WESTERN ENERGY MARKETS

Price Formation Enhancements – MPM and Scarcity Pricing

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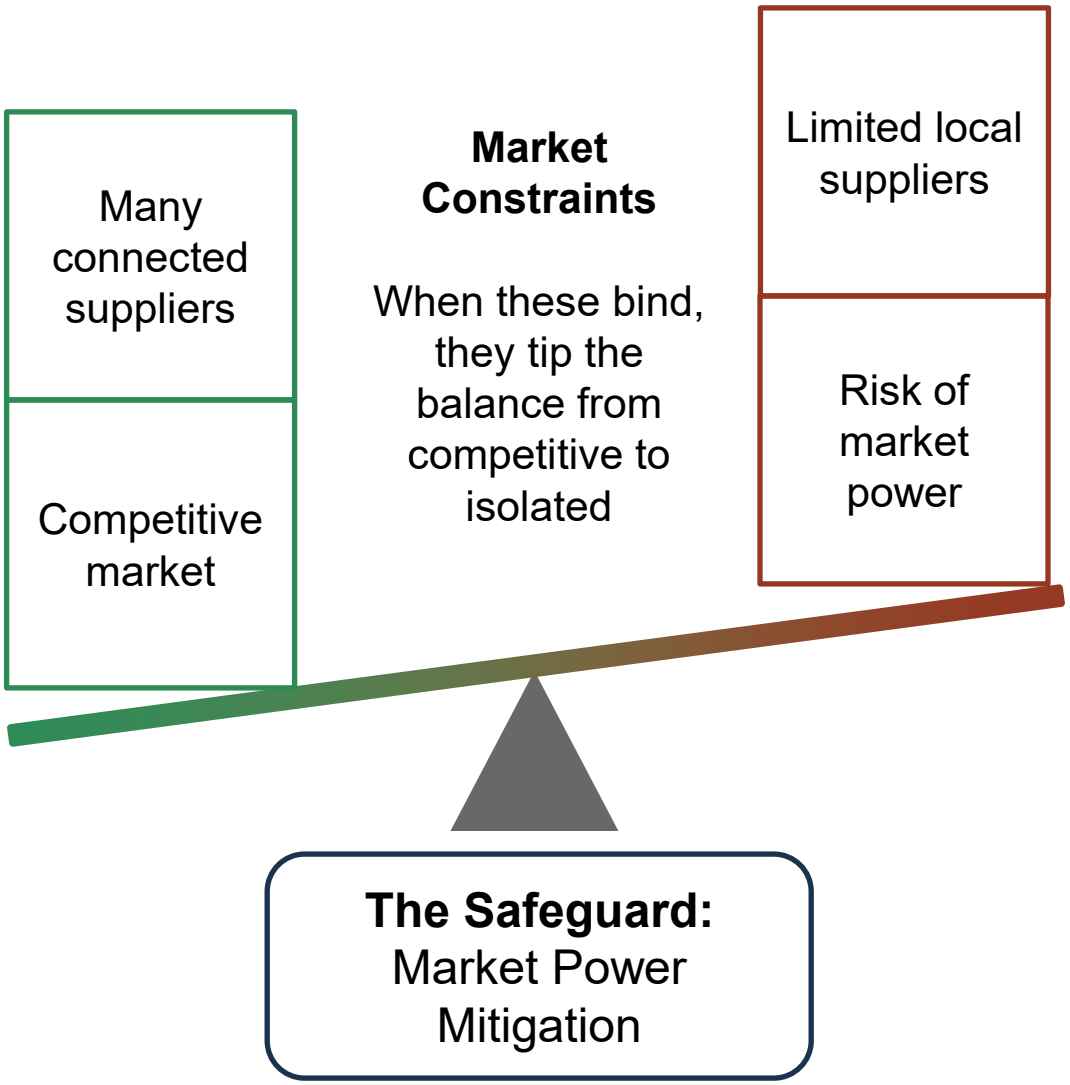
Agenda and Objective

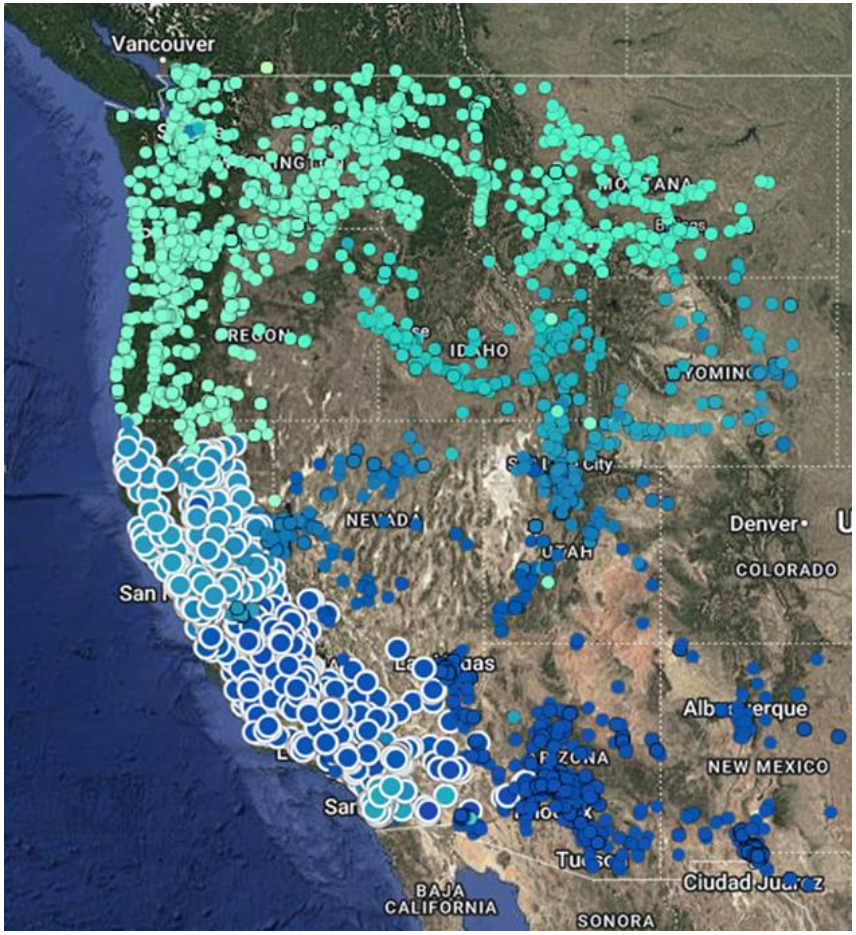
Objective: Provide foundational knowledge for future policy discussions.

1. **Balancing Authority Area (BAA)-Level Market Power Mitigation (MPM)**
   a) What problem does it solve?
   b) How does it work at a high level?
   c) Key insights
2. **Scarcity Pricing**
   a) What is it and why is it important?
   b) How does it function in our market?
   c) What policy questions is the ISO working on with stakeholders?
3. **The Interplay**
4. **Looking Ahead**

The core problem market power mitigation addresses



What is BAA-level market power mitigation?



Each dot represents a pricing node with the color scale indicating the price level.

Local MPM addresses congestion *within* a BAA.

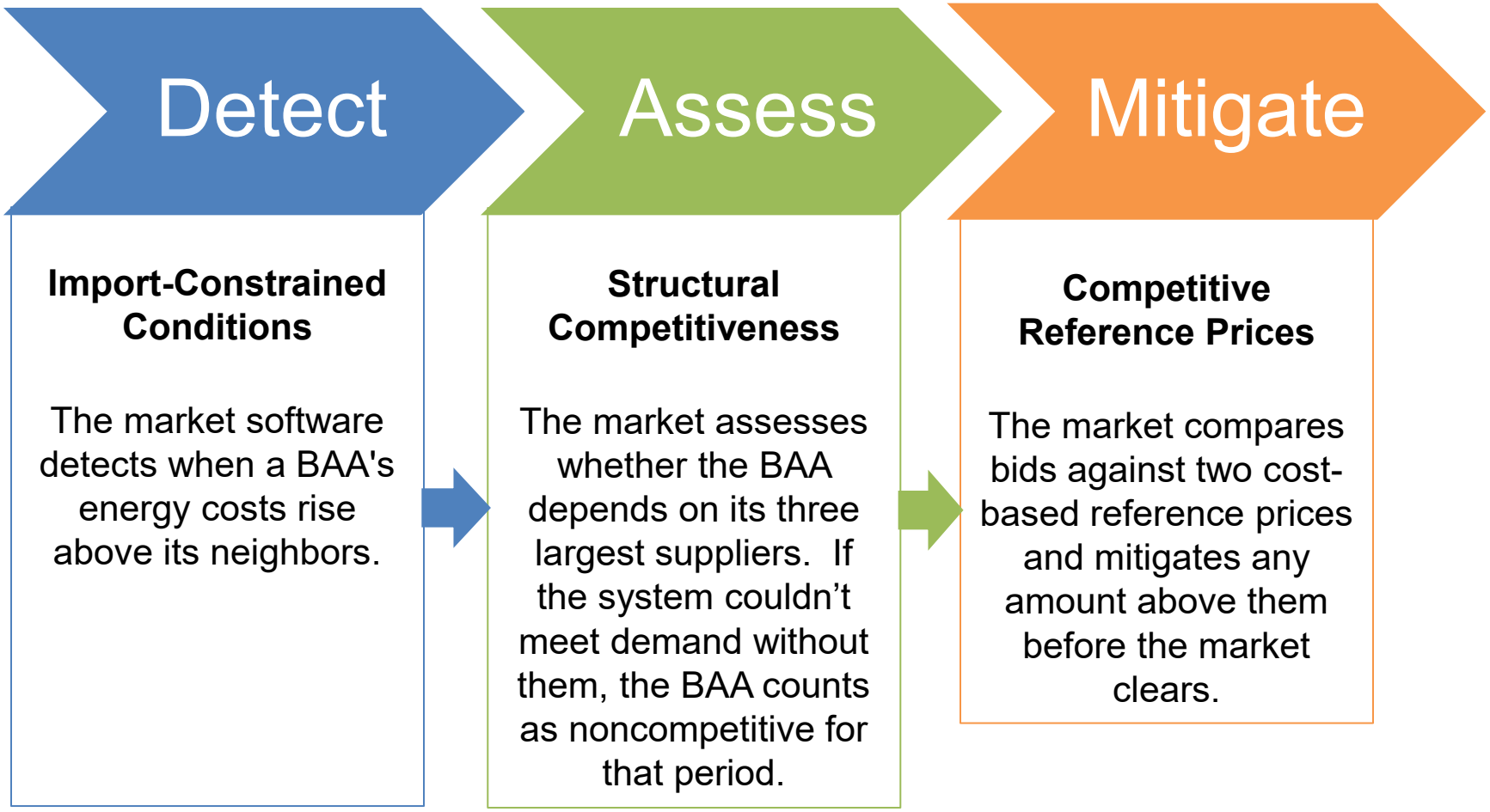
- Binding transmission constraints

BAA-Level MPM addresses congestion *between* BAAs.

Market regions isolate when transfer constraints bind.

These regions can no longer import cheaper energy and depend on a smaller number of suppliers.

How BAA-level MPM works



Market power mitigation policy changes currently under consideration

Shift to Grouping Approach

- Test connected BAAs together

Include CAISO BAA in Test

- Treat CAISO like any other BAA

Mitigate only Pivotal Suppliers

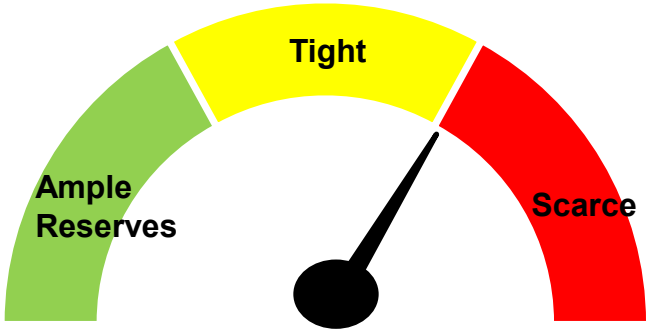
- Avoid mitigation of fringe participants

Incorporate Net Position

- Account for supplier's load-serving obligations

Together these changes reduce unnecessary mitigation, apply market power rules consistently, and better reflect incentives to exercise market power.

What is scarcity?



Scarcity happens when the grid is low on reserves.

- **Normal Conditions:** Ample generation is available to serve load and maintain reserves. Prices are set by the cost of the last generator needed.
- **Scarce Conditions:** The system struggles to meet both energy needs *and* reserve requirements.
  - Every megawatt of capacity has a greater impact on maintaining reliability.
  - The risk of a shortfall or emergency action (like shedding load) increases.

Theory of scarcity pricing

Scarcity pricing lets the market reflect the reliability value of reserves when resources are scarce.

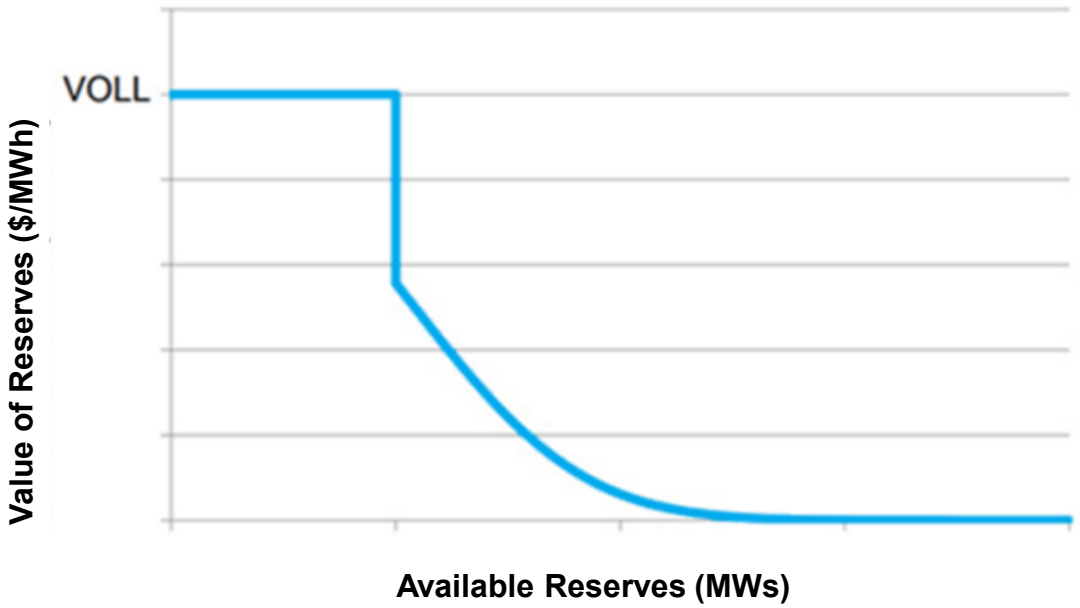


Chart adapted from ERCOT.
VOLL = Value of Lost Load; the estimated cost to society of a grid outage.

Why scarcity pricing improves reliability

Scarcity pricing sends a powerful economic signal that unlocks all possible resources to protect the grid.

- **Incentivizes more supply:**
  - Encourages all available generation to come online, offer to the market, and produce at maximum output.
  - Signals to resources in neighboring BAAs to export energy – alleviating risks in scarce areas.
  - Directs EDAM / WEIM transfers to the most urgent locations.
- **Incentivizes demand reduction:**
  - Signals battery storage to discharge and large consumers, flexible loads, demand response programs, and exports to curtail.
- **Long-term investment signal:**
  - Supports investment in resources needed for future reliability.

Policy questions under stakeholder consideration

- What is the correct price of reliability?
  - Value of lost load (VOLL)?
  - Is VOLL homogenous across a broad geographic footprint
- How does scarcity pricing work in a voluntary market?
  - No common resource adequacy or capacity paradigm
  - Base schedules and available balancing capacity may mute scarcity pricing signal
- How would scarcity pricing changes impact the bilateral framework in the broader western interconnection?

Scarcity pricing policy changes currently under consideration

Preserve Scarcity Signals

- Reflect opportunity cost of using capacity from contingency reserves in 5-minute market

Trigger Scarcity Pricing for Load Shedding Events

- Activate highest market prices when operators shed load

Comprehensive Scarcity Pricing Design

- Significant redesign of market to ensure that prices predictably rise to extra margin levels during scarce system conditions
  - New product procured under a demand curve
  - Latent supply price adder

The first two identified changes reflect immediate straightforward modifications that improve the pricing regardless of if comprehensive scarcity pricing is perused in 2026

The interplay

A central challenge for market design is to distinguish scarcity from market power.

	Scarcity Pricing	Market Power Mitigation
Problem	A genuine system-wide shortage of available capacity.	An artificial shortage in a constrained area due to uncompetitive bidding.
Goal	Allow prices to reflect the true value of reliability.	Prevent uncompetitive prices due to market power.
Outcome	Legitimate high prices protect the grid.	Uncompetitive high prices are mitigated.

Conclusion and looking ahead

Key takeaways

- **BAA-level MPM** targets market power in situations where BAAs become isolated.
- **Scarcity pricing** uses price signals to manage tight system conditions.

Looking ahead

- The market environment is evolving rapidly as regional markets expand.
- Through the **Price formation enhancements** initiative, ISO staff is actively working with stakeholders to review and refine these mechanisms to ensure they remain effective.
- We will bring formal policy proposals to the WEM Governing Body (primary authority) and ISO Board of Governors (consent agenda) for consideration in 2026.

The BOSR can offer important perspectives to inform these design features as both topics are fundamental to the spread of well functioning electricity markets throughout the west.