



Commitment Costs and Default Energy Bid Enhancements – Revised Draft Final Proposal

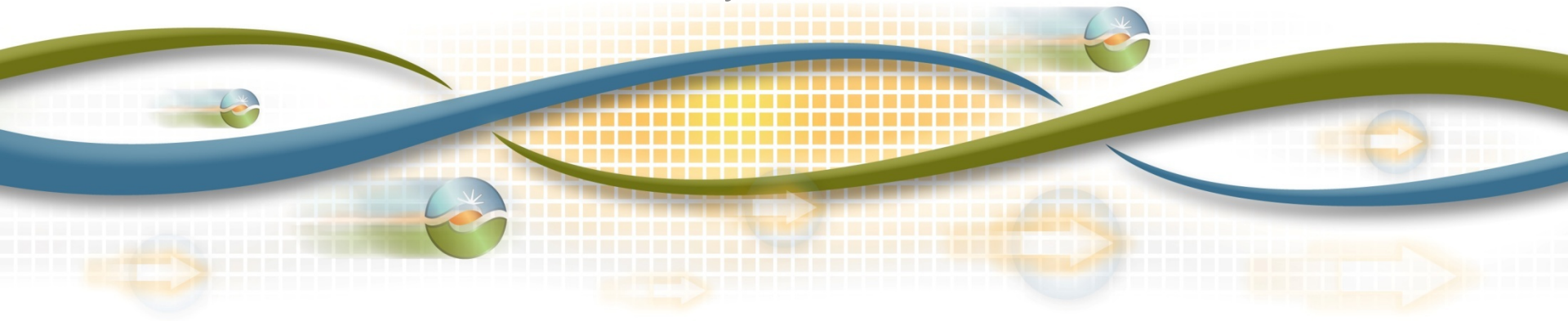
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Purpose of stakeholder call

- Published Draft Final Proposal August 23, 2017
- Discussed modifications to market power mitigation at December 1 MSC meeting
- Refining implementation details with internal business units as part of developing detailed business rules
- Purpose of call is to update market participants on key changes to current proposal before publishing Revised Draft Final Proposal in January

Purpose of stakeholder call cont.

- Major changes impact:
 - Hourly commitment cost bidding
 - Ex ante verification (reasonableness threshold)
 - Ex post verification (based on actual costs)
 - Commitment cost cap
 - Commitment cost market power mitigation
 - Measures to mitigate inter-temporal concerns

Proposal provides a comprehensive solution to ongoing commitment cost and DEB issues

- Support market-based commitment cost offers subject to mitigation and market-based caps
- Provide for ex ante reference level adjustment requests subject to ex ante and ex post verification
- Support hourly commitment cost offers
- Add negotiated option for commitment cost proxy costs
- Make permanent Aliso Canyon Phase 3 measures:
 - Use gas price approximation in DAM
 - After-the-fact filing right at FERC for energy costs
 - D+2 results publication

Changes to definition of the supply bid components

- **Incremental energy costs** – costs associated with providing energy above P_{min}
- **Minimum load costs** – costs associated with operating unit at P_{min} including costs for providing energy at P_{min} . It also includes other costs associated with commitment hours costs even for resources with 0 MWh minimum operating level
- **Startup costs** – costs associated with bringing a unit online or to a state capable of providing energy
- **Transition costs** – multi-stage generators costs associated with moving from one configuration to another

Bidding rule changes allow hourly commitment cost bids

- Allow hourly commitment cost bids in day-ahead and real-time
 - Minimum load will be treated as hourly value
 - Start-up and transition bids will be treated as one value
- Clarify CAISO will not insert bids into market for resources without a must offer obligation, except for:
 - Respecting operating constraints and terminal conditions
 - As needed based on self-schedules or AS awards
- Subject to real-time re-bidding rules
 - Hourly bids for commitment cost bids will transfer to RTM

Summary of supply offer components

Bid component	Market-based bid	Cost-based bid (Reference level adjustment)	Default reference level*
Energy	\$/MWh	\$/MWh	3 DEB Options: negotiated, variable, LMP
Minimum Load Costs	\$/hour	\$/hour	2 Proxy Cost Options: estimated or negotiated
Start-up Costs	\$/start	\$/start	2 Proxy Cost Options: estimated or negotiated
Transition Costs	\$/transition	\$/transition	2 Proxy Cost Options: estimated or negotiated

**If negotiated, then all commitment cost components are negotiated and filed at FERC*

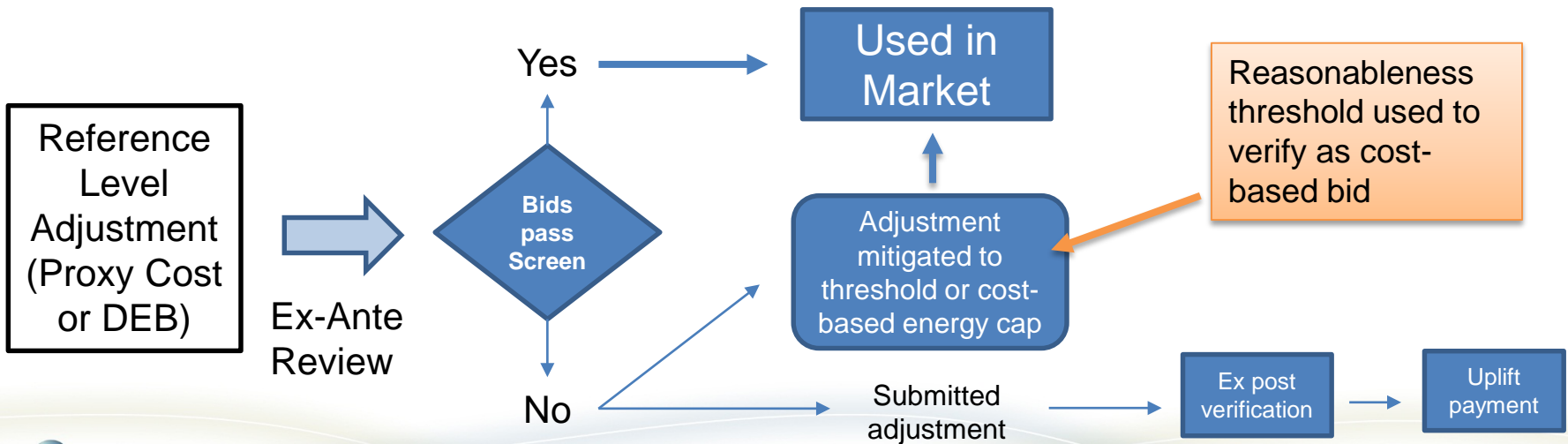
Competitive conditions



Uncompetitive conditions without reference level adjustment



Uncompetitive conditions with reference level adjustment



Allow adjustments to default reference levels

- Support ex ante adjustments to reference levels subject to verification and energy capped at \$2,000/MWh
 - Verify requests against a reasonableness threshold
 - No verification for imports, exports and convergence bids
 - Cap EIM SCs without market-based rate authority to adjusted or unadjusted reference levels

Allow adjustments to default reference levels cont.

- If verified prior to market run, market replaces unadjusted reference level with verified value
- If unverified prior to market run, market will use unadjusted reference level.
 - SC can request to be verified after-the-fact
- If verified after-the-fact, CAISO will re-settle suppliers' invoice with verified value

CAISO will cap both market-based and cost-based bids and verify cost-based bids

Bid component	Market-based bid cap	Cost-based bid cap	Cost-based bid (Reference level adjustment) verification
Energy	\$1,000/ MWh	\$2,000/ MWh	\leq Reasonableness Threshold
Minimum Load Costs	200% of adjusted proxy cost	N/A	\leq Reasonableness Threshold
Start-up Costs	200% of adjusted proxy cost	N/A	\leq Reasonableness Threshold
Transition Costs	200% of adjusted proxy cost	N/A	N/A

**Reference level adjustment requests can be submitted regardless of option*

Market-based commitment cost circuit-breaker caps

- Temporarily set cost multiplier at 200%
- Propose to automatically increase the scalar from 200% to 300% in 18 months
- Analyze mitigation performance with 12 months of data
- If design issues are identified, CAISO would file to delay the automatic increase
 - CAISO will begin stakeholder process to evaluate and address identified issues

Headroom scalars in commitment cost reference levels, estimated option

- Temporarily retain commitment cost scalar in reference levels to 125%
- Propose to automatically decrease from 125% to 110% in 18 months
- Analyze mitigation performance with 12 months of data
- If issues are identified, CAISO would file to delay the automatic decrease
 - CAISO will begin stakeholder process to evaluate and address identified issues

Negotiated commitment cost reference levels

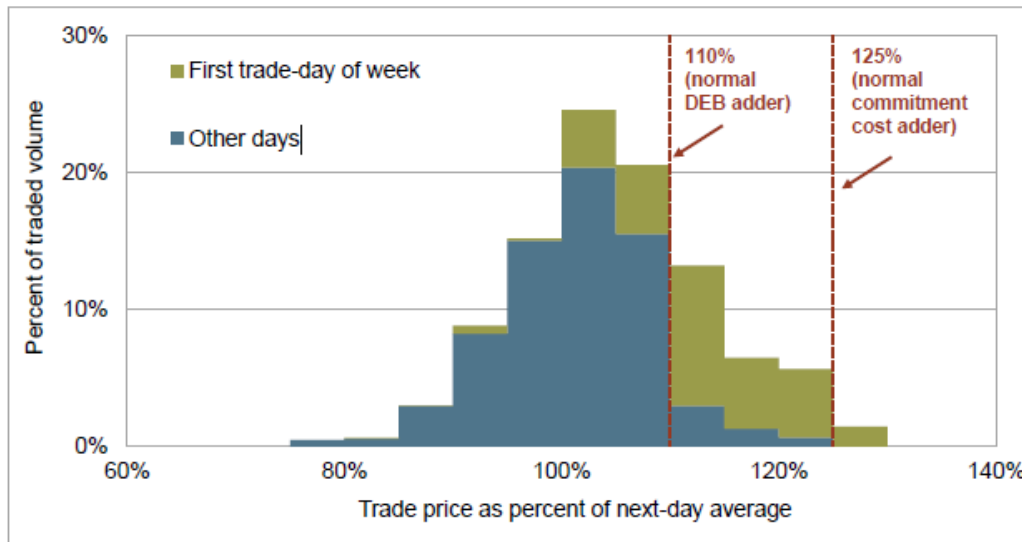
- Add negotiated option for commitment proxy costs
- Negotiated option for systematic differences in cost formulation
- If selected, all commitment cost components must be negotiated

Changes to ex ante verification using reasonableness threshold

- Reasonableness threshold for gas resources
 - Fuel-region level: apply scalar to next day commodity price
 - Re-calculate reference levels with scaled GPs
- Reasonableness threshold for non-gas resources
 - Resource level: Apply scalar to registered cost values
 - Re-calculate reference levels with scaled fuel equivalent costs
- Proposal removes seasonal calculation of scalars
- Proposal retains resource specific feedback loop (tuning based on observed actual costs)

Changes to ex ante verification using reasonableness threshold approach cont.

- Propose gas resources' commodity price will be scaled
 - Monday scalar – 125%
 - Tuesday-Sunday scalar – 110%



Time period analyzed was from June 2016 through December 2016 at the SoCal Citygate hub

Department of Market Monitoring, CCDEBE Working Group #2, April 20, 2017

- Propose non-gas resources' scaled by 110%

Introduce manual verification process for requests above \$1,000/MWh

- CAISO will allow SCs to pursue a manual consultation for reasonableness threshold for energy cost above \$1000/MWh
- If verifiable prior to the market close then the verified value will be the adjusted reference level value

Revised ex post verification based on actual costs

- Align after-the-fact review to the existing data documentation requirements for a FERC filing
- After-the-fact uplift recovery will be based on actual cost
 - Require invoice dated after market that produced relevant award where rules do not allow delay in procurement
 - Attest that no pooling arrangement or balancing rules would allow other than immediate procurement
 - If gas rules allow additional time then do not verify
- Opportunity costs are limited to calculated/negotiated adders under CCE3
- After-the-fact recovery may not include any adders above cost such as risk related adder

Dynamic market power mitigation

- Dynamic commitment cost market power mitigation performed in unit commitment processes
 - Performed in all runs and intervals for binding commitments
- Energy bid mitigation added to short-term unit commitment (STUC)
- Commitment cost mitigation occurs in commitment runs:
 - Binding constraints - effectiveness to non-competitive critical constraints (committed or uncommitted resources)
 - Non-binding constraints – counterflow dispatch exceeds unloaded capacity of non-competitive critical constraints (only committed resources)

Dynamic market power mitigation cont.

- Allow consideration of minimum load energy if a resource can start up within the optimization time horizon
- Allow inclusion of minimum load energy if resource can be shutdown in real-times
- Mitigate all resources under a minimum online constraint

Apply mitigation enhancements to the EIM areas consistently with application within ISO BAA

- Internal constraints will be tested for commitment cost mitigation based on whether binding/non-binding
- EIM net transfer constraints will be tested for commitment cost MPM if binding in the direction of transfers into the EIM area
- Recall –
 - If binding, CAISO will mitigate any resources with negative shift factors to constraint
 - If non-binding, CAISO will mitigate any resources with counterflow dispatch that exceeds the unloaded capacity

Mitigate commitment costs under exceptional dispatches

- Addressing reliability requirements related to non-competitive transmission constraints
 - Include historical commitment cost MPM results in DCPA
- Ramping resources with ancillary services awards or RUC capacity to a dispatch level that ensures their availability in Real-Time
- Ramping resources to Pmin in real-time
- Addressing unit-specific environmental constraints not incorporated into the full network model or market software that affect the dispatch of generating units in the Sacramento Delta


Commitment costs mitigation

- Bids mitigated in the market to:
 - Mitigate minimum load to the lower of the market-based bid and the reference level
 - Mitigate start-up and transitions to the lower of the market-based bid and the reference level
- Exceptional dispatches mitigated to:
 - Mitigate minimum load to the higher of minimum load energy revenues and the lower of the market-based bid and the reference level
 - Mitigate start-up and transitions to the lower of the market-based bid and the reference level

Measures addressing inter-temporal concerns

- Bidding Rules Enhancement's re-bidding rules apply to market awards –
 - Lock real-time re-bidding window once receiving financially binding IFM award or binding RUC start-up instruction
 - Lock real-time re-bidding window once receive binding RTM start-up instruction through minimum up time
- Settlement rules for incremental exceptional dispatches at commitment cost bids considered in initial instruction for the instruction period
- Settlement rules for resources dispatched down at full ramp to settle at bid at the start of the ramp period (based on existing rule for residual imbalance energy)

Plan for stakeholder engagement



Milestone	Date
Draft final proposal posted	August 18, 2017
Stakeholder call	August 30, 2017
Stakeholder written comments due	September 11, 2017
Stakeholder call	December 21, 2017
Stakeholder written comments due	January 11, 2018
Revised draft final proposal and business rules posted	January 24, 2018
Stakeholder call	January 31, 2018
Stakeholder comments due	February 14, 2018
EIM governing body meeting	March 8, 2018
Board of Governors meeting	March 21 & 22, 2018