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Continued Discussion on Regional Electricity Markets & BPA Impacts

Jefferson PUD Board Meeting

August 10, 2021

Proposed Settlement

- Average 2 to 2.5% decrease in wholesale power rates proposed
  - Compared to 0% change in BPA's initial proposal
- Key Driver: adopt PPC's proposal to cap revenue financing in power rates at $40M per year (compared to $95M or more in BPA's initial proposal)
- Still not final, updates to come
- Individual utility impacts and situations vary substantially
- Outcome of cooperation among public power

Intro to Regional Electricity Markets & BPA Impacts

Organized Markets

- In economic terms, electricity is a commodity capable of being bought, sold, and traded.
- An organized market is simply a system – created pursuant to a particular set of rules and operated by a “market operator” – that matches demand for electricity (through bids to buy) and supply of electricity (through offers to sell).
- Generation dispatch is centralized and determined by the market operator consistent with market rules.
- Contrast with outside-the-market power purchase agreements, which are generally private bi-lateral transactions between counterparties.

Why Organized Markets

- Regional Perspective:
  - Reduce inefficiencies through centralized dispatch.
    - More complete information results in least cost dispatch.
    - Reduces transactional costs/barriers (in bilateral world need to have alignment between generation/transmission/load).
  - Larger footprint creates diversity benefits.
    - Especially important with variable resources.
- Individual Entity Perspective:
  - Can allow access to less expensive generation than current portfolio.
  - For low cost resources, provides additional sales opportunities.

Potential Concerns with Organized Markets

- Regional Perspective:
  - Poorly designed markets can create economic and operational risks across a larger footprint.
  - Increased volatility compared to bilateral for most participants.
    - Upward and downward risk.
    - The extent of this is determined both by market design and the manner in which entities participate.
- Individual Entity Perspective:
  - Entities may not receive equal shares of regional benefits of an organized market.
    - Market design perspective.
  - Potential transparency challenges due to market complexity.
  - Market design will determined the risk exposure and benefits for individual entities.
  - Moving to an organized market may shift costs and benefits compared to status quo.
    - Transmission is a great example.

Risks and Benefits of Markets Differ Depending on Market Structure & Design

- Energy Imbalance Market
  - Least risk & benefit, impacts a small amount of transactions.
  - Optimizes resources online in real-time.
- Day-Ahead Market
  - Larger risk & benefit, impacting a larger number of transactions.
  - Largely determines which resources are available ("committed") for the next day.
    - Creates significant savings by decommiting expensive resources.
    - Can also create additional reliability and economic risk if poor market design does not result in sufficient resources.
- Regional Transmission Organization/Independent System Operator
  - Largest risk & benefit, nearly all functions impacted.
  - Centralization of grid operation, dispatch and planning.
    - Benefits through most efficient use of regional resources & regional planning.
    - Risk through reduced autonomy and reliance on market outcomes for all aspects of power supply.

Consideration for BPA's Participation in Organized Markets

- Power
  - Potential revenue opportunities for BPA – consistent with BPA strategic plan and PPC's objective to keep BPA power product competitive.
    - Highly dependent on market design, BPA's approach to participation, **and BPA rate design.**
  - Important that BPA retains ability to manage its system (set constraints on dispatch) under any organized market.
- Transmission
  - Potential to relieve constraints on the transmission system through real-time dispatches.
    - Could avoid curtailments or some small investments on the transmission system.
  - Anything beyond EIM has significant rate and operational challenges.
    - What level of control does BPA retain operational?
    - Cost shifts to users of the Transmission system compared to today.

CAISO Initiatives and Background

What is CAISO?

- In CAISO BAA
  - Grid Operator
  - Grid Planning
  - BAA Responsibilities
  - Administers DA Market
  - Administers RT Market
- In EIM Footprint
  - Administers RT market

North American Independent System Operators

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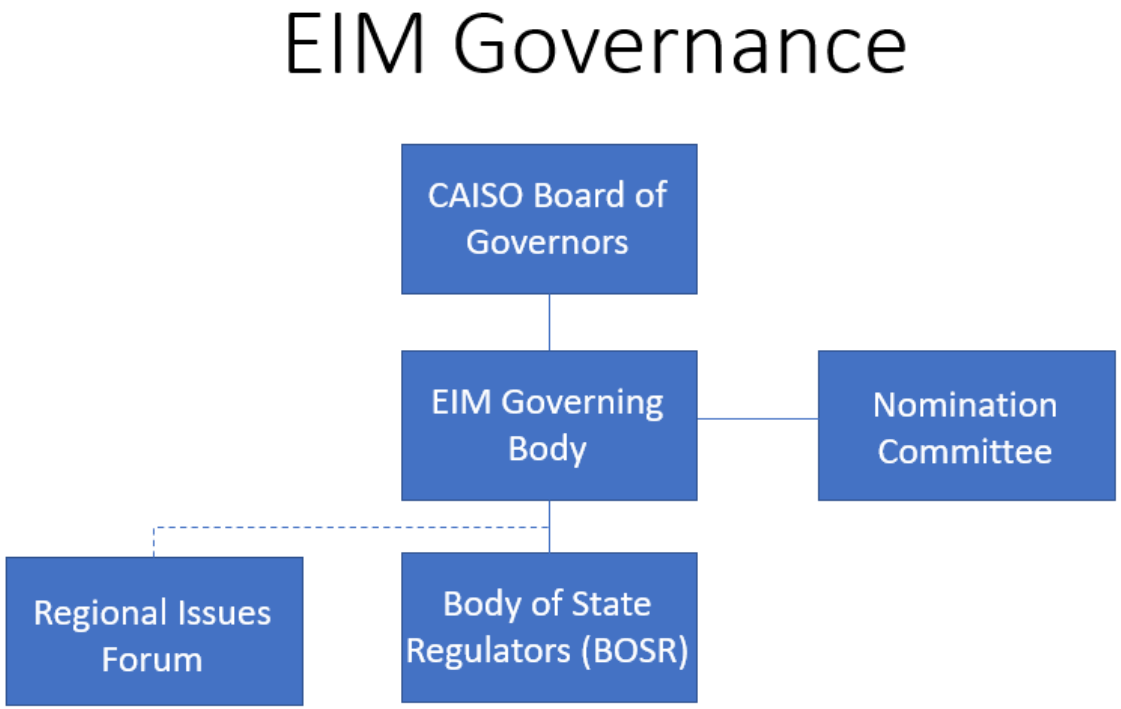
CAISO Statutes and Governance Challenges

- CAISO founded as a California benefit corporation – for the benefit of California rate payers.
- CAISO Board of Governors
  - Appointed by CA gov.
  - Can delegate authority, but must be able to revoke that delegation.
  - *Final decision on CAISO markets will always rest with CAISO Board of Governors under current law.*



CAISO Wheeling Proposal

- In response to the rolling outages that occurred last summer, CAISO developed a suite of changes to their market.
- One of the proposed changes fundamentally changed the ability to rely on CAISO's transmission system to both wheel across the CAISO transmission system (PNW sales/purchases with DSW) and export from CAISO.
- The proposal created significant concerns across WECC because it limited regional trade, departed from norms of transmission access and highly limits regions ability to rely on extra-regional supply, particularly during short term heat events or unit outage events. This impacts BPA as ***seller and a purchaser***.
- CAISO's proposal, FERC docket ER21-1790, was protested by entities all across WECC including Investor Owned Utilities, PPC, BPA, Powerex and regulators.

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CAISO Wheeling Proposal

- FERC sided w/CAISO on all counts & approved proposal on the merits, which could become baseline for long-term CAISO policy
- Despite long history of CAISO currying favor with FERC, ruling was surprising and caused strong reactions, implicating CAISO's regionalization efforts. Chairwoman of ACC:

> "While I sympathize with those in California who experienced rolling blackouts last year, I stand firm with Arizonans first and believe that California's manipulation of the market is unfair and unjust to Arizonans and other states in the West."
>
> "We need strong regulators who are willing to stand up for Arizona's interests in the West. As a commissioner, I must question how potentially expanding our participation in the regional market will benefit Arizonans, if the energy market will not be governed fairly and independently."

- CAISO next steps and why and why it matters

PPC staff takeaway

FERC, courts, or even governance may not prevent inequitable market policy changes. We should focus on advocating for fundamental market designs that emphasize efficiency, transparency, fairness, creating appropriate incentives and designs that do not favor one set of resources or loads above others.

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EIM Deep Dive & BPA Participation

What is the Energy Imbalance Market?

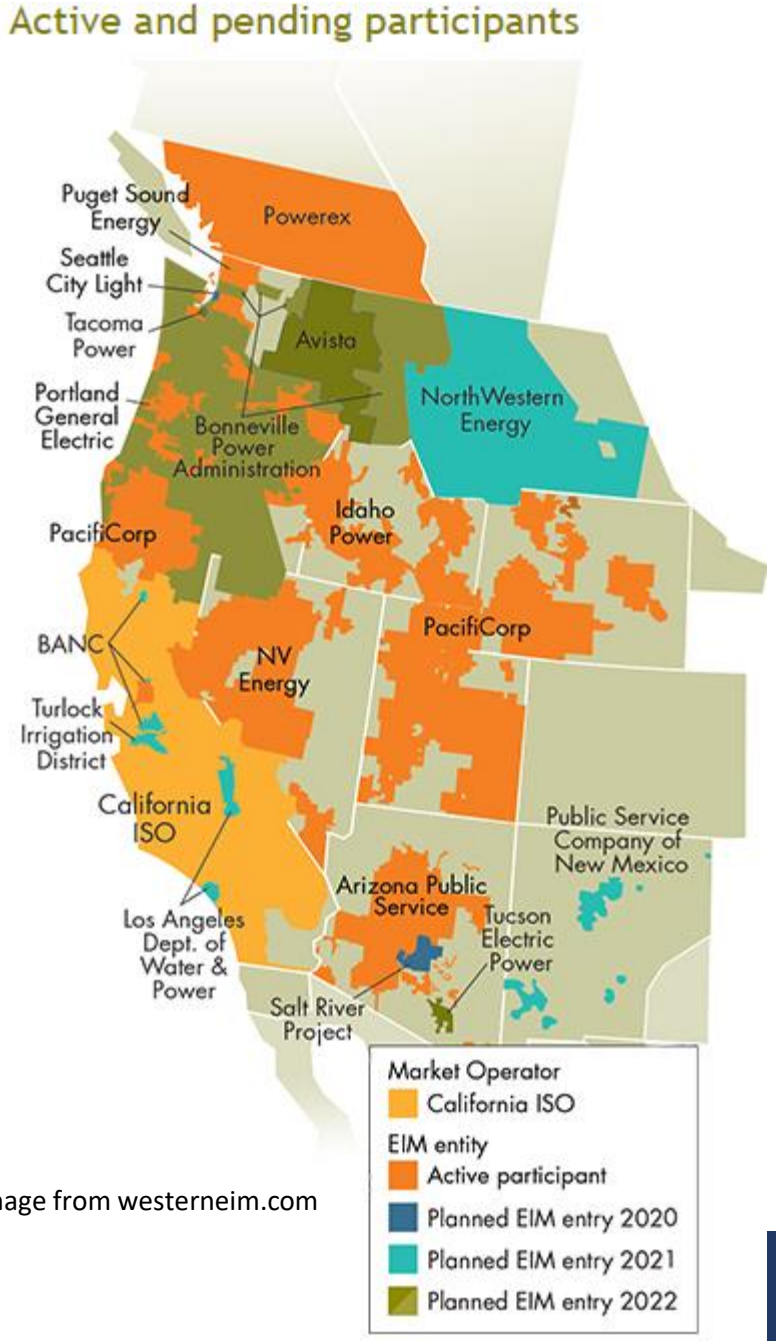

Image from westerneim.com

- Extends CAISO real-time market operations into other BAAs.
- Optimizes dispatch in real-time across the EIM footprint based on *bids of resources available in real time. (Units available to generate more or less in the next hour).*
  - Each EIM Entity starts with a base schedule and bid curve for their resources.
  - The bid curve conveys the cost of generating at various outputs.
    - If energy is available at a lower price, then entity will purchase energy from the market to meet real-time needs.
    - If others are serving load with higher cost generation, that generation will be reduced, and the less expensive generator will be dispatched – selling to the market.
- Regional benefits are created through lowering the total cost of regional dispatch required to meet load.
  - Allocation of regional benefits determined by market design and price formation.
  - Not all entities will benefit equally
- Participation is voluntary.

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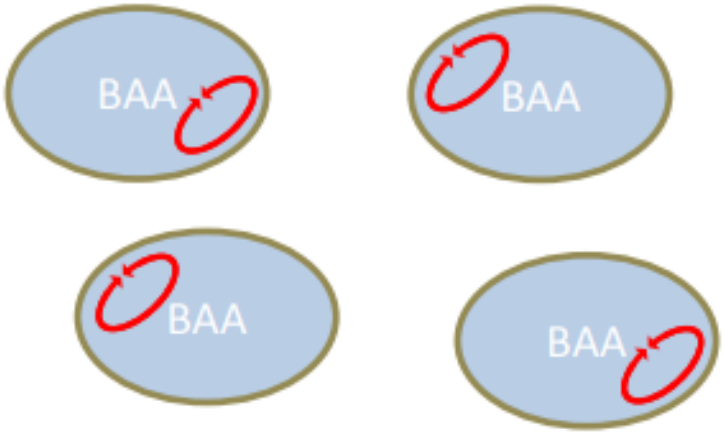
How does the EIM create benefits?

Without EIM:
Each BA must balance loads and resources within its borders.



With EIM:
The market dispatches resources across BAAs to balance demand

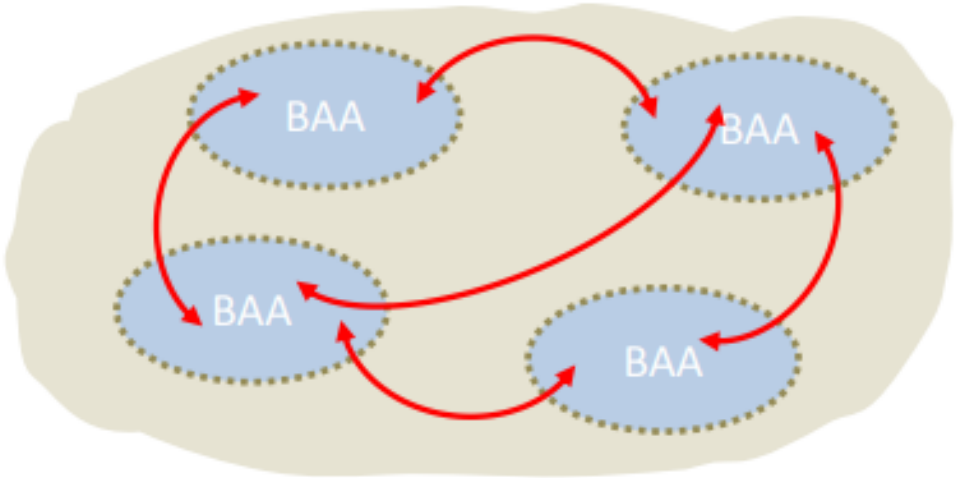


Image from BPA's EIM 101

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What does participation in the EIM look like?

EIM Entity

Participating Resource

Non-participating Resource

Load

What about BPA's participation?

BONNEVILLE POWER ADMINISTRATION

Image from bpa.gov

Why Participate?

- More efficient dispatch of FCRPS expected to increase secondary revenues. These revenues are used to reduce power rates.
- More efficient dispatch of resources in the Balancing Area could reduce transmission congestion and address modest capacity deficits on the transmission system without new builds.

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Potential Impacts to Power Rates

- BPA business case identified $29-$34M in net benefits annually.
- BP-22 proposed rates assume $0 net benefits for Power Services' EIM participation.
  - PPC filed testimony arguing for a higher recognition of benefit in BP-22, using a discounted version of the BPA business case.
  - BPA staff was not responsive to this recommendation.
- Currently no identified method for quantifying/estimating benefits of EIM participation and reflecting those benefits through lower power rates.

Preference

FERC Jurisdiction

Sound Business Principles

Existing Contracts

Autonomy

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What About Governance?

CAISO Board of Governors	EIM Governing Body
Provided ultimate decision-making authority through California statue.	Delegated authority from the CAISO Board of Governors through Governing Body charter. Charter is modified through approval by CAISO Board of Governors.
Members appointed by California Governor & reflect California interests.	Members nominated by stakeholder committee and confirmed by EIM Governing Body. Intended to reflect the diversity of EIM participants and stakeholders.
As political appointees have a range of background with varying levels of utility experience.	Candidates identified through recruitment process and have strong industry experience.

Current proposal to establish Joint Authority between these bodies for all rules that apply to EIM Entities.

PPC Response to BPA EIM Closeout

- Developed a “risk mitigation package” to address specific concerns identified by PPC members.
  - Transparency & Reporting
  - Accountability
  - Long-term Strategy Development
  - Benefits in Power Rates

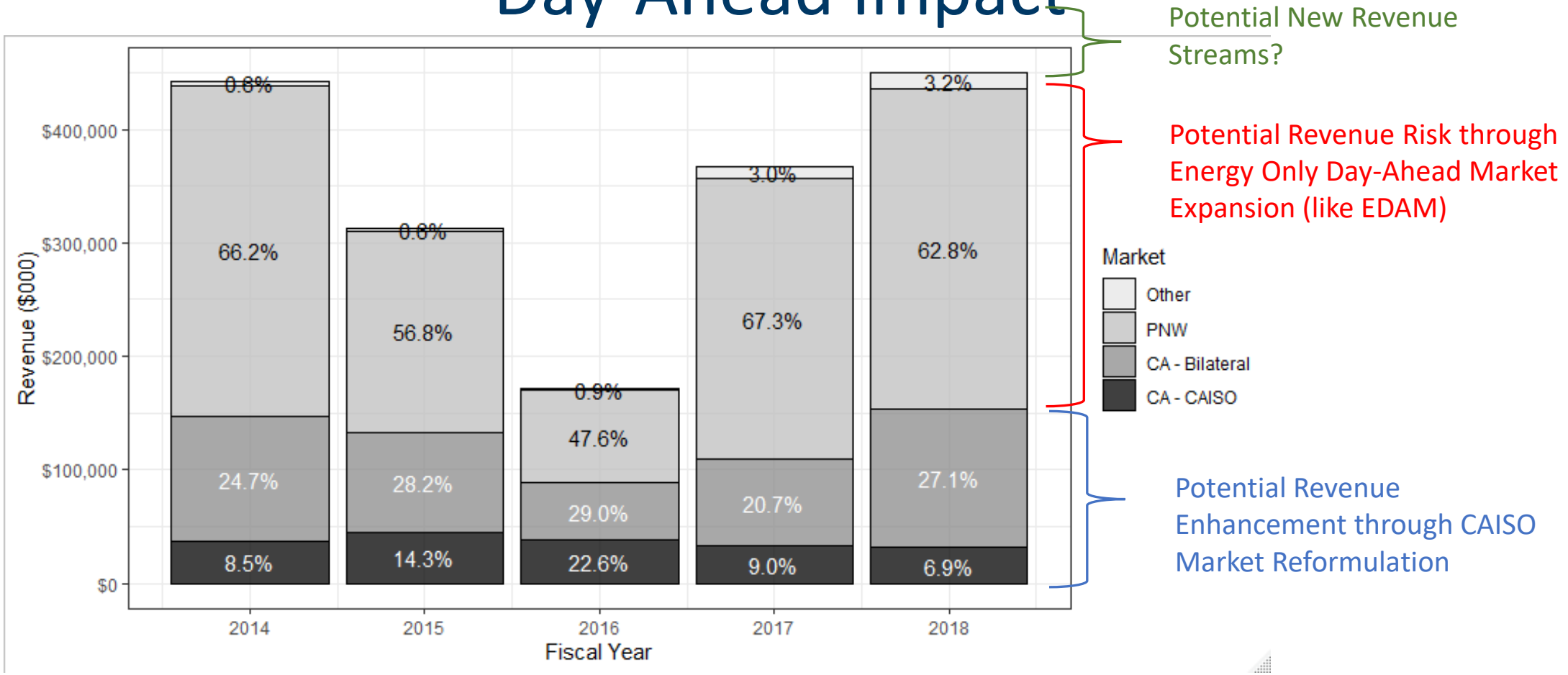
Potential Future Expansions of Organized Markets in the West

Real-Time	Day-Ahead	RTO
• Optimizes dispatch of resources available in real-time. • Principally used to balance within hour deviations in renewable output and load. • Limited scope = limited risk and limited benefit.	• Optimizes dispatch of resources day-ahead by changing planned unit commitments. • Changes prices in day-ahead, and has greater impacts than real-time dispatch & pricing. • Price formation becomes critical to ensure reliable operations and proper compensation to generators for attributes provided. • Accounting for firmness and flexibility of resources. • Transmission use and compensation for that use becomes more complicated.	• "Full service" organized market. • Centralizes nearly all functions of operating and planning for the regional transmission system. • Balancing areas are consolidated, and footprint operated as single system. • Participation is no longer optional. • RTO assumes responsibility for reliability and compliance. • Resource Adequacy is usually operated as part of a larger RTO market.
CAISO EIM SPP WEIS	CAISO EDAM? SPP Markets+?	CAISO, MISO, NE ISO, SPP Grid West/Indigo – previous NW attempts

Day-Ahead Much Larger Impact Than EIM

- Previous slide shows that potential impacts on BPA rates are much greater under a Day-Ahead Market (or RTO) than EIM.
- Formation of day-ahead market would require additional scrutiny of market design and governance.
- PPC collaborating with other entities on day-ahead market design analysis.
  - Expected late summer/early fall.
  - Will indicate high priority design issues with the greatest potential impact to BPA/PPC members.

BPA Secondary Sales – Potential Day-Ahead Impact



Source: FERC EQR

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Intro to Regional Electricity Markets & BPA Impacts

Questions?

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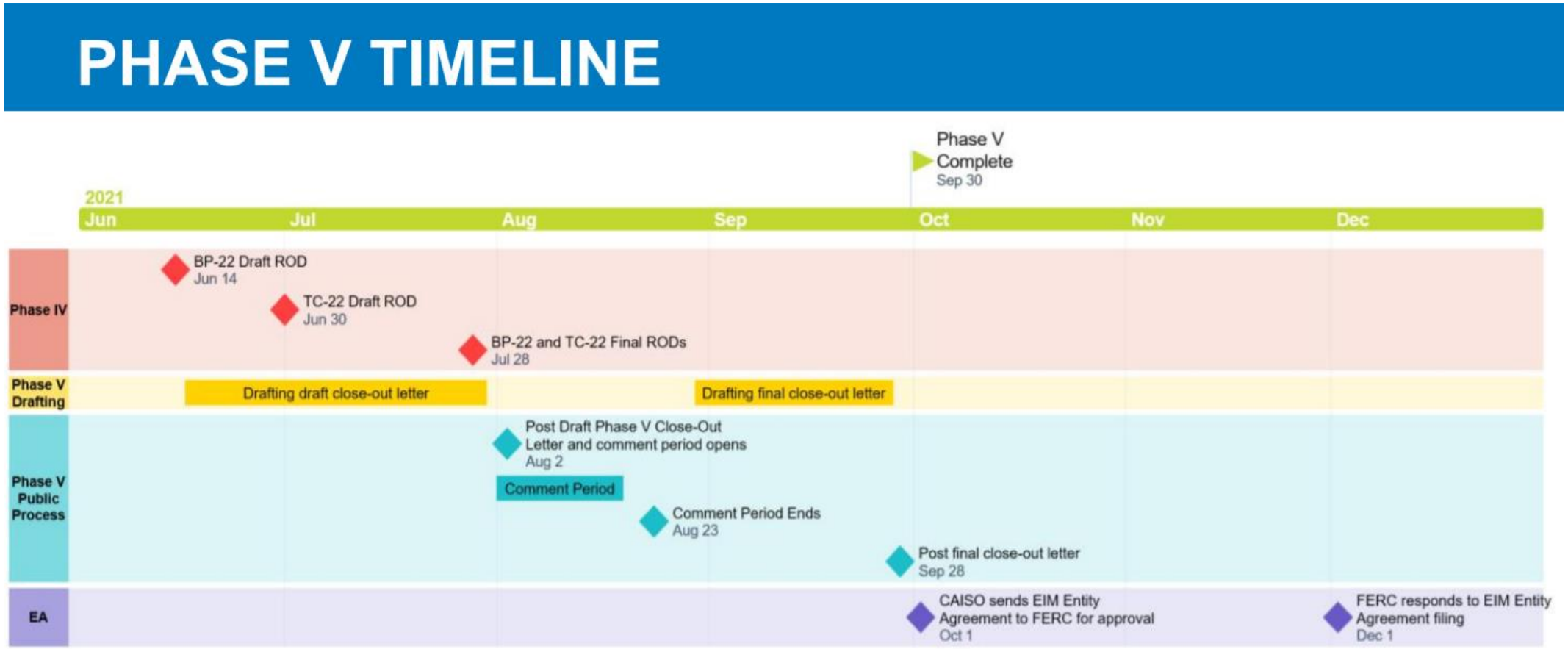
Market Info Appendix

Types of Organized Markets

- Energy Market
  - Auctions used to coordinate the production of electricity on a day-to-day basis. In an energy market, electric suppliers offer to sell the electricity that their resources generate for a particular bid price, while load-serving entities (the demand side) bid for that electricity in order to meet their customers' energy demand. RTOs typically run two energy markets: the day-ahead and real-time markets.
- Capacity Market
  - NERC requires retailers to support enough generating capacity to meet forecasted load plus a reserve margin to maintain grid reliability. This market uses an auction to procure a level of future capacity deemed necessary for grid reliability.
- Ancillary Services Market
  - Uses short-term supply and demand to form prices that reflect the location-based marginal value of specific energy services.

Next Steps on BPA EIM Participation



PPC Staff will be asking for guidance on PPC's position at August Executive Committee Meeting

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Range of Feedback on BPA EIM Participation - PPC Members & Market Development Committee

Full Range of Perspectives on BPA's EIM Decision:

- BPA must stop considering EIM participation.
- BPA should allow more time to make its decision on EIM participation.
- BPA must go forward as planned with EIM participation.

Some Consistent Themes:

- Concern that there will be a lack of transparency and accountability related to BPA's participation.
- Concern that BPA has failed to develop or put forward any realistic metrics that it will use to measure its participation.
- Skepticism that BPA will adequately reflect expected EIM benefits in future grate cases to lower Power rates and concern that BPA has failed to develop any mechanisms for the equitable accounting of benefits and risks in rates.
- Interest in ensuring that BPA retains the flexibility to explore other market options should they become available.