Commitment Costs and Default Energy Bid Enhancements (CCDEBE)

Proposed revisions to revised straw proposal

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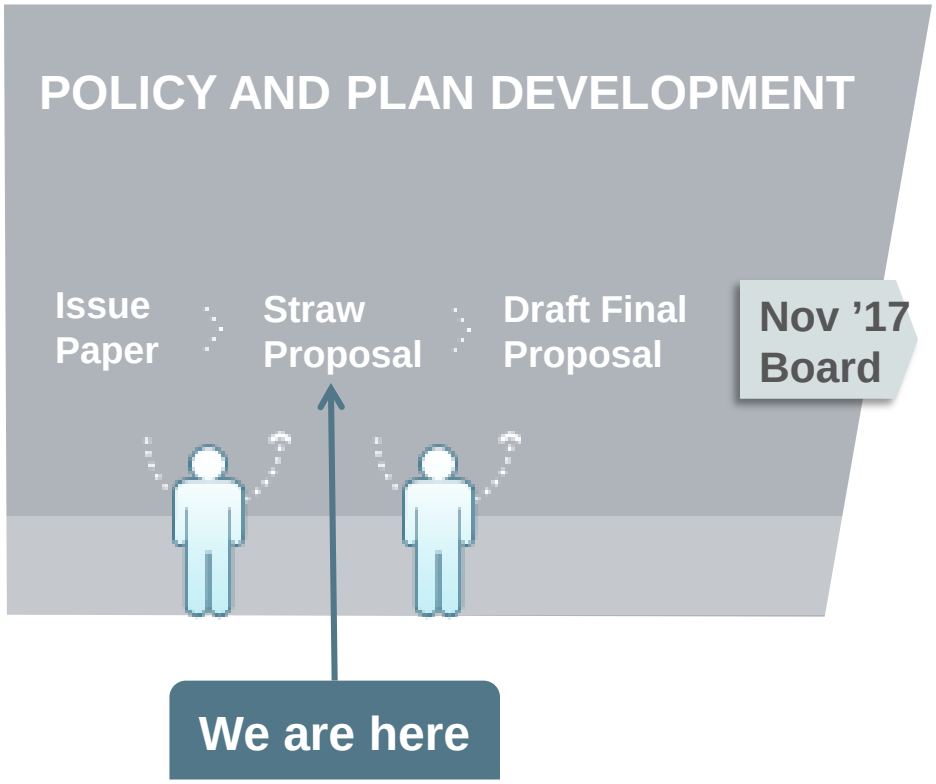
Agenda

Time	Topic	Presenter
1:00 – 1:05	Introduction	Kim Perez
1:05 – 1:10	Overview	Cathleen Colbert
1:10 – 1:55	Planned changes to revised straw proposal - mitigation	Cathleen Colbert
1:55 – 2:00	Questions & Next Steps	Kim Perez

ISO Policy Initiative Stakeholder Process



Plan for stakeholder engagement

Milestone	Date
Issue paper posted	November 18, 2016
Stakeholder call	November 22, 2016
Stakeholder written comments due	December 9, 2016
Straw Proposal Posted	June 30, 2017
Stakeholder meeting	July 6, 2017
Stakeholder written comments due	July 20, 2017
Revised straw proposal	August 1, 2017
Stakeholder meeting	August 3, 2017
Stakeholder call	August 11, 2017
Stakeholder written comments due	~~August 10, 2017~~ August 15, 2017
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Board of Governors meeting	November 1-2, 2017

OVERVIEW

Objective: Comprehensive solution to ongoing commitment cost and DEB issues

- Suppliers need more flexibility to reflect unique costs and volatility
  - Support integration of renewable resources through incentivizing flexible resources participation during tight fuel supply
  - Account for costs of flexible resources (gas and non-gas) to reduce risk of insufficient cost recovery
  - Encourage participation of non-RA and voluntary EIM resources
- ISO needs to comply with FERC Order 831
  - Requires supporting verified costs of energy bids above $1,000/MWh

ISO proposes to allow market based offer for “three-part bid” subject to mitigation and allow greater flexibility to negotiate or adjust each component to support market efficiency

	Type	Sub-type	Market Based Offer	Cost Based Offer
Hourly	Energy	Variable Cost	X	Mitigated Price
Hourly	MLC	Variable Cost Fixed Cost	X	Mitigated Proxy Cost
Daily	TC	Fixed Cost	X	Mitigated Proxy Cost
Daily	SUC	Fixed Cost	X	Mitigated Proxy Cost

PLANNED CHANGES TO REVISED STRAW PROPOSAL - MITIGATION

Proposed differences in commitment cost mitigation

Mitigation Design Feature	IFM	STUC	HASP	RTM Pre-Dispatch/FMM
Requires new LMPM process (all constraints run and post-processing)	N	**Y**	N	N
Identifying potentially pivotal suppliers	Includes net buyers and sellers			
Type of constraint tested	~~Critical (85% Flow)~~Change to binding plus additional constraints identified by CAISO as likely needing commitments to resolve a constraint			
RSI calculation – allows commitment/de-commitments	Y, impacts WC and SPCF PPS			
RSI calculation – basis for maximum capacity that could be withheld from pivotal suppliers	Max effective available capacity	Max effective available capacity (ramp constrained)		
RSI calculation – demand for counterflow should include available counterflow not dispatched up to unloaded capacity	Only for non-binding constraints include in the denominator of the RSI calculation the lower of effective capacity not dispatched in AC run or unloaded capacity (Limit-AC flow)			
Mitigation Criterion	Net effect of commitment on congestion system-wide (replace with default shadow price if not binding)			

Clarify how non binding constraints are to be identified for mitigation testing

- Proposal revised to test:
  - All binding constraints
  - Non-binding constraints identified as likely needing commitments to resolve a binding constraint
- Propose CAISO needs flexibility to identify the additional constraints since area of concerns may change based on system dynamics
  - Based on a study or a forwarding looking RSI calculation

Clarify how non binding constraints are to be identified for mitigation testing cont.

- Potential studies or assessments to identify non-binding constraints to test could include:
  - Use critical constraints
  - Perform static structural competitive test
  - Base on local capacity study and seasonal assessments
  - Use D+1 or IFM results and static SF for non-binding constraints to each node to calculate RSI for every constraint in an off-line tool

Propose determining non-competitive LMP for commitment cost mitigation using default shadow price if non-binding

- Propose to calculate a non-competitive LMP for commitment cost mitigation (LMP_i^{NCCCM}) using
  - Actual shadow price if binding
  - Default shadow price if non-binding
- Draft final proposal appendix will remove use of net effect of commitments and replace with LMP_i^{NCCCM}

$$LMP_i^{NCCCM} = \sum_{l=1}^{n} SF_{l,i} * \text{shadow price}_{actual\ or\ default}$$

Propose to calculate default shadow price using an established list of default sensitivity ratios

- Propose default shadow price is the expected shadow price for every transmission line
  - An estimate representing expected sensitivity of that solution to the constraint
- Determine default shadow price by multiplying all constraints run system marginal energy component (SMEC) by the sensitivity ratio (SR)

$$shadow\ price_{default} = SMEC * SR$$

Propose to establish static list of default sensitivity ratios for use in determining default shadow price

- Determine worst case sensitivity of solution to the constraint using the largest historical shadow price
- Control sensitivity to objective function's optimal solution (SMEC) by dividing the largest historical shadow price by the SMEC for that run

$$SR = \frac{\max(\text{shadow price}_{actual})}{SMEC}$$

Propose minor revision to second RSI calculation from revised straw proposal

- Second residual supply index (RSI) calculation
  - Propose change to add lower of effective capacity not dispatched in AC run or unloaded capacity (Limit-AC flow) to DCF in denominator

$$RSI_l^{CCM} = \frac{SCF_l^{PPSCCM} + SCF_l^{FCSCCM}}{DCF_l^{CCM} + \min\left[\sum_{i=1}^{n} SF_{l,i} * (ENGYMAX_i - DOP_i), Limit - ACflow\right]}$$

- Withheld Capacity (WC) and Supply of Counter Flow (SCF) from potentially pivotal suppliers
  - Add conditional logic to allow shutdowns (discussed at 8/3 MTG)
- Supply of Counterflow (SCF) from fringe competitive suppliers and Demand for Counterflow (DCF)
  - Same formulation as energy

Propose to apply mitigation tests separately to energy versus commitment cost components

- If energy mitigation criterion at resource is met ➔ mitigate energy component if energy criterion fails (changed from mitigate entire supply offer if failed)

- If commitment cost mitigation criterion at resources is met ➔ mitigate commitment cost components to reference level (proxy cost * 110%+O.C.)

- Rationale for proposed change:

  – Commitment & dispatch decisions occur at different times

  – Energy mitigation largely tests for potential price impact whereas commitment cost mitigation largely tests for potential uplift impact

Propose to mitigate resources identified in set of resources under minimum online constraints

- If resource is identified within a set of resources under a minimum online constraint ➔ mitigate commitment cost components to reference level for each component (proxy cost * 110%)
- Rationale for proposed change:
  - While MOCs for managing thermal constraints will largely be reduced under future enhancements, there may come a need to enforce a MOC in the market
  - CAISO believes commitments of resources under a MOC are by definition uncompetitive and should be limited to a cost based offer

QUESTIONS AND NEXT STEPS

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APPENDIX

Principles under uncompetitive conditions – mitigation

- Market must be protected against market power by testing for insufficient supply without which the market cannot provide competitive incentives
- Three pivotal supplier test is sufficient because it is a robust design and applies a consistent methodology across the three-part offer
- Market should only mitigate when a mitigation test shows potential to exercise market power and balance a reasonable output of false positives/false negatives
- Methodology should consider implementation concerns

CAISO tests for market power on its energy bids using local market power mitigation (LMPM)

CAISO applies local market power mitigation to its incremental energy market based offers which includes:

- All constraints run
- Dynamic competitive path assessment (DCPA) performs three-pivotal supplier test
- LMP decomposition establishes mitigation criterion for mitigating at resource level

Challenges with applying current three pivotal supplier test to commitment cost mitigation

- Would need to evaluates if constraint is competitive or un-competitive by removing largest suppliers and testing if supply including minimum load energy – **lumpy amount** - could relieve constraint

- Concern - unit not mitigated because commitment decision would relieve congestion

Figure 1: Example of difficulties applying dynamic mitigation to commitment costs

Propose market-based commitment costs subject to mitigation

- CAISO is the only ISO that does not support market based commitment costs bids subject to mitigation
- Propose mitigation of commitment costs using three-pivotal supplier test
  - Allow suppliers to submit market-based commitment cost bids
  - Apply dynamic market power mitigation test to market-based commitment cost bids

Propose market power mitigation applied dynamically in the market to market based commitment costs

Introduce a commitment cost market power mitigation in all unit commitment processes that:

- Does not change all constraints run
- Performs second RSI calculation
- Add a mitigation criterion at resource level for commitments