



Organized Day Ahead Markets

Libby Kirby, Market Initiatives Policy Lead



Why is Our Team Here Today?

- Power products were developed in the context of bilateral markets
 - This context is changing as entities join organized markets.
- Analysis of potential market options must be closely aligned with the development of our power sales contracts to ensure:
 - To the extent possible, markets are designed in a manner that is compatible with power products.
 - Power products for Post-2028 are developed such that they that could be compatible with a day ahead market.

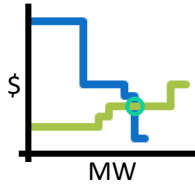
BPA Market Engagement

From John Hairston's letter to Public Power Council (August 11, 2022):

- Bonneville is exploring the potential for organized energy market options to enhance its delivery of reliable, affordable and carbon-free hydropower to our customers.
- As part of this exploration, Bonneville is actively engaged in the development of two day-ahead energy market initiatives in the West: SPP's Markets+ day-ahead and real-time market initiative and the CAISO's Extended Day-Ahead Market (EDAM) initiative.
- Bonneville will continue to evaluate both market options and has decided to commit resources to support and fully evaluate Markets+, including funding Bonneville's share of the next implementation phase.
- Bonneville has not made a decision to join Markets+ as a market participant. Bonneville would hold a public process before deciding to participate in any market, as we did before joining CAISO's Western Energy Imbalance Market.

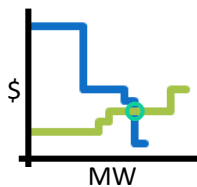
What is a Day Ahead Market?

Footprint-wide Security Constrained Unit Commitment/Economic Dispatch (SCUC/SCED) performed day-ahead at hourly granularity

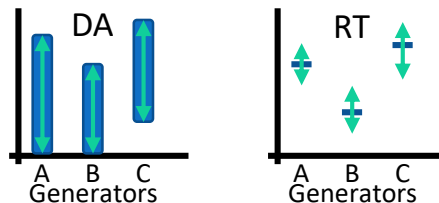


What is a Day Ahead Market?

Footprint-wide Security Constrained Unit Commitment/Economic Dispatch (SCUC/SCED) performed day-ahead at hourly granularity

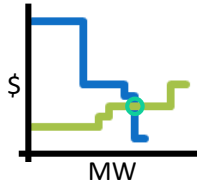


Larger volume than real-time markets; setting expected energy output of generators rather than incremental to expected output

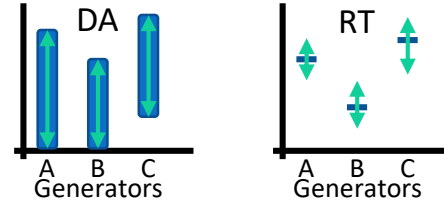


What is a Day Ahead Market?

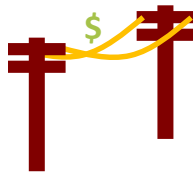
Footprint-wide Security Constrained Unit Commitment/Economic Dispatch (SCUC/SCED) performed day-ahead at hourly granularity



Larger volume than real-time markets; setting expected energy output of generators rather than incremental to expected output

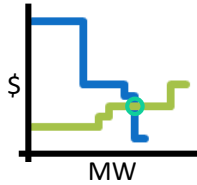


Larger utilization of transmission system than real-time markets

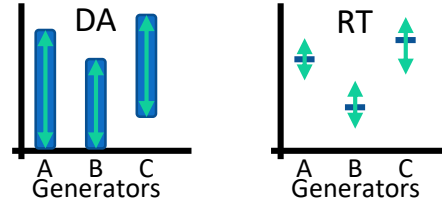


What is a Day Ahead Market?

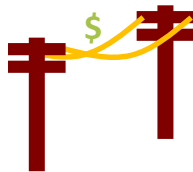
Footprint-wide Security Constrained Unit Commitment/Economic Dispatch (SCUC/SCED) performed day-ahead at hourly granularity



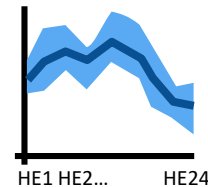
Larger volume than real-time markets; setting expected energy output of generators rather than incremental to expected output



Larger utilization of transmission system than real-time markets



Includes footprint-wide flexible reserves to cover load/gen uncertainty



Incremental Market Functions

Real-Time Market

Day-Ahead Market

- Includes participation in the associated real-time market

RTO

- Includes participation in associated day-ahead and real-time markets
- Adds coordinated transmission planning, transmission service provision, BAA consolidation, ancillary services market

Related Functions

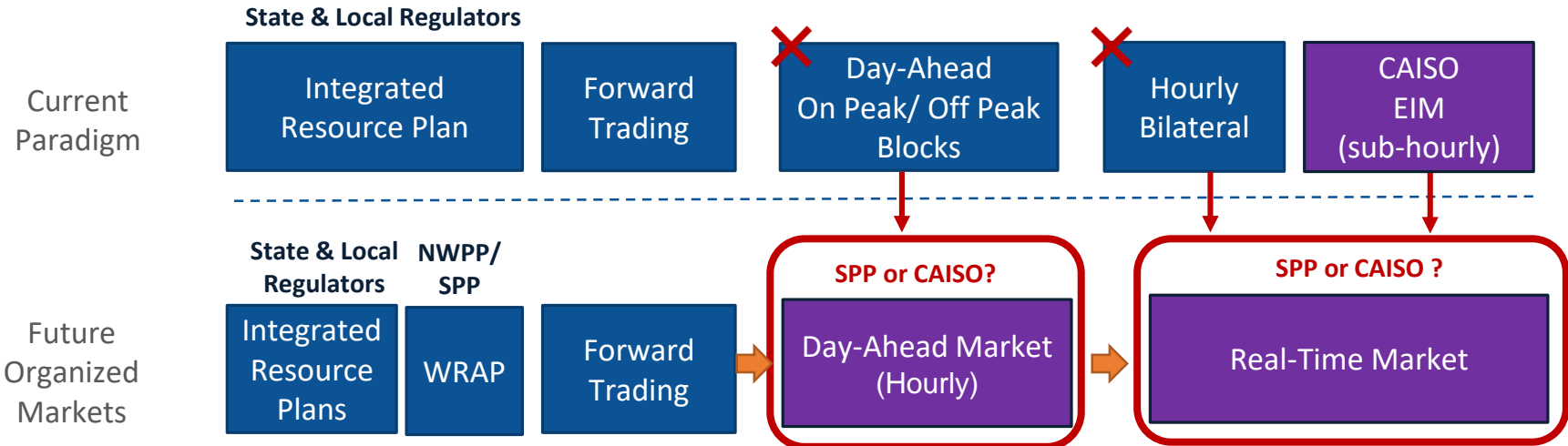
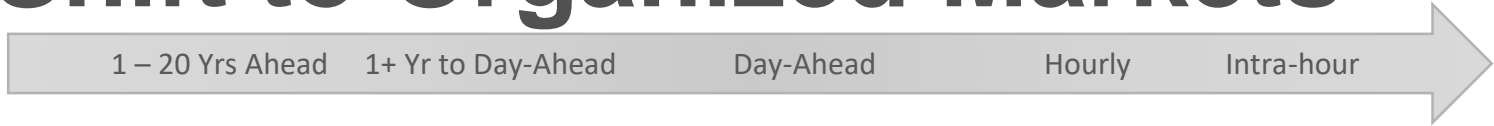
- Reliability Coordinator
- Resource Adequacy (WRAP - SPP)

Why DAMs?

General benefits of DAMs include:

- Market availability for balancing purchases & surplus sales
 - Bilateral liquidity expected to decrease as DAMs grow
- Economic dispatch/commitment of bid-in resources
- Potential for compensation for flexible capability
- Diversity benefit – larger pool of resources/loads
- More efficient integration of variable energy resources
- More efficient use of existing transmission
- Coordinated management of uncertainty and operations

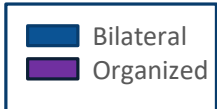
Shift to Organized Markets



Planning Horizon:
 What resources are needed?
 ("steel in the ground")

Mid-term/Risk Horizon
 Positioning for operating horizon

Operating Horizon:
 Which resources should run?
 (economic dispatch)



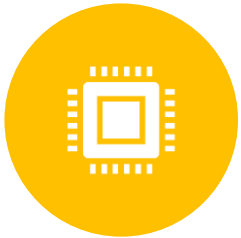
What's Changing in an Organized Day-Ahead Market



Day-Ahead and Intra-Day bilateral markets lose significant liquidity



Day-ahead bilateral block trading is replaced by resource offers and load bids that result in optimized transactions through the market with hourly granularity

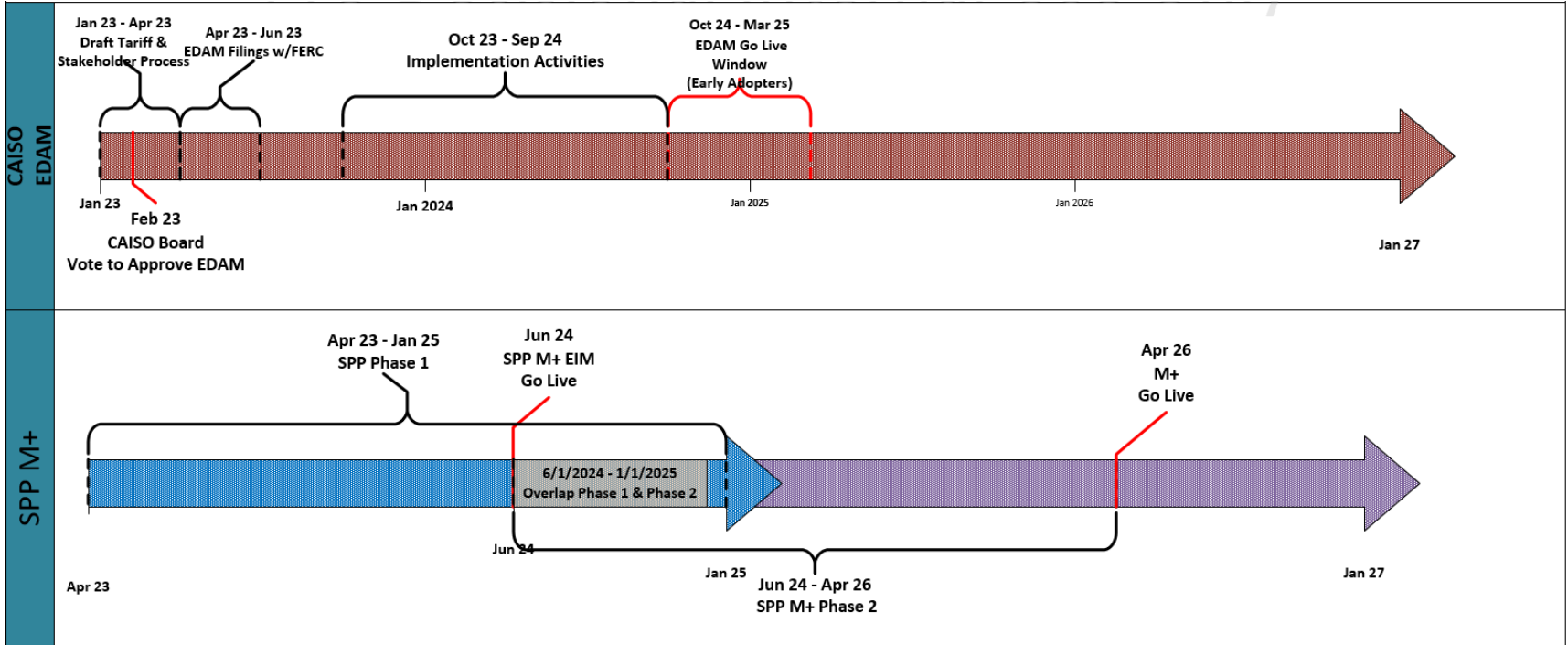


In the day-ahead and real-time horizons, the market operator optimizes all supply to the entire market footprint



Uncertainty between day-ahead and real-time is managed by the market through procurement of uncertainty and ramp products as well as intraday “reliability unit commitment” (RUC) processes

Markets+/EDAM Est'd Timeline



Timeline Overlay



Questions?

Please direct any comments or inquiries related to BPA's Market Initiatives to:

BPAMarketInitiatives@bpa.gov

Market Initiatives Team:

Matt Hayes, Stakeholder Engagement Lead: mchayes@bpa.gov

Russ Mantifel, Director of Market Initiatives: rxmantifel@bpa.gov

Libby Kirby, Policy Lead (Transmission): eakirby@bpa.gov

Andy Meyers, Policy Lead (Power): apmeyers@bpa.gov