EIM Mitigation

EIM Offer Rules Workshop
July 19, 2018

Brittany Dean and Gabe Murtaugh
Market and Infrastructure Policy

Working Group Objectives

- Scope upcoming EIM Mitigation initiative
  - Agree on issue(s) to be solved
- Based on discussion, CAISO will move forward with a Straw Proposal

Agenda

Time	Topic	Presenter
1:00 – 1:15 pm	EIM mitigation background	Brittany Dean
1:15 – 1:35 pm	Department of Market Monitoring	Eric Hildebrandt
1:35 – 2:05 pm	Powerex	Mark Holman
2:05 – 3:15 pm	Mitigation issues Review CCDEBE policy ISO DEB analysis	Gabe Murtaugh Brittany Dean Gabe Murtaugh
3:15 – 3:55 pm	Discussion of issues	Brittany Dean Gabe Murtaugh
3:55 – 4:00 pm	Next steps	Brittany Dean

EIM MITIGATION

BACKGROUND

Brittany Dean
Market Design Policy Developer

Stakeholder Comments

- EIM Participants:
  - Current approach fails to accurately capture opportunity costs of hydro resources; discourages EIM participation and potential EIM membership
  - Formulaic approach to calculate marginal costs of hydro is highly subjective
  - Supports consistent and equal requirements for energy-limited resources in all BAAs capturing opportunity costs in bilateral markets, marginal prices, and variable operating costs
  - Improvements to mitigation
- CAISO Participants
  - EIM resources should not have a different DEB; maintain mitigation consistency

Alternate DEB and related issues have been topics in a number of forums (1 of 3)

- Commitment Cost Enhancements Phase 3 (CCE3)
  - Improved market participants ability to accurately reflect opportunity costs for use-limited resources
    - Includes tariff defined methodology for energy opportunity costs adder
- Commitment Cost Default Energy Bid Enhancements (CCDEBE)
  - Recognizes ISO calculated bid reference levels aren't always correct
    - Introduced reference level adjustment requests
      - Provisions for market participants to request DEB revision before market run

Alternate DEB and related issues have been topics in a number of forums (2 of 3)

- Powerex Limited CAISO Tariff Waiver
  - Addressed unintended consequences of bid mitigation
    - Identified market power at import direction causes Powerex import flows to reverse causing exports to be dispatched at mitigated prices
    - Proposed 2 elements
      - Not use FMM mitigated price for all market applications
      - Not continue to use FMM or RTD mitigated price in subsequent intervals

Alternate DEB and related issues have been explored in a number of forums (3 of 3)

- April 30th EIM Offer Rules Workshop
  - LMPM designs assumes:
    - DEBs accurately reflect supplier's expectations of marginal costs and opportunity costs
    - Suppliers risk recovering all costs not captured in administratively cost calculation
- Regional Issues Forum (RIF)
  - Eastern market power mitigation compared to ISO's framework
    - Conduct and impact test design
    - Reference levels

Issues summary

- Mitigation issues:
  - Flow reversal
  - Appropriate mitigation for one isolated BA
  - Mitigation for balance of hour
  - Competitive LMP frozen for balance of hour
  - Higher threshold before mitigation applied in EIM (i.e. conduct and impact test)
- DEB is too low because it doesn’t accurately reflect marginal costs
  - Opportunity costs are too subjective for formulaic approach

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DMM PRESENTATION

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POWEREX PRESENTATION

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MITIGATION

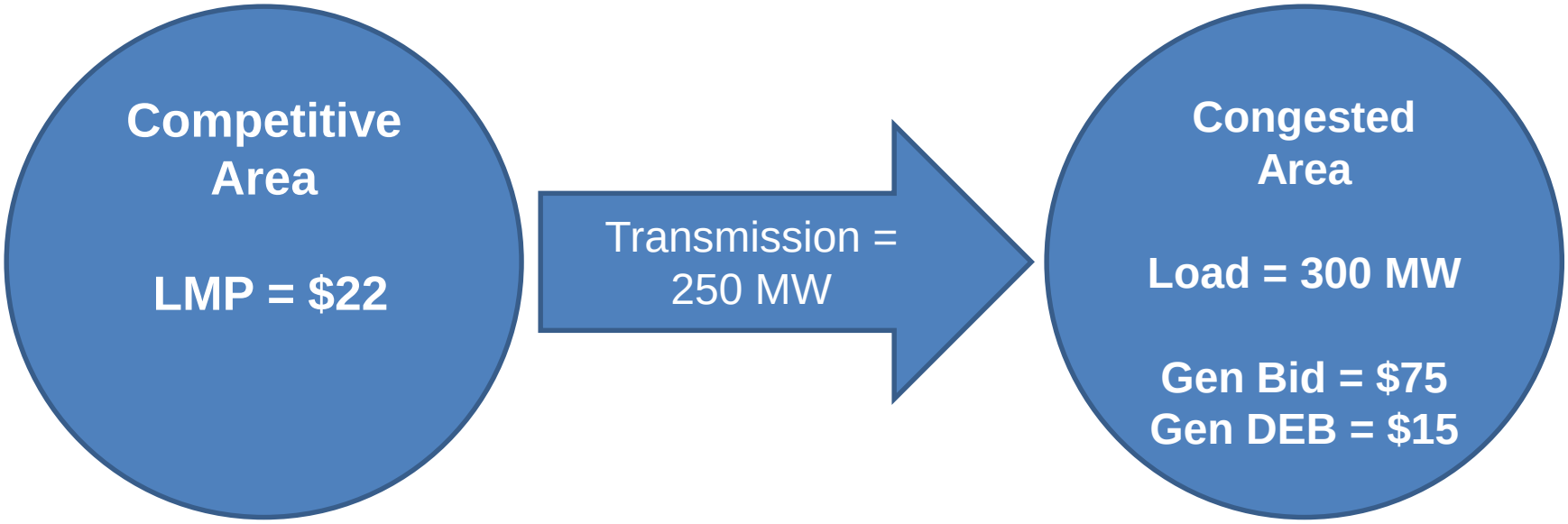
Gabe Murtaugh
Sr. Infrastructure and Regulatory Policy Developer

Market power mitigation is a tool that the ISO uses to prevent the exercise of market power

- When there is no congestion, market generally dispatches supply in price merit order
  - This leads to efficient market outcomes
- Congestion can result in opportunities for resources ‘inside’ of congested areas to arbitrarily increase prices and extract market rents
- The ISO uses market power mitigation to manage intervals when schedulers can influence prices

Example – Hypothetical resource with market power

- Because there is additional load to be served in the congested area the generator can raise bids arbitrarily
- In this example the resource with market power will be mitigated to the competitive LMP = $22/MWh



Potential EIM mitigation issues that CAISO may address through this initiative

1. Remainder of hour application
2. Mitigation for 5-minute intervals, when mitigated during corresponding 15-minute intervals
3. Upper bound on mitigation price for the hour
4. Mitigation measures for BAAs that serve no third-party load
5. Potential different mitigation framework (i.e. conduct and impact test)

Mitigation persists for all remaining intervals in the hour and mitigation prices cannot increase

- Once a resource is mitigated during an hour, it continues to be mitigated for all remaining intervals during the hour
- When a resource is mitigated, mitigated bids are set at maximum of the default energy bid (DEB) or the competitive LMP
  - If the competitive LMP increases in future periods, mitigated bids are not allowed to increase
  - Mitigated bids may be reduced if future competitive LMPs decrease
- When a resource is mitigated in the 15-minute market, the corresponding 5-minute intervals are also mitigated

Any policy measures considered should seek to avoid adverse consequences

- When a resource is mitigated, bids are reduced, which may result in different market outcomes
- Seek to avoid large dispatch increases during one interval, then large decreases during the subsequent interval because of the application of mitigation
- Seek to avoid increasing dispatch in a 15-minute interval, while increasing prices and decreasing dispatch in a corresponding 5-minute interval

Mitigation measures for BAAs where no third party is settled

- Several BAA OATT agreements specify that imbalances are settled at average EIM BAA LMPs
- A resource exercising market power could potentially inflate these settlement prices
- For BAAs that do not have third party load settled on the area's price, there may be no need for mitigation

Conduct and impact test

- Several ISOs, including NYISO and MISO have conduct and impact tests for mitigation
- We may consider implementation of a conduct and impact test
- A conduct threshold frequently used is $100, which means that resources bidding in within this amount of the default energy bid would not be mitigated
  - However, in these models there are also special provisions for areas that have high congestion, where mitigation conduct thresholds are considerably lower
  - These provisions may be applicable to some EIM areas that have frequent congestion

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REVIEW CCDEBE POLICY

Brittany Dean
Market Design Policy Developer

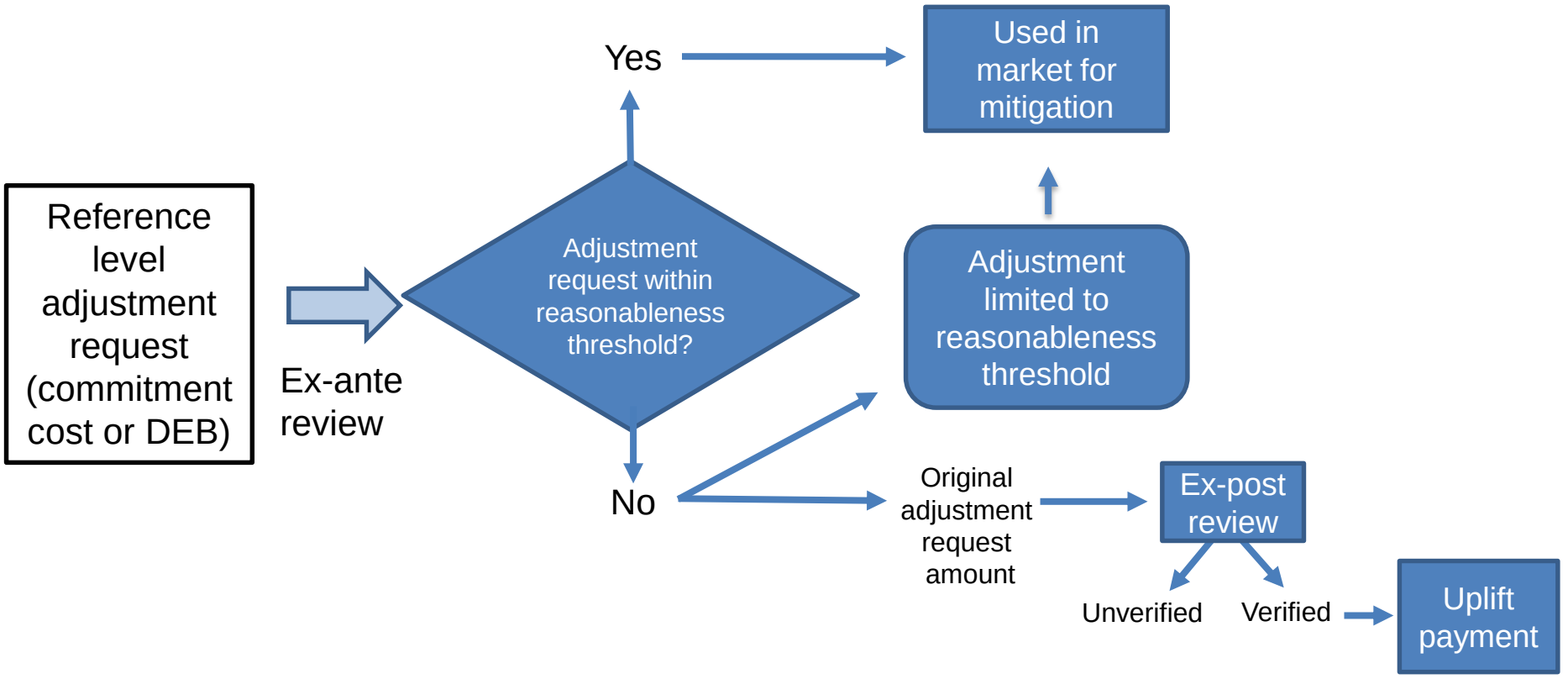
Commitment Cost and Default Energy Bid Enhancements (CCDEBE) enhanced suppliers ability to accurately reflect costs

- Provides for suppliers to request adjustments to reference levels before the market runs
- Provides for after-the-fact recovery of costs that could not be verified before the market runs

Reference level adjustment request

- "Tool" used for suppliers to request adjustments to reference level when their cost estimates differ from the ISOs
  - Adjustment requests must be based on documented costs
- CAISO automatically screens requests against a reasonableness threshold to determine if adjustment amount is used in the market
  - Gas resources = 125% -110% of gas costs depending on the day of the week + other costs
  - Non-gas resources = 110% of fuel equivalent costs + other costs
  - Other costs can include formulaic opportunity cost adder

Reference level adjustment process



Example of default energy bid adjustment request

*** Value unknown to SC***

DEB	Adjustment Request	Reasonableness Threshold**
$25	$35	$40

Adjustment Request	Reasonableness Threshold**
$35	$40
Used in market	Request passed threshold

Request subject to CAISO audit

Example of default energy bid adjustment request

*** Value unknown to SC***

Reference Level	Adjustment Request	Reasonableness Threshold**
$25	$35	$30

Adjustment Request	Reasonableness Threshold**
$35	$30
Ex post review	Used in market

Extra $5 could be recovered

Issues with applicability to hydro resources

- Adjustment level requests– documented costs
  - Currently policy mainly addresses gas costs
- Reasonableness threshold (screening criteria)
  - Problem for hydro because fuel equivalent costs can equal 0
  - i.e. 10% x fuel equivalent costs = 0
- Would need to develop additional policy parameters for hydro resources

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EIM HYDRO DEB POTENTIAL ALTERNATIVES

Gabe Murtaugh
Sr. Infrastructure and Regulatory Policy Developer

EIM Hydro DEB potential alternatives

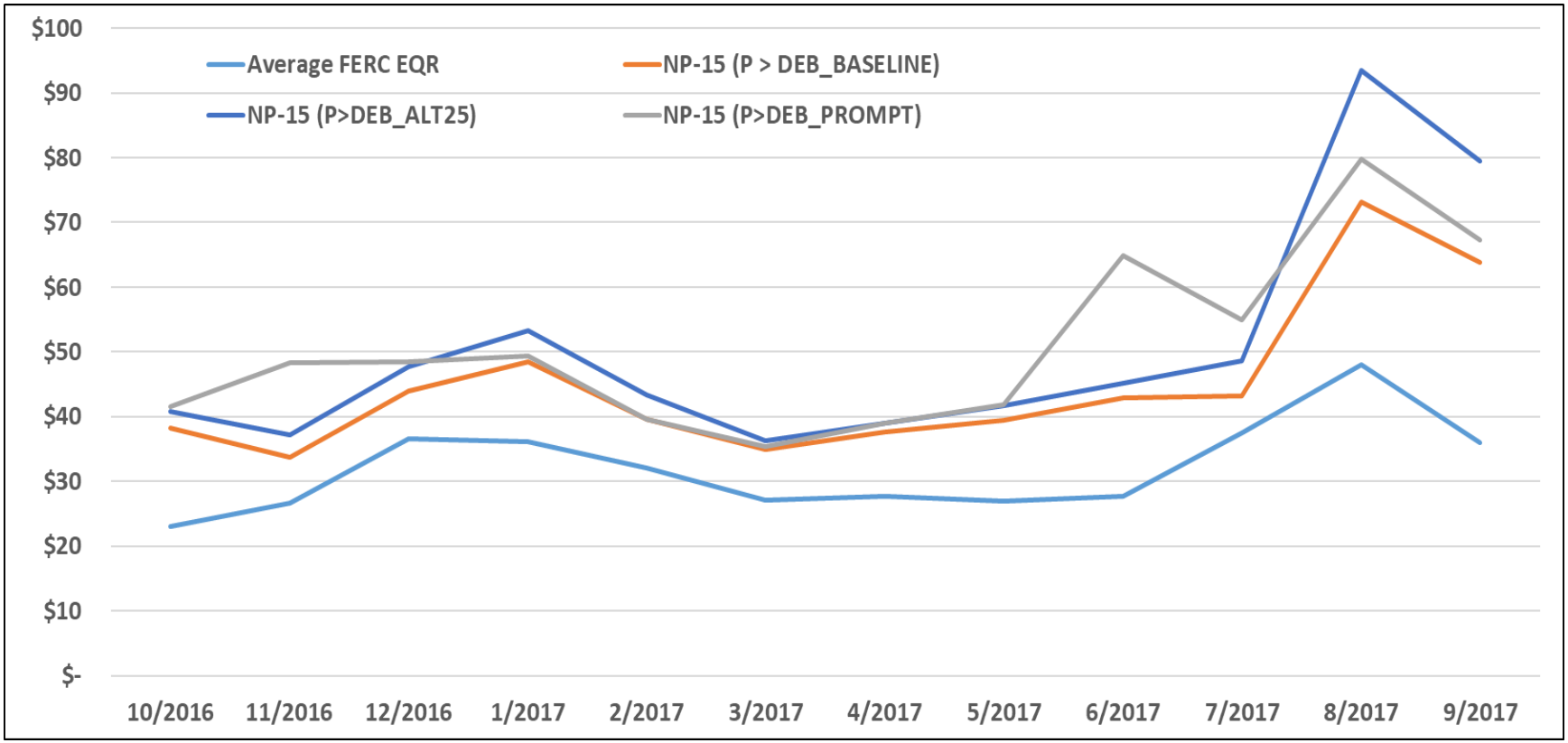
1. Baseline = DA Mid-C Peak * 1.1
   - The baseline is calculated on a daily basis and is the day-ahead Mid-C price plus a 10 percent adder
2. Alternate with 25 percent adder = DA Mid-C Peak * 1.25
   - The alternative DEB is calculated on a daily basis and is the day-ahead Mid-C price plus a 25 percent adder
3. Prompt = MAX(Mid-C Next Month, DA Mid-C Peak) * 1.1
   - The Prompt month DEB is calculated on a daily basis and is the maximum of the Mid-C price and the Mid-C futures price for the following month
   - This calculation might represent a hydro facility with one month of storage capability

* Mid-C peak and monthly futures are not traded on weekends or holidays. We made a simplifying assumption to retain the last available price when data was not available. In practice we may be able to blend/max off-peak or weekend packages, which could make DEBs more attractive.

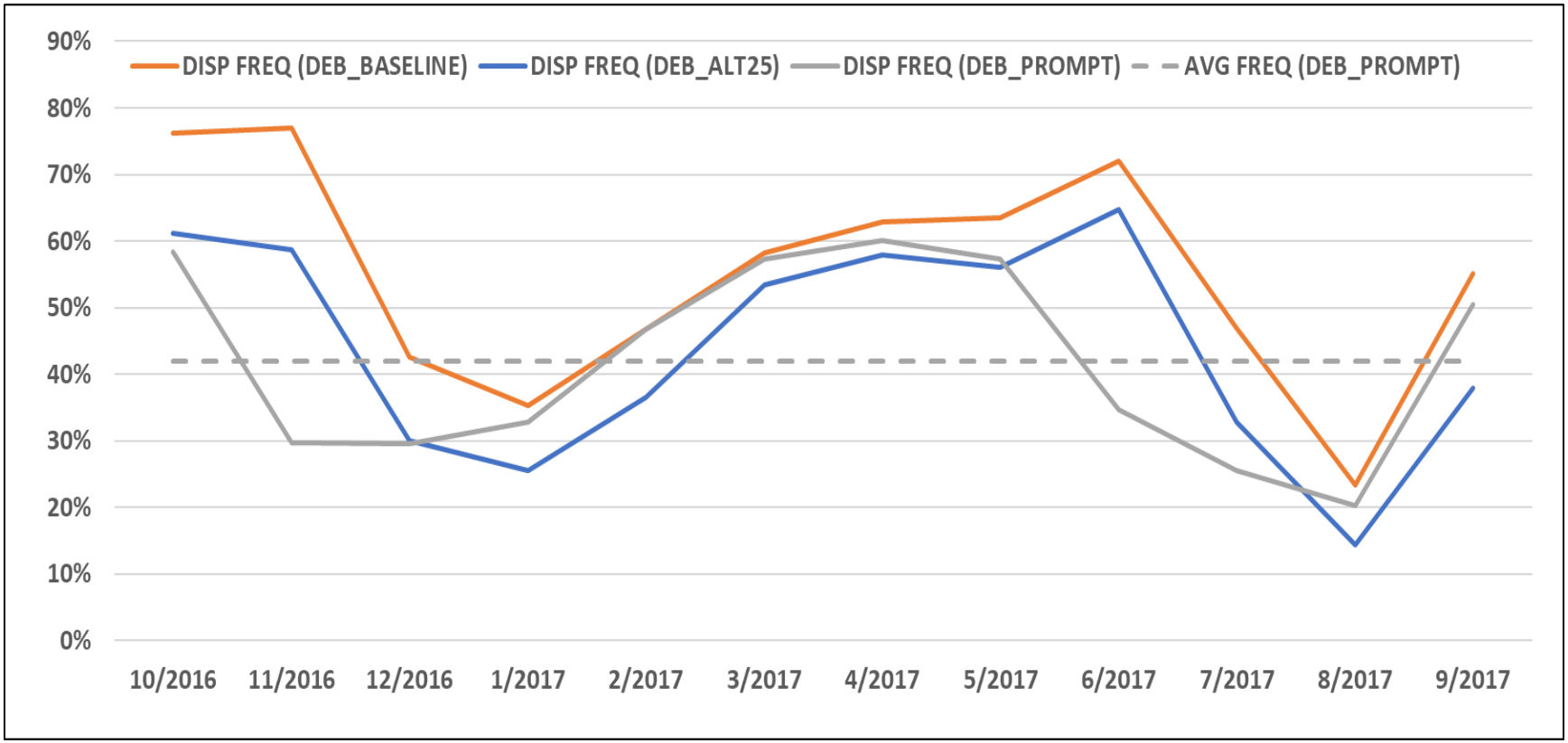
Analysis assumptions

- The market participant always bids into the market at DEBs and is therefore dispatched in the ISO market (NP-15) only when prices are higher than DEBs
- Viewed 1 year of price history in the ISO
- Compared average prices (above the DEB) that the market participant would have received to weighted average (rather than 95th percentile) of observed EQR transaction data
- Found all three options yield higher energy revenues in the ISO markets, than EQR transactions

Average prices when bidding in at the three potential DEBs in the ISO (NP15) compared to weighted average EQR transactions



Percentage of intervals a unit would be dispatched if bid in at the three potential DEBs given ISO (NP-15) prices



Results of alternate DEB analysis

- We may consider an additional DEB option offered as:

  MAX(Mid-C Next Month, DA Mid-C Peak) * 1.1

  – Or potential alternatives/modifications

- We understand that although this DEB may result in greater weighted average prices than EQR transactions, it still may dispatch specific resources “too frequently” during periods when prices are below opportunity costs
- We continue to encourage all market participants to engage in a negotiating a default energy bid if this is the case

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DISCUSSION

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Market and Infrastructure Policy

Discussion items (1 of 3)

- Do the issues uniquely affect EIM entities compared to market participants in the ISO's BAA?
  - How do opportunities to sell outside the ISO affect these issues than internal ISO resources opportunities to sell outside the ISO?
- Are the issues unique to hydro or do they extend to use-limited thermal or other resources?

Discussion items (2 of 3)

- Is this a mitigation or default energy bid issue?
  - If mitigation issues were addressed, would it resolve the DEB issues?
  - What are the most important mitigation issues?
- If inaccurate DEBs are the issue, how should a new DEB be structured?
  - Is the reference level adjustment process an alternative?
  - How would a new DEB differ than the negotiated option?
  - How much headroom above average marginal costs would the new DEB option have?

Discussion items (3 of 3)

- Reference level adjustment requests
  - What circumstances would warrant a hydro resources to request a reference level adjustment?
  - What ways could a hydro resource document an adjustment is justified?
- How could the ISO verify cost estimates of a hydro resource?

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EIM MITIGATION NEXT STEPS

Brittany Dean
Market Design Policy Developer

Additional market power mitigation initiative to begin in Q1 of 2019

- EIM Mitigation Initiative
  - Holistically review EIM DEB, reference level adjustment request changes, and EIM mitigation issues
  - Need to complete DEB and reference level adjustment policy by March to meet CAISO FERC 831 compliance deadline
    - EIM Mitigation policy filed together with CCDEBE
  - More straightforward MPM changes could potentially be finalized along with this or sooner
- Other MPM changes may need to be finalized in a subsequent stakeholder initiative

EIM Mitigation schedule

Milestone	Date
Stakeholder comments due	August 2
Market Surveillance Committee (MSC) meeting topic discussion	August 3
Begin stakeholder process	Late August
EIM Governing Body Meeting	March 2019
Board of Governors Meeting	March 2019