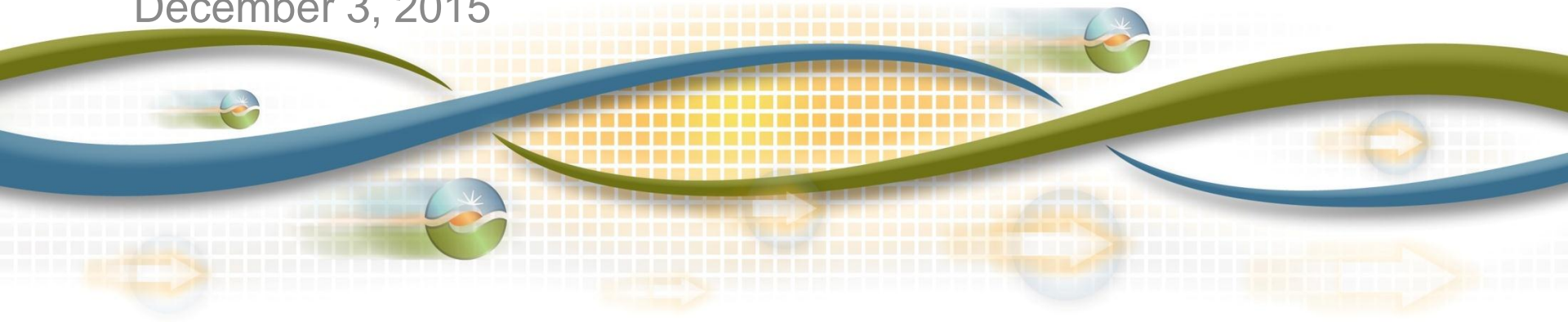# Bidding Rules
Revised Straw Proposal

Cathleen Colbert

Kallie Wells

Market Design and Regulatory Policy
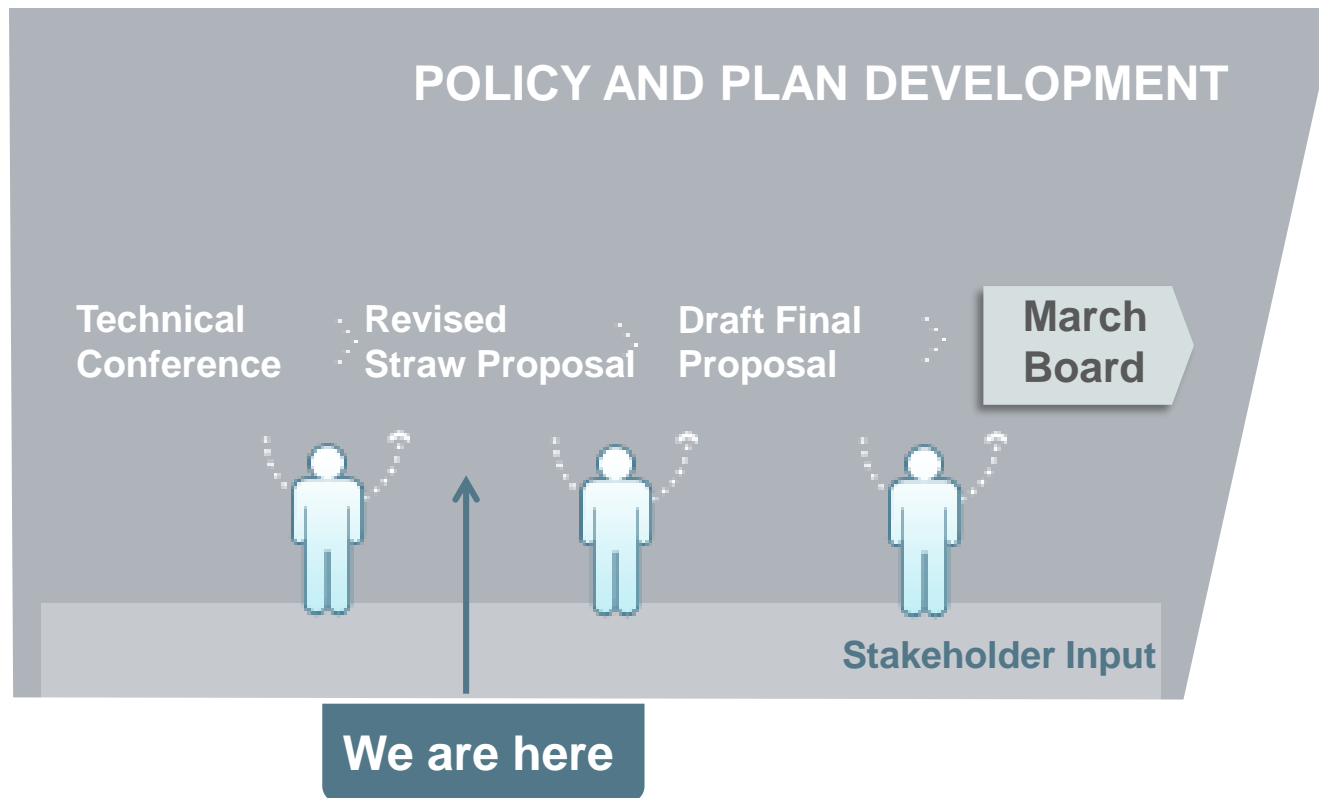
December 3, 2015

December 3, 2015 stakeholder meeting agenda

Time	Topic	Presenter
10:00 – 10:05	Introduction	Kim Perez
10:05 – 10:10	Updated schedule	Kim Perez
10:10 – 10:15	Overview	Cathleen Colbert
10:15 – 10:45	Resource characteristics proposal	Kallie Wells
10:45 – 12:00	Commitment cost mitigation proposal	Kallie Wells
12:00 – 1:00	Lunch	
1:00 – 2:30	Commitment cost parameters proposals	Cathleen Colbert
2:30 – 3:15	Commitment cost bidding proposals	Cathleen Colbert
3:15 – 3:55	Energy bidding proposals	Cathleen Colbert
3:50 – 4:00	Next Steps	Cathleen Colbert

California ISO

ISO Policy Initiative Stakeholder Process

POLICY AND PLAN DEVELOPMENT

Technical Conference

Revised Straw Proposal

Draft Final Proposal

March Board

Stakeholder Input

We are here

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Stakeholder schedule update

Date	Milestone
November 23, 2015	Revised straw proposal posted
December 03, 2015	Stakeholder meeting
December 17, 2015	Stakeholder comments due
January 05, 2016	Draft final proposal posted on Section 7.2.1
January 12, 2016	Stakeholder call on Section 7.2.1
January 19, 2016	Comments due on Section 7.2.1
February 03, 2016 - February 04, 2016	Board of Governors Meeting for Section 7.2.1
February 15, 2016	Draft final proposal posted
February 22, 2016	Stakeholder call
March 02, 2016	Stakeholder comments due
March 24, 2016 - March 25, 2016	Board of Governors Meeting

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Bidding Rules Enhancements - Overview

- The ISO explored allowing resource characteristics to reflect preferred operating parameters of the resource and found two characteristics warranting market values.

- The ISO explored impact triggered market power mitigation methods for commitment cost compared to its current bid cap method and found:

  - Resources that would benefit from increased flexibility (e.g. MOC) would be mitigated to their proxy costs **forgoing 25% headroom**.

  - Dynamic impact based mitigation would not be feasible and an after-the-fact process would allow market power to influence the market solution.

  - DMM's analysis supports 25% headroom of the bid cap method allows for sufficient cost recovery in most instances and for extreme events an after-the-fact recovery is proposed.

- Since the ISO found its bid cap method provides the most benefit for cost recovery, the ISO proposes improvements to its cost parameters to further strengthen this method.

- The ISO explored and proposes solutions to market inefficiencies resulting from inaccurate modelling of costs resulting in potential miss-valuing of resources.

- The ISO explored market inefficiencies not mitigated under its energy bid market power mitigation that could require reevaluation of its energy bidding flexibility rules.

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Resource Characteristics

Kallie Wells

Resource Characteristics

- ISO is proposing two sets of data for a subset of Masterfile fields

- **Design capability** characteristics reflect the maximum, or minimum design capability of the resources

- **Market based** characteristics can reflect preferred operating parameters of the resource.
  - Maximum daily starts and ramp rates

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Resource Characteristics – Design capabilities

- Consist of all existing Masterfile resource characteristic fields

- Must reflect the maximum, or minimum, design capability of the resource (e.g., maximum daily starts, ramp rates)

- For characteristics with both market and design values in Masterfile, the ISO proposes to make design values available to operators in the event of an exceptional dispatch under stressed system conditions.

- ISO proposes to amend Tariff Section 4.6.4. and Tariff definition of "Maximum daily starts" to "design capability" rather than "physical characteristics."

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Resource Characteristics – Market based

- Masterfile fields with market characteristics can be used to reflect preferred operating parameters of the resource.
    - Updates would follow current 5 business day lead time for changes to become effective.
- **Maximum daily starts** can be used to reflect preferred number of daily starts to minimize wear and tear, ensure contractual limitations are not violated, or other economic trade-offs
    - Must, at a minimum support RA showings and adjust with changes to those showings.
- **Ramp rates** will no longer be a component of daily bids but will have a market based value in Masterfile.
    - Must, at a minimum support flexible capacity attributes
    - ISO has greatly improved modeling capabilities (e.g., MSG resources)
    - Reduce adverse impact from differences between daily bid-in ramp rates in market and ramp rates used to make awards for flexible ramping product and corrective capacity.

Resource Characteristics – Responsibility

The ISO seeks input on how to assign responsibility of submitting design versus market characteristics in the Master File between participating generators and scheduling coordinators.

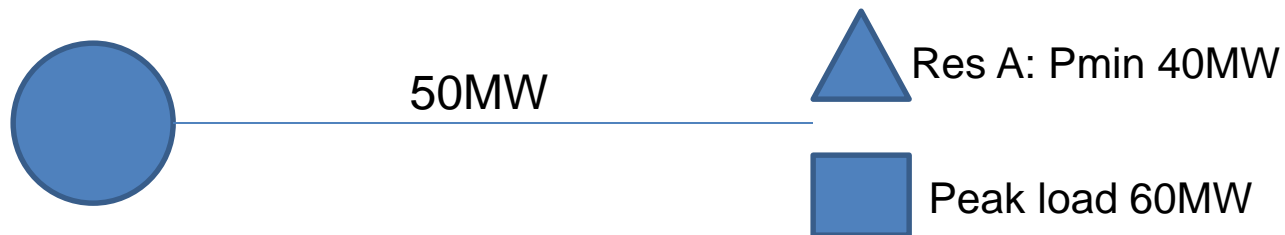# Commitment Cost Mitigation

Kallie Wells

Commitment cost mitigation – survey of other ISOs

ISO/RTO	Mitigation	Additional details
CAISO	Bid cap	125% of daily calculated proxy cost or 150% of a proxy cost held fixed for a minimum of 30 days.
ISO-NE	Conduct and impact test	Restricted from fuel price adjustment for 2 (first offense) to 6 months (second offense). Energy, start-up, and minimum load bids set to reference level.
MISO	Conduct and impact test	Pre-determined thresholds to trigger conduct and impact tests. Mitigation only applied in the presence of binding transmission constraints or reserve zone constraints.
NYISO	Conduct and impact test	Pre-determined thresholds to trigger conduct and impact tests.
PJM	Structural test (three pivotal suppliers) for active constraints	6 month hold on market based or cost based option for commitment costs.
SPP	Conduct and impact test	Mitigation only applied in presence of a binding constraint or reserve zone, or resource committed to address Local Reliability Issue.

- Most other ISOs have a variation of a conduct and impact test

- PJM has a 3 pivotal supplier test

- Evaluated how either method could be effectively implemented in CAISO markets

Commitment cost mitigation – structural test

- Three pivotal supplier test is triggered by a *binding* constraint.

- Market power in commitments may alleviate the binding constraint, and therefore go undetected
  - Res A is necessary to serve peak load given transmission limit
  - Once committed to pmin, constraint no longer binding, tested, and therefore Res A's bids are not subject to mitigation

50MW

Res A: Pmin 40MW

Peak load 60MW

- Test all constraints on critical constraint list and mitigate
  - Contribute to over-mitigation, which was a driving concern when developing the dynamic path assessment

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Commitment cost mitigation – conduct and impact test

- CAISO's bid cap could be thought of as a conduct and impact test without the impact test to trigger mitigation.

  - How would the ISO implement an impact test?

  - Energy LMPs or BCR

- Commitment costs are not directly reflected in LMPs, therefore energy LMPs may not be an effective impact test trigger.

	Min load	Energy	LMP
Market bid	$50,000/hr	$50/MWh	$50/MWh
Reference level bid	$5,000/hr	$50/MWh	$50/MWh

- BCR trigger would be an after-the-fact process and would not fully address economic withholding concerns and it would allow for market power to impact market prices.

- Out of market commitments or mitigated offers in other ISOs are at reference level bids, where as ISO commitments for similar reasons are done within the market at costs up to 125%.

- At this point, ISO does not see any additional benefit from implementing a conduct and impact test over the current 125% bid cap for commitment cost mitigation.

Commitment cost mitigation – differentiated bidding headroom

- Straw proposal proposed determining the bid cap based on the sum of various percentage increases of the individual cost components of the proxy cost calculation

- The current headroom in the 125% bid cap is to allow stakeholders to manage their risks
  - Gas price, cash-out, etc.

- ISO revised its proposal to no longer consider differentiated bidding headroom for commitment costs.

Commitment cost mitigation – ISO's proposal

- Given the challenges with applying a conduct and impact test, or structural test, to effectively mitigate commitment costs in the California ISO markets, and

- not implementing differentiated bidding headroom, and

- the improvements being proposed on calculating commitment costs, and

- allowing after-the-fact recovery of extreme gas costs,

- the ISO is proposing to retain the current commitment cost mitigation methodology of the 125% bid cap.

Commitment Cost Calculations

Cathleen Colbert

ISO's proposals to improve its commitment cost calculations

Issue	Proposal
Gas price index may not reflect real-time gas purchase costs	Routinely use earliest published index for the day-ahead market, move day-ahead market timing to 11 am to 2 pm, and allow for consideration of real-time gas purchases above the gas price index.
Gas price index may not reflect gas transportation costs	Increase the flexibility of registering fuel regions and allow for cap-and-trade credits to the base gas transportation rates for resources with GHG compliance costs within these fuel regions.
Electricity price index may not reflect start-up energy costs	Change the electricity price index calculation consistent with the registered cost option to represent a projected electricity price during unit start-up or cost of auxiliary power provided by the generator based on a unit with a heat rate of 10,000 Btu/KWh.

Improve gas commodity price

California ISO

Gas and electric market alignment
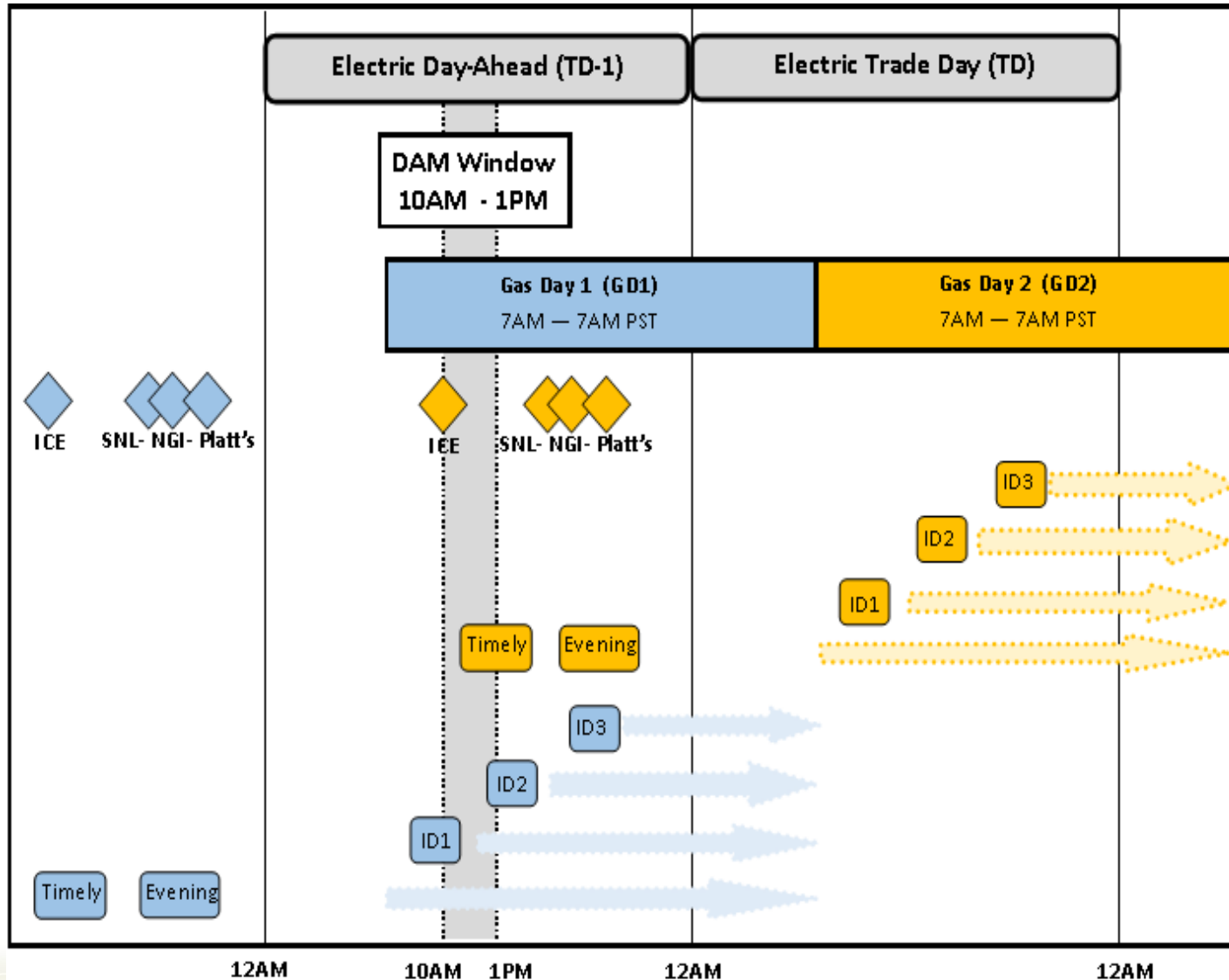
ISO seeks stakeholder input for improvements to the natural gas commodity price used in gas price index (GPI)

- **Option 1:** Use GD1 and GD2 prices to reflect natural gas price volatility differences between GD1 and GD2

- **Option 2:** Use day-ahead price for GD2

- **Option 3**: Use GD1 price currently used by the market

Option 1: Use GD1 and GD2 prices to reflect natural gas price volatility differences between GD1 and GD2

- The ISO is exploring the best method to allow gas price volatility from either upward or downward movements between GD1 and GD2 prices to be reflected in the ISO's calculations. The ISO seeks input on two potential methods:

  - The ISO could use the maximum of the two gas day indices.

  - The ISO could use an average weighted by percentage of hours.

- The manual price spike procedure would no longer be performed under this option.

- The ISO may need to move its day-ahead market window later in the day, for example to 11 AM to 2 PM.

California ISO

Option 2: Use day-ahead price for GD2

- Routinely use the day-ahead index for GD2 as a part of its normal operations and no longer perform the manual price spike procedures.

- Provides an incremental improvement however with a price risk remaining associated with downward price movements between GD1 and GD2.

- The ISO may need to move its day-ahead market window later in the day, for example to 11 AM to 2 PM.

Option 3: Use GD1 price currently used by the market

- Maintaining current practice of the market does not improve the price information used in the ISO's proxy cost calculations.

- The ISO seeks stakeholder input as to whether the trade-off of moving the day-ahead window to 11AM – 2PM in order to improve cost recovery is appropriate or too costly.

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Allow for after-the-fact recovery

- The ISO proposes a process as follows:

  - This process is to be used when a resource must procure incremental natural gas in real-time at a price above the gas price index plus the natural gas headroom when gas market price spikes above 25 percent.

  - The process will be an after-the-fact validation subject to documentation and verification of actual costs and verification that those costs were in line with market conditions at the time by no later than 77 business days from the relevant trading day.

  - The ISO will verify the actual cost documentation which should be provided in the form of an invoice between unconnected entities.

  - The ISO will include bid costs based on the actual gas purchase price in the resource's BCR calculations if the actual cost of the purchases can be verified.

Allow for after-the-fact recovery

- The resettlement will be performed in the following 3 steps:

  - Recalculate proxy costs for start-up and minimum load as well as for any mitigated energy bids using the actual cost of the procured gas.

  - Recalculate the resource's BCR calculations using the updated costs in Step 1.

  - Resettle the adjusted BCR amount in the Recalculation Settlement Statement consistent with the dispute timelines used for all ISO settlement disputes.

Allow for after-the-fact recovery

- As an alternative to this approach, the ISO is proposing that market participants have the right to file for cost recovery at FERC.

- The ISO is concerned its expertise would be insufficient to accurately validate the actual cost of procurement especially because the ISO lacks insight into hedging instruments offsetting price risk held by Scheduling Coordinators.

- The ISO is concerned a venue for disputes outside of FERC could disincentive good utility practice through making generators indifferent to fuel price.

- The ISO seeks stakeholder input as to which alternative is more attractive.

Improve gas transportation adder

GHG costs associated with gas transportation rates

A	B	C	D	E	F
				Effective April 1, 2016	
ISO's Fuel Regions	**Intra-state Transporation Rates ($/therm)**	**AB 32 CARB Fee Credit**	**Cap and Trade Exemption' Credit**	**Effective Rate for Covered Entities**	**Effective Rate for Non-covered Entities**
PGE (Backbone level rate)	0.00915	0.00056		0.00859	0.00915
PGE2 (Other Customers Rate)	0.02921	0.00056		0.02865	0.02921
SCE1 (<3 million therms/year)	0.10554	0.0011	*0.01932*	0.08512	0.10554
SCE2 (> 3 million therms/year)	0.03688	0.0011	*0.01932*	0.01646	0.03688
SDG&E1 (<3 million therms/year)	0.105420	0.00041	*0.02249*	0.08252	0.105420
SDG&E2 (> 3 million therms/year)	0.036380	0.00041	*0.02249*	0.01348	0.036380

- The ISO proposes to create a more flexible process for scheduling coordinators to request adjustments to the fuel region values for registration in the Master File.

- This process would be consistent across the ISO's markets including EIM.

- The ISO will create two values for each fuel region to differentiate rates paid by covered and non-covered entities, where applicable.

Improve electricity price index

California ISO

Allow for after-the-fact recovery

- The ISO found the EPI to be unduly burdensome to stakeholders to project the prices used by the ISO.

- The ISO proposes the calculation for the EPI be done by multiplying the start-up auxiliary energy by the monthly GPI by a factor of 10.

  – Consistent with calculation for EIM resources and registered cost resources.

  – This represents a projected electricity price during unit start-up or cost of auxiliary power provided by the generator based on a unit with a heat rate of 10,000 Btu/KWh.

Commitment Cost Bidding Flexibility Rules

Cathleen Colbert

ISO's proposals to improve its resource commitments

Issue	Proposal
Inefficient accounting for minimum load costs after a Pmin rerate	Calculate actual commitment costs based on the resource's default energy bid (DEB).
Resources without a day-ahead schedule cannot rebid commitment costs.	Allow resources without a day-ahead schedule to rebid commitment costs in the real-time market.
The ISO market inserts day-ahead market bids into STUC for resources that are not resource adequacy resources that are not scheduled in the day-ahead market and do not resubmit bids into the real-time market.	No longer generate bids for STUC for non-resource adequacy resources that do not resubmit bids into the real-time market.

Proposed change to correct inefficient accounting for minimum load costs after a Pmin rerate

Current practice undervalues the total cost of Resource B after its Pmin rerate, this results in potentially displacing a more economic resource.

	Data	Units	Formula	Resource A	Resource B	Resource B w/ Pmin rerate		
						Current	Scale MLC	Use DEB
[A]	Pmin	MW		100	100	185	185	185
[B]	Pmax	MW		300	300	300	300	300
[C]	Capacity above Pmin	MW	[B] - [A]	200	200	115	115	115
[D]	Min load cost	per hour		$1,000	$1,000	$1,000	$1,850	$5,250
[E]	Bid cost	per MWh		$30	$50	$50	$50	$50
[F]	Min load cost / MWh	per MWh	[D] / [A]	$10	$10	$5	$10	$28
[G]	Min load cost / hour			$1,000	$1,000	$1,000	$1,850	$5,250
[H]	Total bid cost / hour		[C] x [E]	$6,000	$10,000	$5,750	$5,750	$5,750
[I]	Total cost		[G] + [H]	$7,000	$11,000	$6,750	$7,600	$11,000

Proposed change to correct inefficient accounting for minimum load costs after a Pmin rerate

ISO proposes to modify the minimum load cost based on DEB costs to accurately commit resources based their actual costs.

	Data	Units	Formula	Resource A	Resource B	Resource B w/ Pmin rerate Current	Scale MLC	Use DEB
[A]	Pmin	MW		100	100	185	185	185
[B]	Pmax	MW		300	300	300	300	300
[C]	Capacity above Pmin	MW	[B] - [A]	200	200	115	115	115
[D]	Min load cost	per hour		$1,000	$1,000	$1,000	$1,850	$5,250
[E]	Bid cost	per MWh		$30	$50	$50	$50	$50
[F]	Min load cost / MWh	per MWh	[D / [A]	$10	$10	$5	$10	$28
[G]	Min load cost / hour			$1,000	$1,000	$1,000	$1,850	$5,250
[H]	Total bid cost / hour		[C] x [E]	$6,000	$10,000	$5,750	$5,750	$5,750
[I]	Total cost		[G] + [H]	$7,000	$11,000	$6,750	$7,600	$11,000

No longer generate bids for STUC for non-resource adequacy resources that do not resubmit bids into the real-time market and did not receive day-ahead award

- The ISO market inserts day-ahead market bids into STUC for resources that are not resource adequacy resources that are not scheduled in the day-ahead market and do not resubmit bids into the real-time market.

- The ISO proposes to no longer generate bids for STUC for these resources since it finds forcing participation for non-RA resources is an unintended consequence of its current process and should be resolved.

Allow resources without a day-ahead schedule to rebid commitment costs in the real-time market

- The ISO currently does not allow resources that bid into the day-ahead market but that did not receive a day-ahead schedule to rebid commitment costs in the real-time market.

- Resources without a day-ahead schedule may have additional costs associated with procuring gas during more illiquid periods and/or changes to gas prices.

- The ISO notes two potential inefficiencies as a result of this practice, the unintended market outcomes are:

  – Resources might not be able to recover their commitment costs.

  – Inefficient resource commitment because the real-time market will miss-value minimum load costs

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Allow resources without a day-ahead schedule to rebid commitment costs in the real-time market

- The ISO proposes to allow non-RA resources without a day-ahead schedule to rebid commitment costs in the real-time market.

- The resubmitted bid costs can be submitted up to the close of a real-time market for the trade hour the non-RA resource without a day-ahead schedule chooses to begin participating.

- For example, for those wanting to begin participation for HE 8, a resource can resubmit bids up to 5:45AM on the trade day which will be cleaned and set the commitment costs for the day.

California ISO

# Energy Bidding Flexibility Rules

Cathleen Colbert

Change from straw proposal

- The ISO's straw proposal proposed settling BCR based on the bid prices resulting in the commitment decision subject to an inter-temporal constraint.

- The ISO evaluated potential methods to determine the appropriate price to "lock" for BCR settlement and found it unclear what bid price should be "locked" for hours without RTM bid prices.

- The ISO is no longer proposing this as a solution because it found the solution:

  - Could increase or change market inefficiencies impacting BCR payments depending on criteria chosen to "lock" bid price

  - Would be a significant market change not necessarily warranted due to lack of activity

  - Could conflict with bidding flexibility provided available for legitimate purposes through a broad market design rule intended to resolve specific market inefficiencies

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Changing bids after a commitment decision during an inter-temporal constraint

Configuration	Min Gen	Max Gen	Min On Time	Min Down Time
C2	60	100	480	360
C1	10	40	360	360
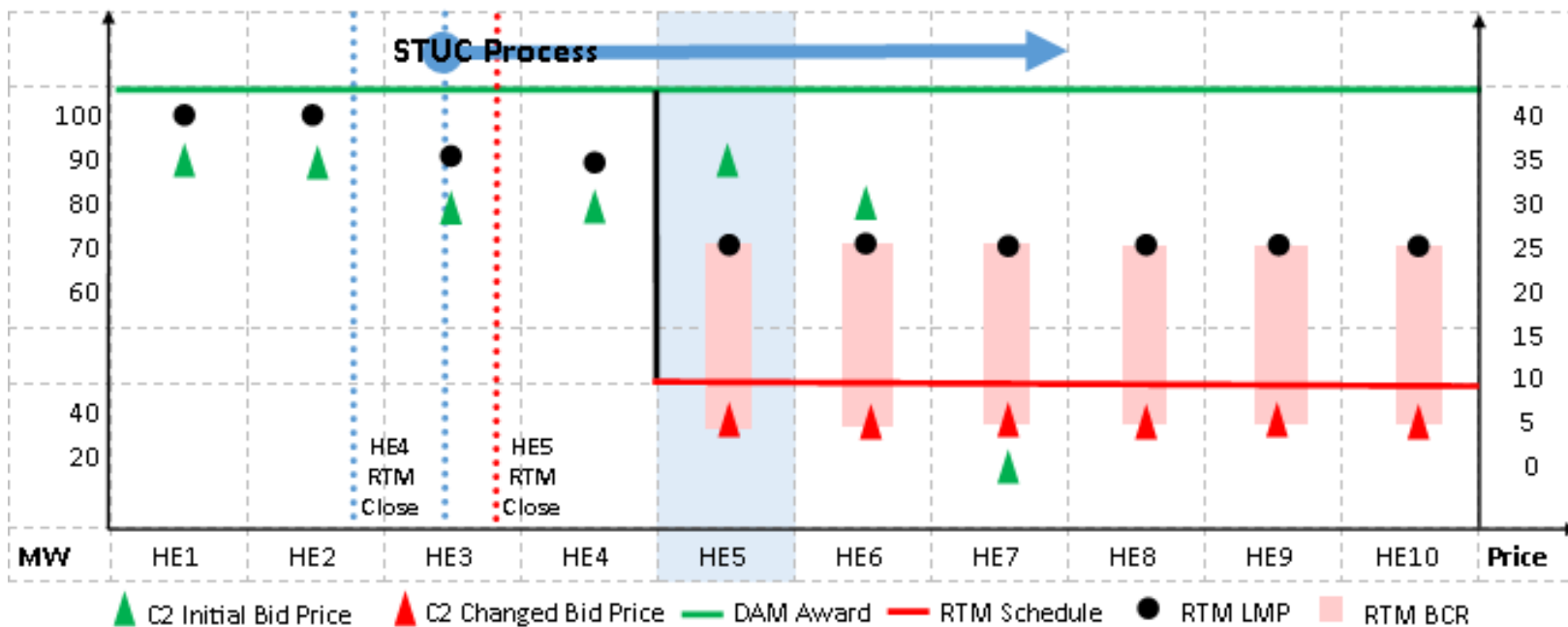
Changing bids after a commitment decision without an inter-temporal constraint

Resource	Min Gen	Max Gen	Start Up Time	Min Run Time	Start-up Fuel	Start-up Cost	Min Load Cost
GEN A	20	100	180	60	1,000 MMBtu	$10,000	$2,500
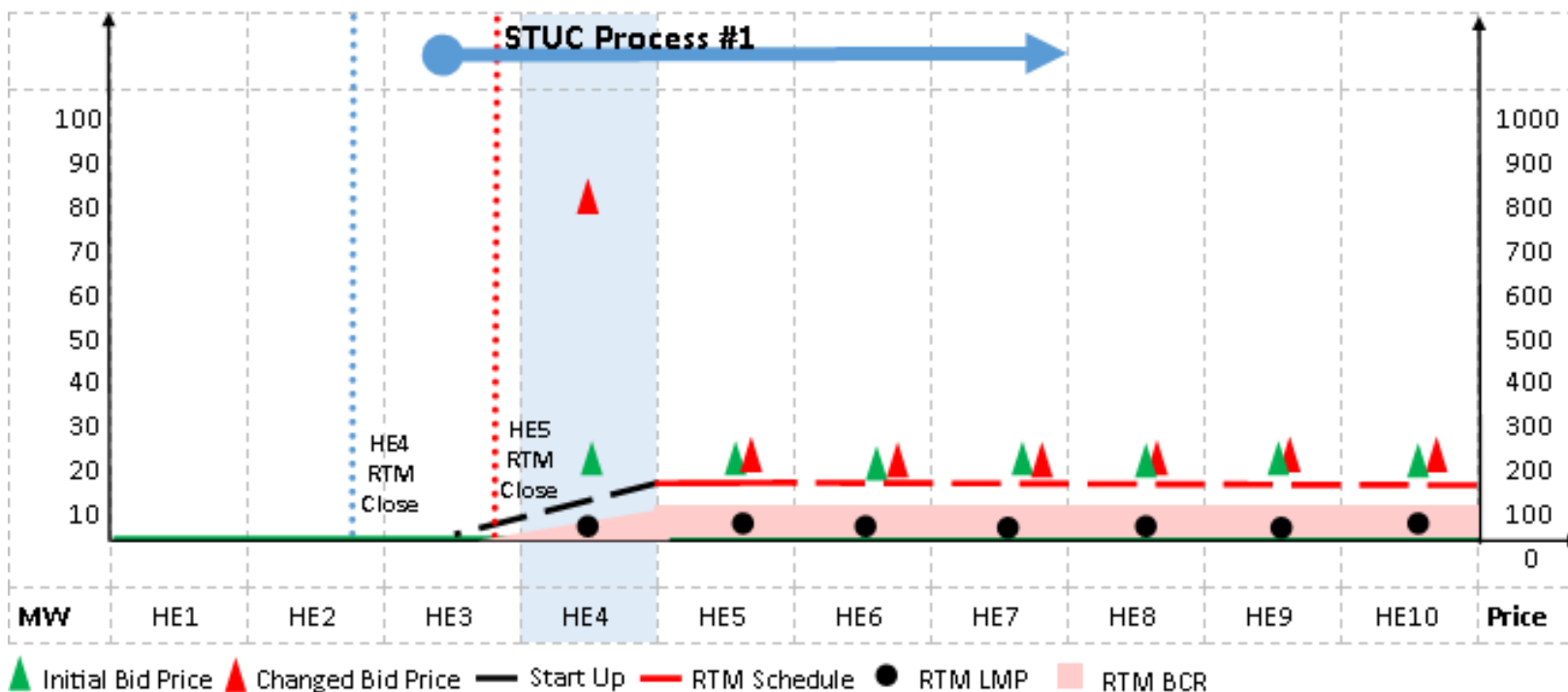
Market inefficiency concerns resulting from ISO's bidding flexibility rules

- Differences in bid prices may be used to legitimately reflect changing economics when the market optimization can respond to the new information.

- If a resource's bid prices are able to contribute to the market solution and the resource can respond to dispatch instructions, there is value in allowing flexibility to submit different RTM bid prices *albeit within a range of reasonableness*.

- If a resource's bid prices are not able to contribute to the market solution and cannot respond to dispatch instructions, there does not seem to be a reason to allow differences in bid prices between the initial and changed bids.

Exploring introducing restrictions to bidding flexibility

- The ISO seeks stakeholder input on the following potential designs for such a feature:

  – Introduce requirement for resources to submit by 10:45 PM before begin of the operating day a daily profile for its real-time market energy bids to establish a range for its energy bids intra-day.

    - Bid prices will be restricted to a given range around some measure. For example, all bids across the range could not increase or decrease by more than some percentage from the average bid price submitted across all segments.

    - Any changes to real-time market energy bids would be restricted to the range established by the initial daily bid profile

  – Restrict real-time market energy bids from varying by more than an established percentage from day-ahead market energy bids. For example, real-time market bid prices could not be less than or greater than 50 percent of day-ahead market bids.

The ISO seeks stakeholder input on what is an appropriate tradeoff between bidding flexibility and resolving these market inefficiencies.

Issue	Proposal, Option 1	Proposal, Option 2
Changing bids after a commitment decision during an inter-temporal constraint	Continue monitoring	Limit bidding flexibility
Changing bids after a commitment decision without inter-temporal constraints	Continue monitoring	Limit bidding flexibility

- Option 1: Continue monitoring for this behavior and consider resources significantly lowering bid prices in this situation to be engaging in market manipulation.

- Option 2: Introduce market feature limiting the energy bidding flexibility between market runs.

Next steps

- Stakeholders are asked to submit written comments by **December 17, 2015** to InitiativeComments@caiso.com

- Second Revised Straw Proposal and Draft Final Proposal for Section 7.2.1, *correct inefficient accounting for minimum load costs after a Pmin rerate*, *is planned to* post on January 5, 2016.

- Draft Final Proposal for the remainder of the *Bidding Rules Enhancements* initiative will be posted February 15, 2016.