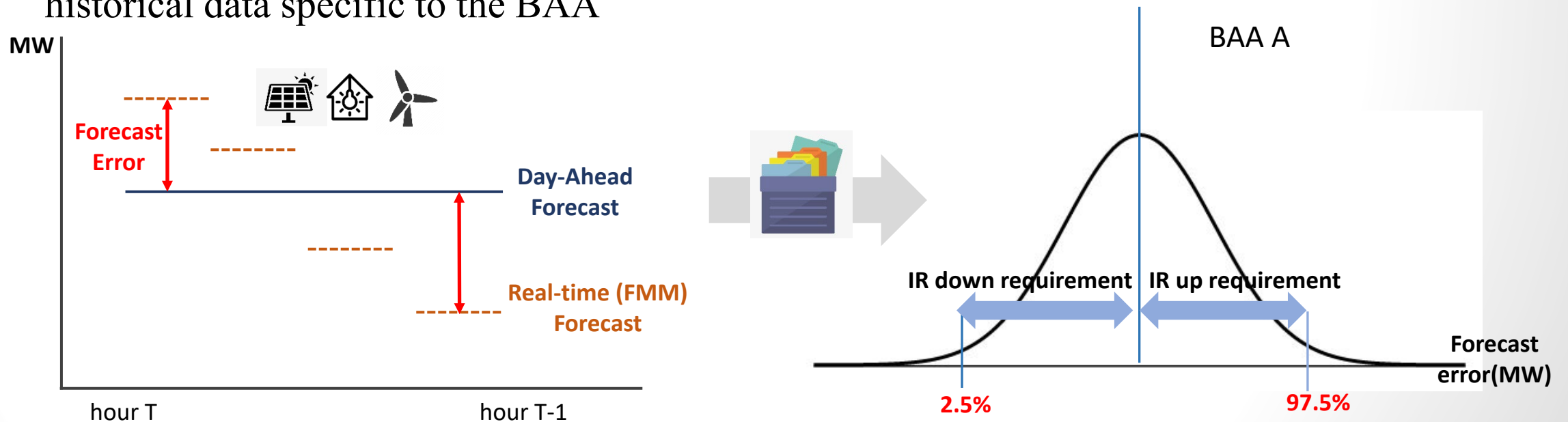
The imbalance reserve bid prices will be capped at \$55/MWh

Resources that receive an energy schedule, A/S awards and imbalance awards in the DAM will have RTM bidding obligations, which ensures there are sufficient offers to allow the real-time market to dispatch the resources

Proposed Design

② Imbalance Reserve Requirement

- An EDAM BAA must offer Imbalance Reserve to meet its RSE obligations
- Historical data will be used to identify the load, wind, and solar forecast error (upward direction 97.5th, downward 2.5th percentile) between the DAM and RTM
- The CAISO will calculate the IR requirement for each EDAM BAA separately using historical data specific to the BAA

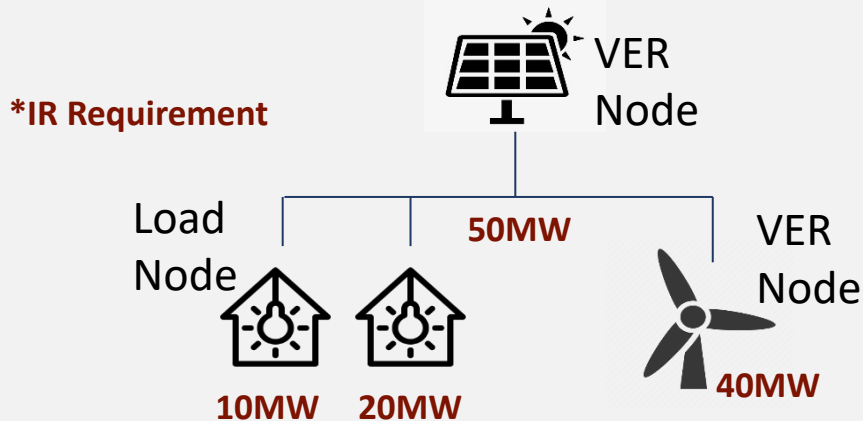


Proposed Design

③ Deliverability of IR

Distribution of IR Requirement

- The market considers transmission constraints when awarding Imbalance Reserves to ensure they are deliverable if deployed in real-time
- In the system, this would result in nodal IR distribution and nodal IR pricing



Potential Implication

- Most of the IR awards might not be materialized in the real-time
- The unrealistic assumptions can impact LMP
- Depending on the location of nodes, IR can be over/under procured

Proposed Mitigation Measure

- ✓ Flexible activation/deactivation of individual transmission constraints
- ✓ Tunable parameter to define the proportion of imbalance reserve awards

Proposed Design

④ Setting the Price of IRP

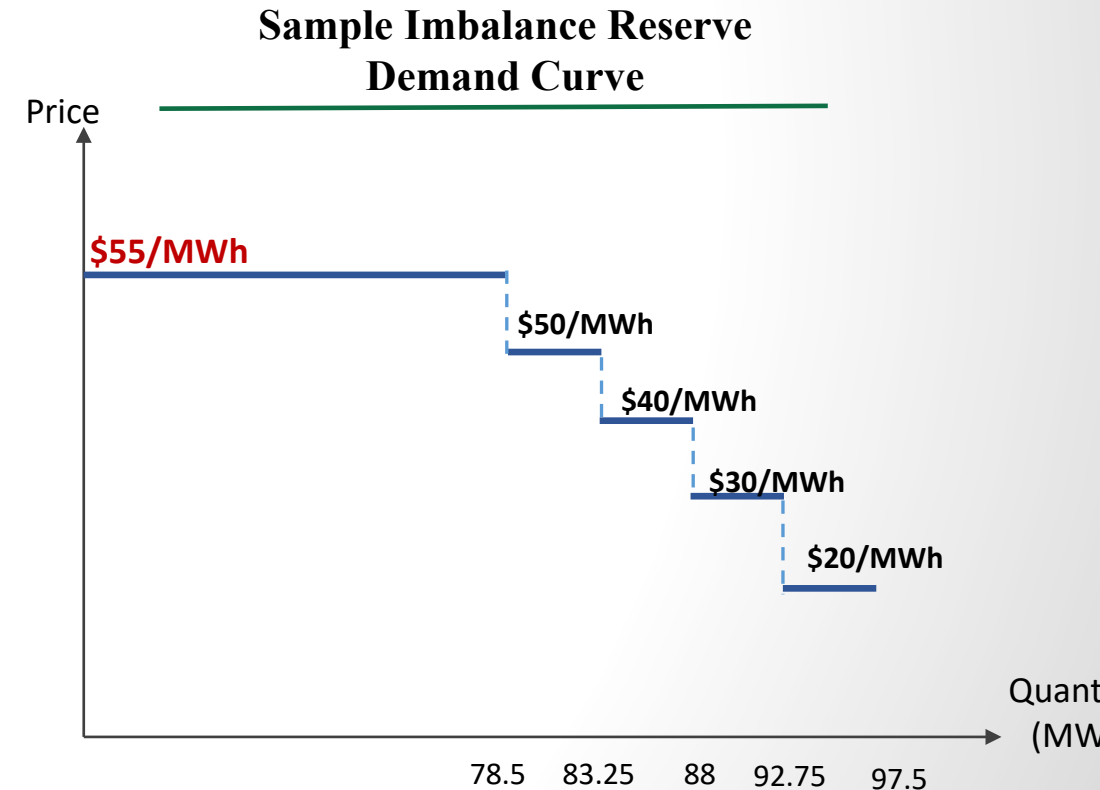
CAISO proposed an “Imbalance Reserve Demand Curve” to set the price of the IR product

Demand Curve

- The “Demand Curve” is used as a pricing mechanism for operating reserves in many RTO/ISOs
- It determines reserve prices reflecting the value of loss (penalty price)
- It allows the market to determine how much will be procured

Proposed IR Demand Curve Construct

- ✓ The bid cap is set at \$55/MWh, which is the current spinning reserve price
- ✓ The penalty value is set at \$247, which is the lowest penalty price for violating contingency reserve requirements



Imbalance Reserves in the EDAM

- Reduces each EDAM BAA's individual net load uncertainty requirements and capacity procurement through the EDAM diversity benefit
- Builds confidence in energy transfers between BAAs scheduled in the day-ahead market through a common market product
- Imbalance reserves will more efficiently select the resources to provide these reserves at a lower cost than their own resources by allowing BAAs access to resources across the EDAM
- Imbalance reserves establish a consistent treatment of “flexibility” in the EDAM resource sufficiency evaluation

Potential Implications

- Since the market will require each BAA to procure a high level of uncertainty, the final cost of procuring the imbalance reserve can be greater than its actual value
- Including a flexible capacity product in the day-ahead market optimization can have adverse impacts on congestion and market participant behavior which in turn may lead to distortions in market prices
- The value of the imbalance reserves could be significantly less than the proposed demand curve values, which will add unnecessary costs to the day-ahead market

Decisional Classification

- All aspects of the initiative fall under Joint Authority approval with one exception relating to California RA resources
 - The elements of DAME are foundational for EDAM
 - The IRP drives a significant portion of the potential benefits of EDAM
- Exception: a bidding obligation for California RA resources – specifically, must-offer obligation in the day-ahead market for RA capacity that is eligible to provide imbalance reserves (i.e., 15 minute dispatchable)

Anja Gilbert, *California ISO*

Upcoming Meetings

- May 16: Western EIM Governing Body Meeting
- May 17: Joint Governing Body and ISO Board of Governors Meeting
- June 9: BOSR June Meeting
- August 17-18: Western Markets Training Forum