



# Real-time pricing analysis discussion

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General Session  
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# Background

- Ongoing concerns expressed in different forums about price divergence and prices not reflecting system conditions
- More recent concerns about pricing arose during discussion in the intertie deviation settlements initiative
- The ISO committed to start a more formal analysis effort with input from stakeholders and the Market Surveillance Committee.

# ISO Markets

## Transmission-Right Markets

CRR allocation

CRR auction

Market Power Mitigation

## Day Ahead Market

Integrated Forward Market

Reliability Unit Commitment

## Real-Time (EIM) Market

Fifteen Minute Market

Real-Time Dispatch

Monthly, seasonal and TOU intervals

Congestion Revenue Rights  
(Obligations )

Hourly intervals

Energy

- a) physical
- b) virtual

Mileage

Capacity

- a) Reliability
- b) Ancillary services
  - Spinning
  - Non Spinning
  - Regulation

15- and 5-minute intervals

Energy

Flex Ramp

Mileage

Capacity

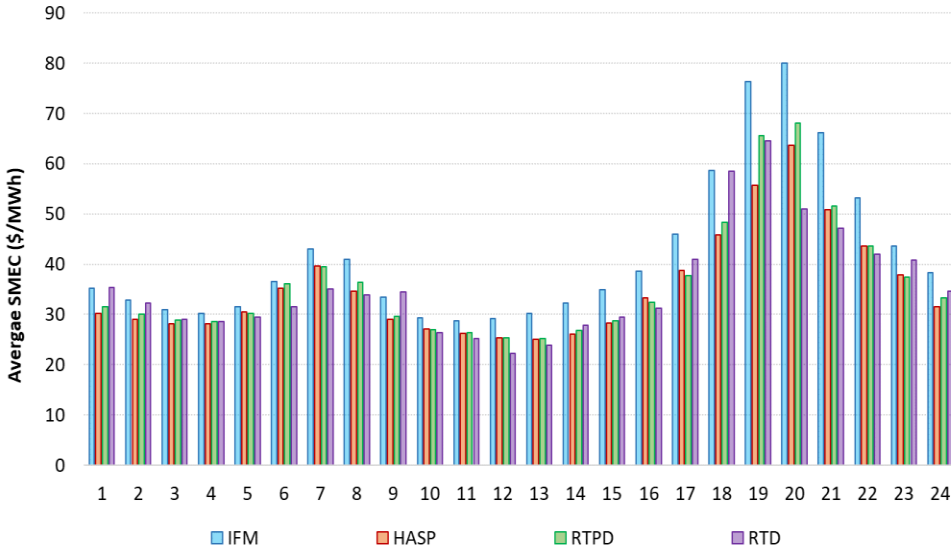
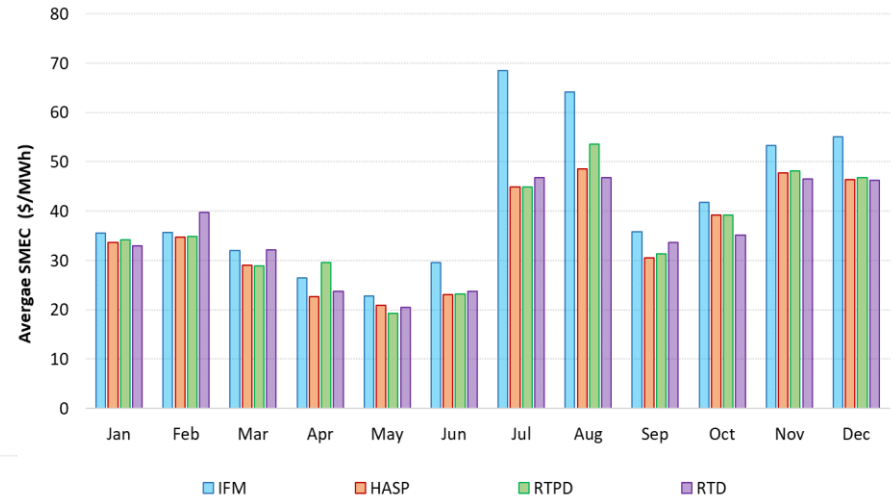
- Spinning
- Non Spinning
- Regulation

# ISO markets

- Multi-step settlements can create opportunities and incentives. HASP clears schedules, but FMM sets the binding prices.
- Look-out horizons of different markets may create natural misalignments
- Changes between markets may lead to differences of conditions to clear the markets

# Price convergence across markets can serve as an indicator of price performance

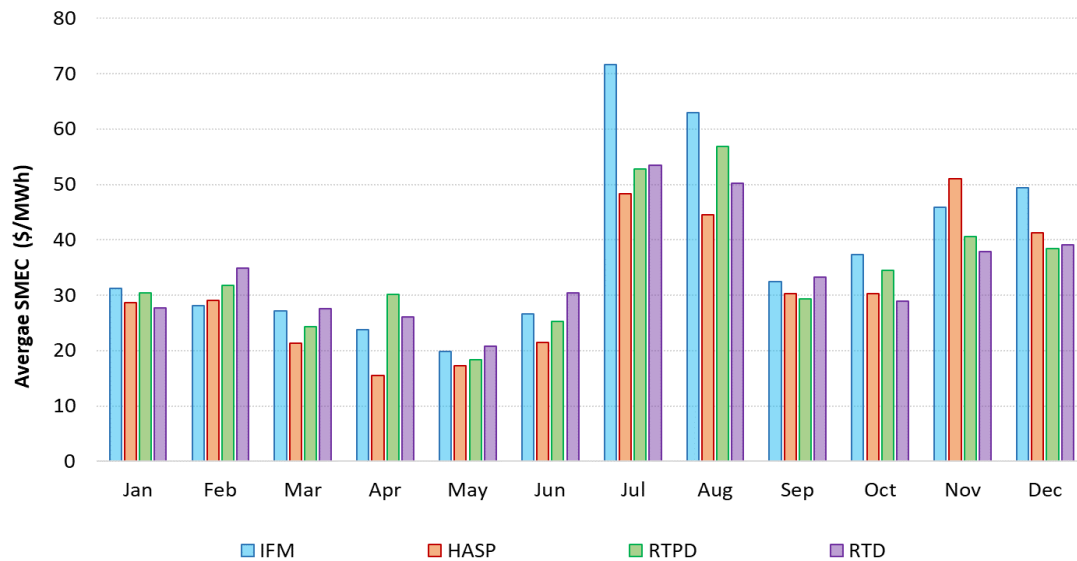
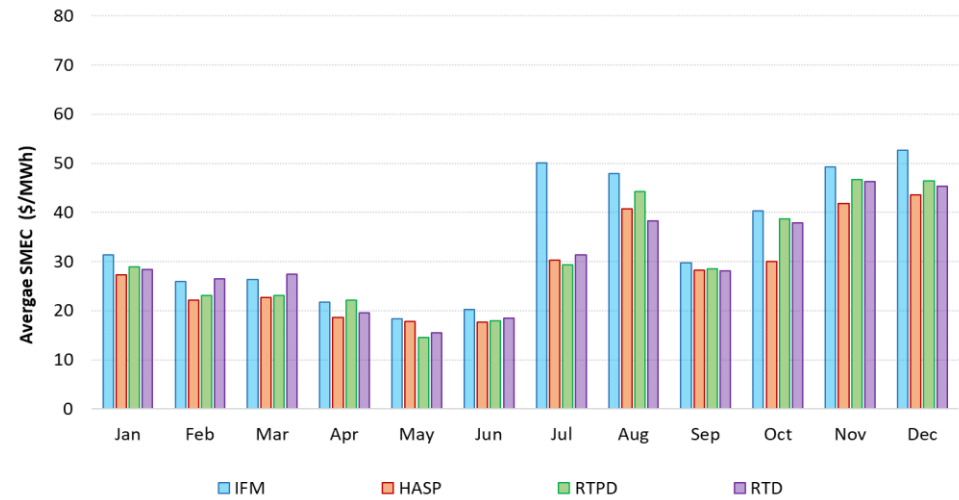
Monthly simple average based on system energy price



Hourly simple average based on system energy price

# Analysis of price performance on interties needs to be more targeted

## Malin Intertie



## Paloverde Intertie

## Basis for market clearing prices

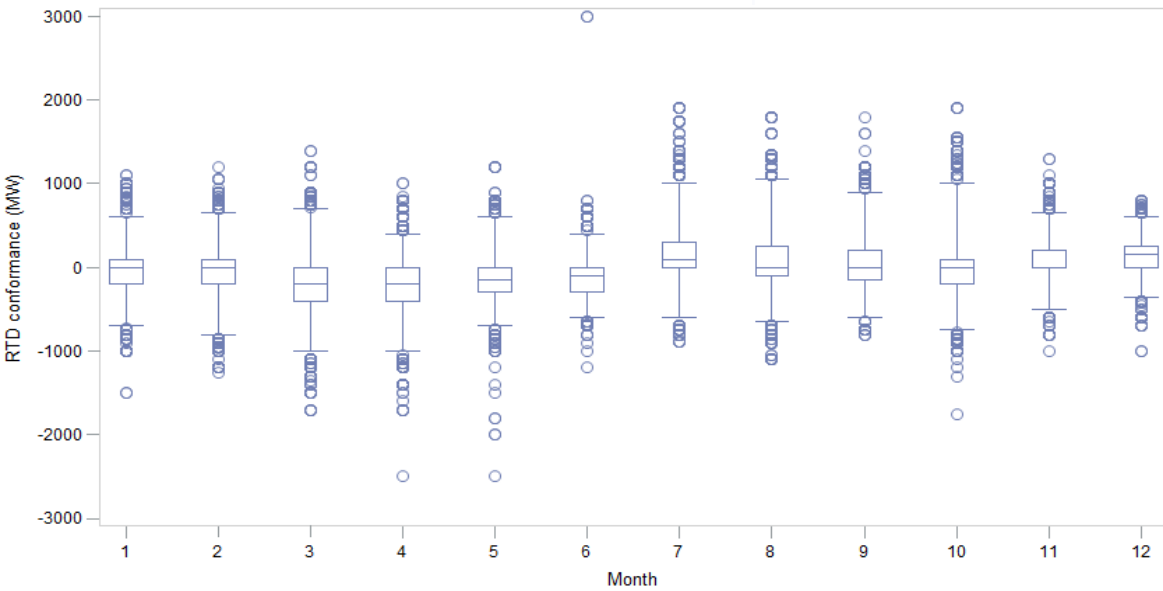
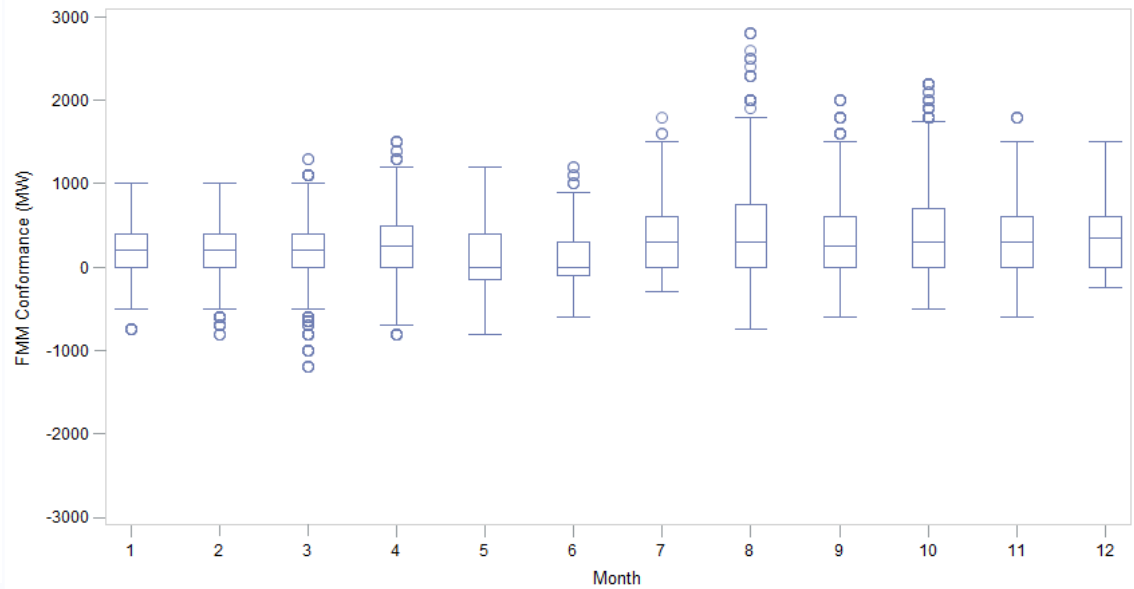
- Both supply and demand are factors to set the market clearing prices
- The Demand side used to clear the markets include:
  - Load forecast (bid-in demand in IFM)
  - Exports, pumps
  - Operators' adjustments (not in IFM)
  - Convergence bids (only IFM)
  - System losses

# Operators may take actions to align the market with current and expected conditions

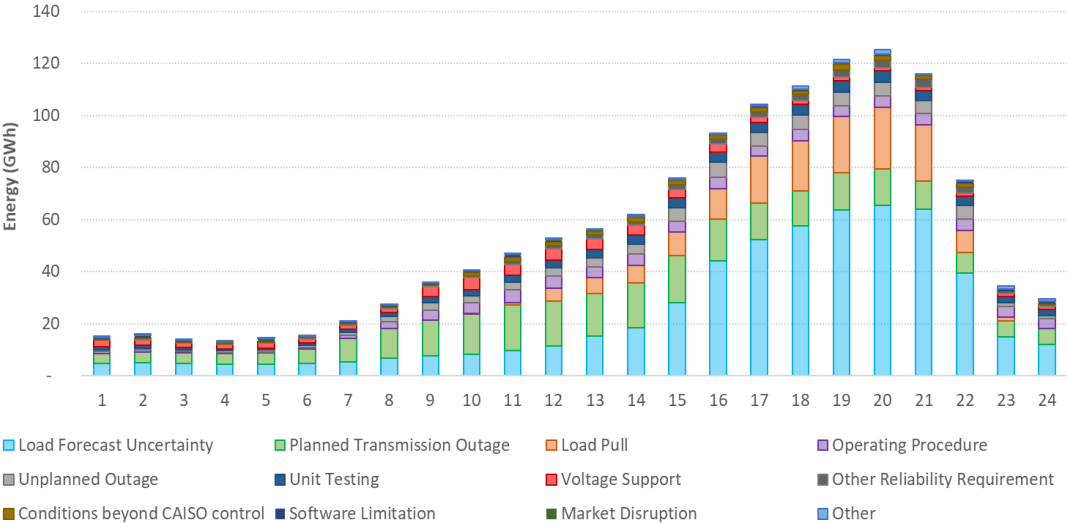
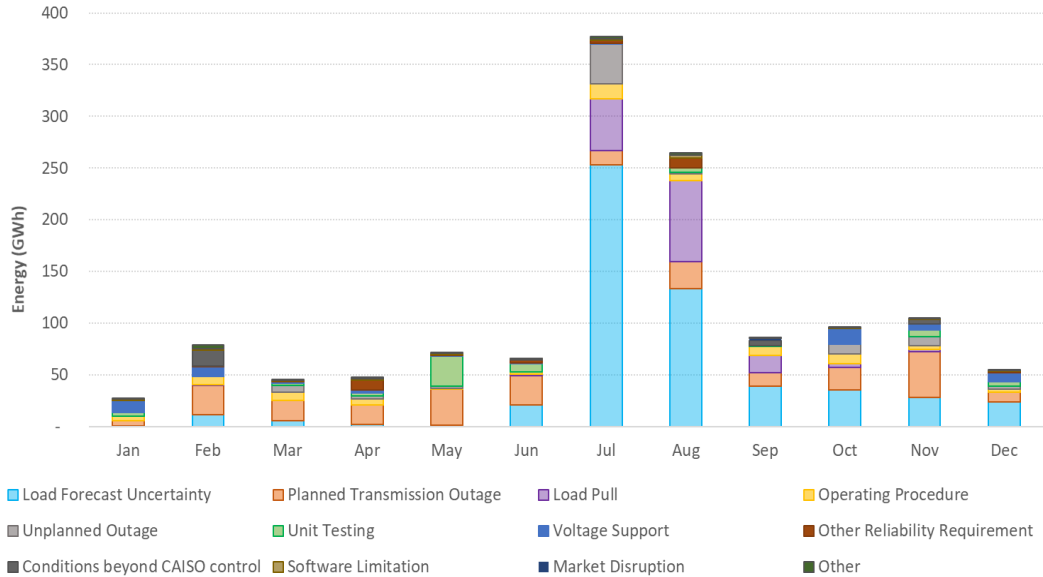
- Demand side
  - RUC net short
  - Load conformance imbalance
- Supply side
  - Exceptional dispatches
  - Manual dispatch of interties
  - Blocking of instructions (commitments, transitions, ties, DOTs)



Load conformance increases/decreases market requirement cleared in the market



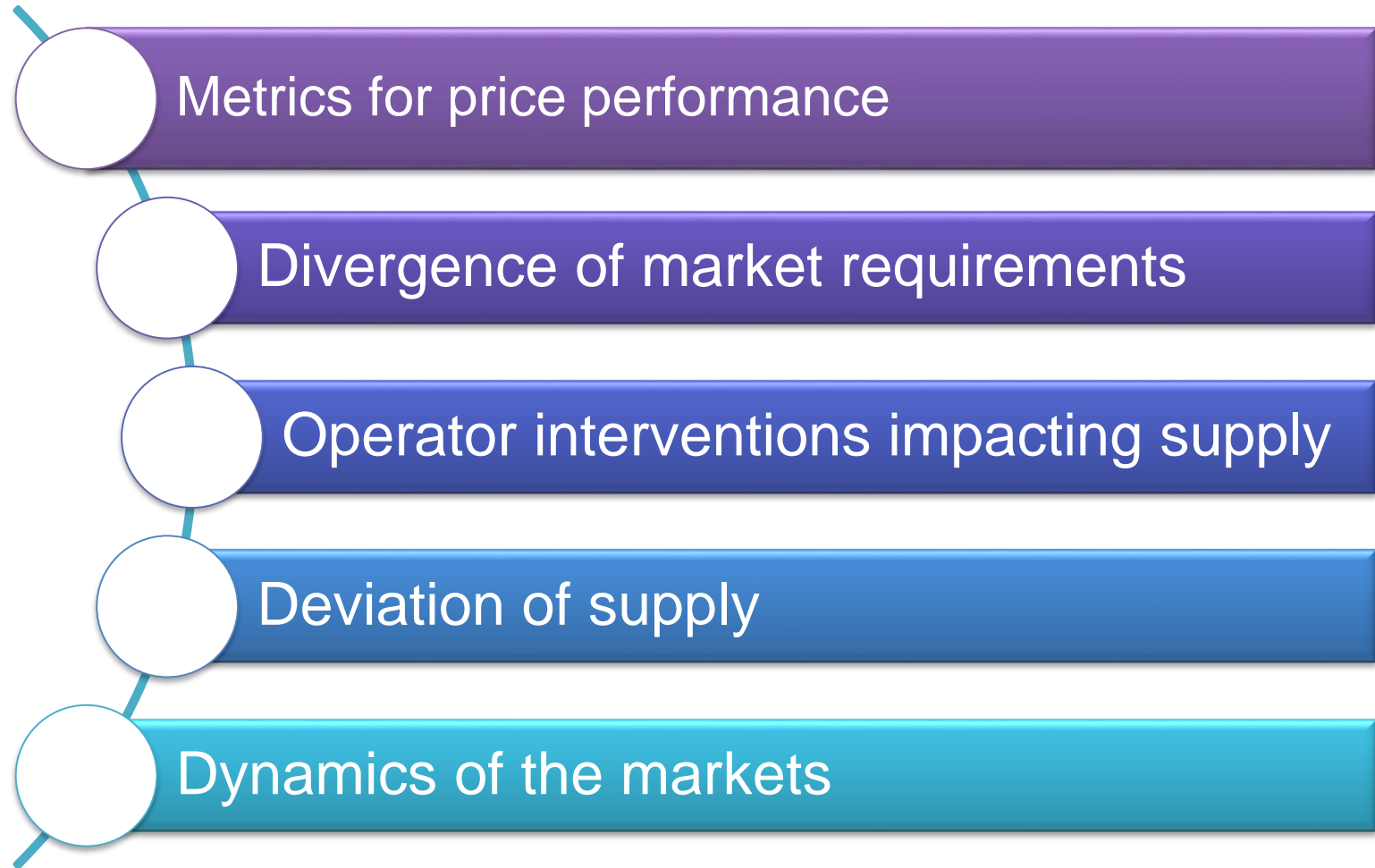
# Exceptional dispatches and manual dispatch of interties add supply to the real-time market



# Certain market dynamics and features can impact the supply available in the markets and create a vicious cycle of market interventions

- Variable energy resources treatment and forecasting
- Resource deviations
  - internal resources
  - Interties
  - VERs
- Energy imbalance transfers
- Convergence bids
- Non-market changes
- Load forecast accuracy

# Items proposed for analysis



# Proposed timeline for stakeholder engagement and analysis

Task	Schedule
Draft proposal for analysis	Wednesday April 3, 2019
Discussion at MSC meeting	Friday April 5, 2019
Stakeholder call	Wednesday April 10, 2019
Stakeholder comments	Wednesday April 17, 2019
Posting of first report	Thursday June 14, 2019
Stakeholder call	Thursday June 21, 2019
Final report	Wednesday July 31, 2019
Stakeholder call	Wednesday August 7, 2019