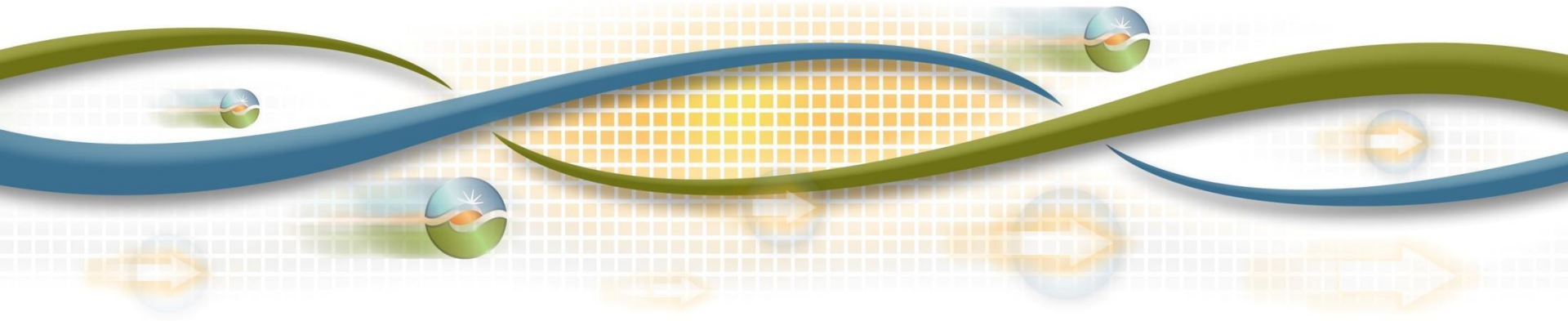# California ISO

Briefing on commitment costs and default energy bid enhancements (CCDEBE)

Lead, Cathleen Colbert

Sr. Market Design Policy Developer

Market Surveillance Committee Meeting

General Session

May 05, 2017

Discussion Overview

- Introduction

- ISO proposed principles

- Supply offer structure and bidding rules

- Cost based framework and validation

INTRODUCTION

Commitment Costs and Default Energy Bid Enhancements - Scope

- Initiative to address stakeholder concerns with ISO's market design features impacting bidding flexibility

- Goal: evaluate ISO's bidding flexibility design and assess whether modifications should be pursued

- Bidding Flexibility includes design features that:

  - Balance both:

    - Suppliers ability to bid economic prices reflecting their willingness to provide energy at a given price

    - Market's ability to protect against vulnerability

  - Ensure mitigated prices are reasonable reflections of suppliers' cost expectations

Stakeholder process result of stakeholder concerns with current bidding flexibility including

Production cost expectations may not be appropriately valued ➔

1. Limitations might exist due to commitment cost market power mitigation where commitment cost mitigation may be overly restrictive

2. Limitations might exist where the market power protections are insufficient where exceptional dispatch mitigation may not be restrictive enough

3. Limitations might exist due to reference level design for commitment costs and energy costs where reference levels exclude price impact of externalities

4. Limitations might exist due to reference level design for commitment costs reference levels may not reasonably reflect cost expectations

Stakeholder views expressed in stakeholder process

- Suppliers would like to:
  - Reflect varying levels of commitment costs across day through daily profile (different values for an hour across the day) of commitment costs especially for minimum load costs
  - Ability to update commitment costs in real-time to reflect changing fundamentals
  - Be able to bid supply offers lower than resource-specific cost based bids when Pmin re-rated and ISO adjusts cost estimate using DEB integration
  - Select hours to bid the entire supply offer
- Some stakeholders believe existing structure is robust for bidding practices and flexibility, only issue is need for minor adjustments to the fuel inputs used in reference levels
- Stakeholders want to know a proposed bidding structure before mitigation and validation can be designed.

California ISO

Bidding rules design with market based and cost based offers by component - Today

- **Variable cost** refers to costs that **vary with changes in MWH output** (hourly value)

- **Fixed cost** refers to **short-term fixed costs** for event-based commitment costs of a generating or non-generating resource incl. participating demand response (daily values)

- **Long-term fixed costs**, going forward fixed costs or overhead such as salaries while a cost of business are not short-term costs for power production but instead capacity costs.

Type	Sub-type	Market Based Offer	Cost Based Offer
Energy	Variable Cost	X	
MLC	Variable Cost		X
	Fixed Cost		
TC	Fixed Cost		X
SUC	Fixed Cost		X

California ISO

Non-exhaustive list of electricity market operators responsibility to operate the markets

- Support suppliers submitting market based offers if no market power concerns exist limited by "circuit breaker" offer cap
- Test for suppliers ability to adversely impact the market (increase energy prices or uplift payments)

CAISO only supports market based offers for the variable energy cost curve in the supply bids

Type	Sub-type	Market Based Offer	Cost Based Offer
Energy	Variable Cost	X	
MLC	Variable Cost		X
	Fixed Cost		
TC	Fixed Cost		X
SUC	Fixed Cost		X

Non-exhaustive list of electricity market operators responsibility to operate the markets

- Replace market based offers with cost based offers if potential to exercise market power is detected

- Validate and refer suspected artificial cost based offers to deter false or artificial offers inflating energy prices or uplift

CAISO uses capped commitment cost based offers ATC and replaces energy market based offer with default energy bids (mitigated price)

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

- Produce least cost, security constrained solution

ISO PROPOSED PRINCIPLES

Proposed principles under competitive conditions

- Bid structure and bidding rules should be designed to reduce barriers to entry to CAISO markets regardless of technology type (technology-agnostic approach)

- Competitive forces provide market power protection based on profit-maximizing incentives to bid supply offers based on suppliers' expectation of production costs

- Under competitive conditions, suppliers should be able to offer price at which they are willing to sell the good based on their asset valuation

  – Can include additional valuation of asset outside of its expected production costs such as monetized risks (e.g. "cash out")

  – Other factors that contribute to willingness to sell

- Resources without must-off-obligations should have flexibility to select hours to offer power within a day

California ISO

Proposed principles under uncompetitive conditions

- Market must protect consumers against exercise of market power and only mitigate when test shows potential to exercise market power

- Under uncompetitive conditions, supply offers should be mitigated to price levels that are a reasonable reflection of suppliers' cost expectations

  - When mitigated, suppliers should not be allowed to recover other factors, even if it contributes to their willingness to sell, due to market power concerns

  - Potentially monetized risks that result in negative reliability externalities might need to be priced to manage merit order based on needs

  - Currently do not see cause for monetized risks only impacting supplier to be included in cost formulation – cost of business

  - Could be different than incurred costs

ISO proposes following considerations for its cost based framework once mitigated

- Ensure design is compatible with various technologies so that they are able to participate within established model i.e. technology agnostic approach.
    - Gas units should be provided similar flexibility in estimating cost expectations as non-gas fired units ➔ both bid-in or both administratively calculated
    - Non-gas fired units should be provided similar flexibility to update their cost based offers as gas units ➔ daily versus subject to Master File approval
- Allow adjustments to cost based offers in market to capture changing fundamentals ➔ efficient dispatch and signals
- Allow avenue for cost recovery when rules restrict ability of supplier to bid cost expectations
- Do not support cost recovery when supplier's cost expectations were "wrong"

SUPPLY OFFER STRUCTURE AND BIDDING RULES

Options to enhance bidding rules with flexibility to resolving these issues

- Option 1: Maintain current bid structure design and re-bidding policy

- Option 2: Hourly Minimum Load Cost Component
  - Convert bid-in cost based MLC to an hourly component instead of a daily component to the supply offer bid

- Option 3: Hourly Bid Components for All 4 Components
  - Convert bid-in commitment cost components to hourly components instead of daily components

- Option 4: Hourly and Daily Minimum Load Energy Bid Components
  - Hourly component for costs due to MWH output associated with energy production up to minimum operating level i.e. MLE
  - Daily component for costs that do not fluctuate based on energy output based instead are function of run hours

- Broad consensus that existing re-bidding rules are appropriate so following options maintain rebidding rules to allow resources without IFM or binding RUC start up to rebid until committed through MRT

Option 1 – Maintain current policy allowing changes outside of physical constraints and addresses market power abuse concern

Current Policy: Final bid used in STUC process (bid resulting in STUC commitment) locked until through minimum run time at which time the market will begin to use the changed bid price
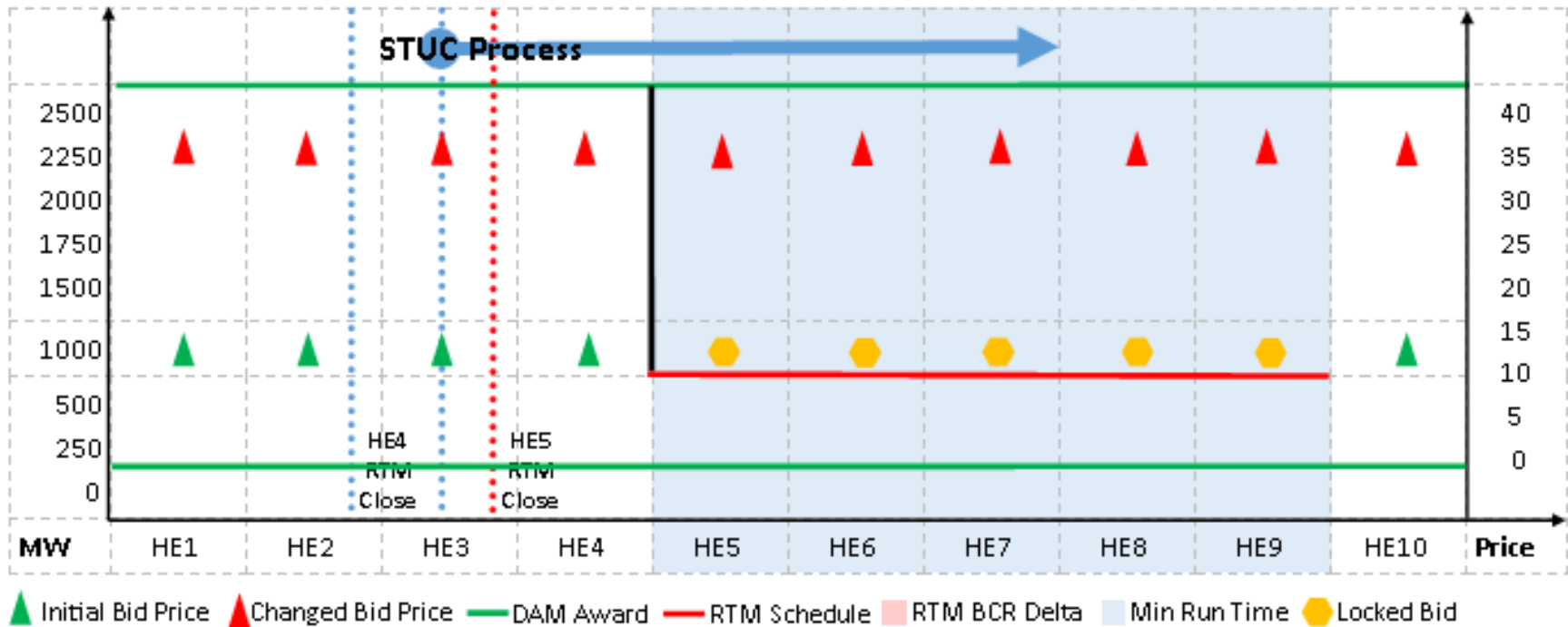
Note:
- Visual based on MLC structure design without hourly variation across day
- Static values for bid price is representing that the bid is for a daily component
- When bid price changes the prior market processes never used the updated value

Option 2 – hourly minimum load cost component cont.

- Bids continue to include one component for cost associated with operating at minimum operating level

- Change the bid component to an hourly type that would allow suppliers to bid MLC at various levels across day

- Hourly component – one value that combines variable costs associated with MWH production with short-term fixed costs for operating at run hour (idling), e.g.:

  - Maintenance adders

  - Auxiliary costs

  - Fuel cost proxy for MWH under the Pmin curve

Option 2 – hourly minimum load cost component cont.

Submitted value was higher, systems locked it

Revising bid-in market based offer for MLC to an hourly component would allow for the values to vary across hours as shown by hourly bids
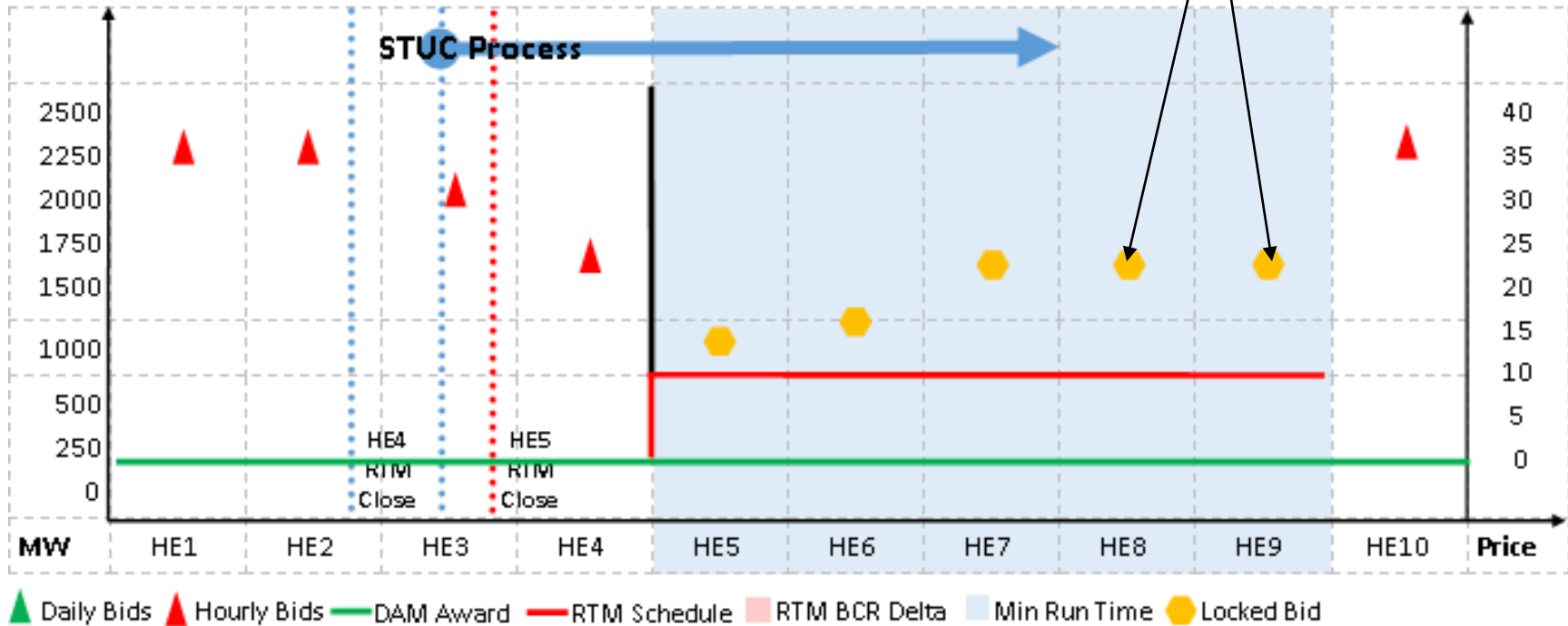
Daily Bids ▲ Hourly Bids ━ DAM Award ━ RTM Schedule ▮ RTM BCR Delta ▮ Min Run Time ⬡ Locked Bid

Maintain recently implemented policy that allows rebidding of commitment costs for units without IFM schedules or binding RUC start-up instructions until committed and then the value is locked until it completes its minimum run-time.

California ISO

Option 3: Hourly Bid Components for all 4 Components

- Allow greater control selecting hours to bid its resource would be resolved through introducing hourly components for all of the supply offers

- ISO still unclear whether stakeholders are voicing need for design that does one or both of the following:
  - Supports various values for each hour
  - Supports various values for each hour for the minimum load component and while supporting hourly selection for start up and transition costs would require equal values for each hour
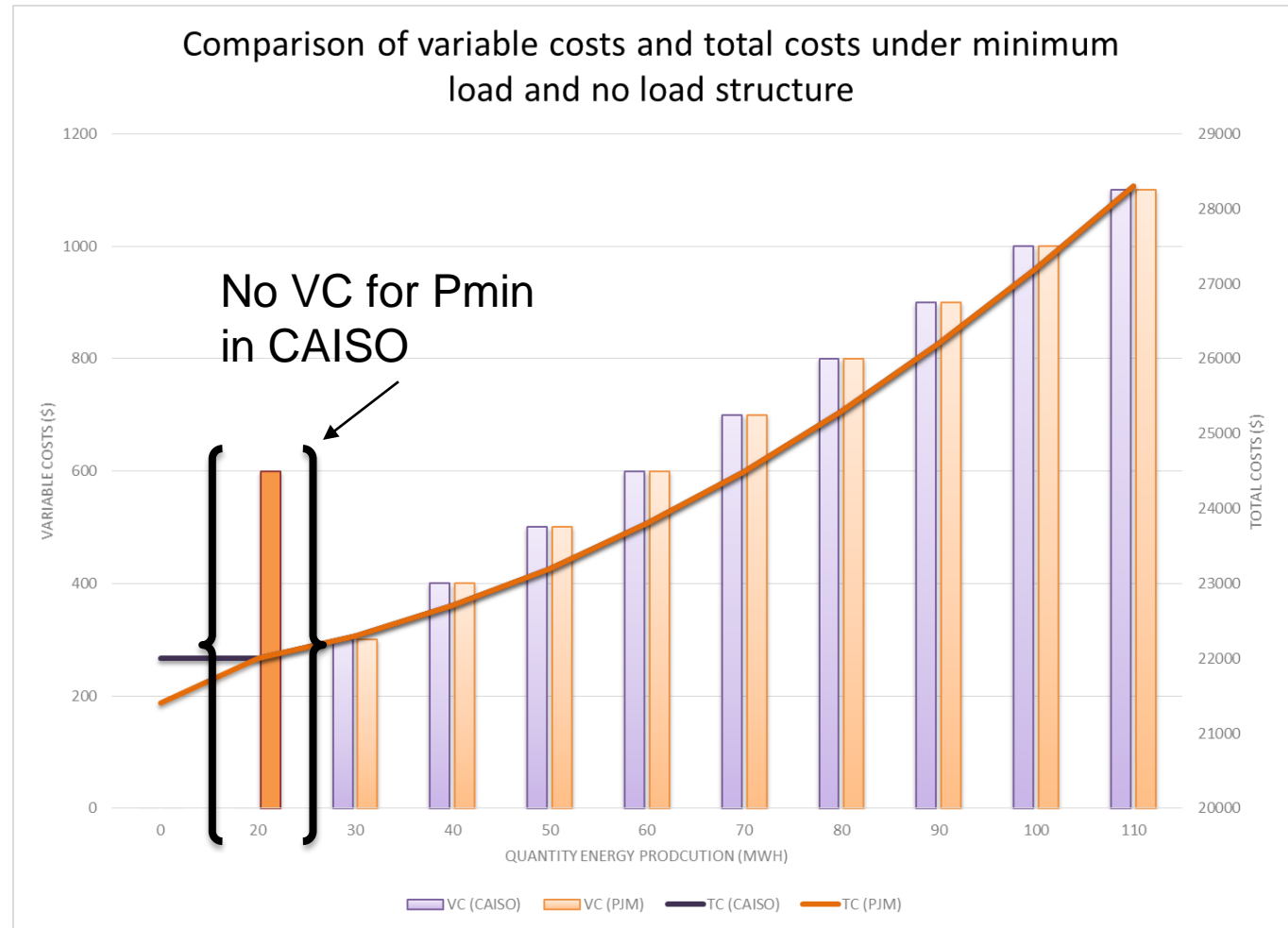
Option 4 – hourly and daily minimum load energy bid components cont.

- Bids include two components for cost associated with operating at minimum operating level (Pmin,MLE)

- Daily component – fixed costs associated with a run hour, eg:
  - Maintenance adders   Costs are at 0 MW output
  - Auxiliary costs

- Hourly component – costs associated with MWH production costs, eg:
  - Fuel cost proxy for MWH under the Pmin curve

Hourly component treats MWH output up to Pmin as variable for bidding but not for setting LMPs

- Views MWH production costs as variable

- Allows separate bidding for variable costs from fixed costs at Pmin

- SCUC integrates variable and fixed costs

- SCED sets LMP using incremental energy offers above Pmin

Comparison of variable costs and total costs under minimum load and no load structure

No VC for Pmin in CAISO

VARIABLE COSTS ($) / TOTAL COSTS ($)

QUANTITY ENERGY PRODCUTION (MWH)

VC (CAISO) VC (PJM) TC (CAISO) TC (PJM)

Option 4 – hourly and daily minimum load energy bid components cont.

Submitted value was higher, systems locked it

Revising bid-in market based offer for MLC to an hourly component for the minimum load energy MWH production costs and a daily component for the event-based costs (e.g. aux costs and MMA)
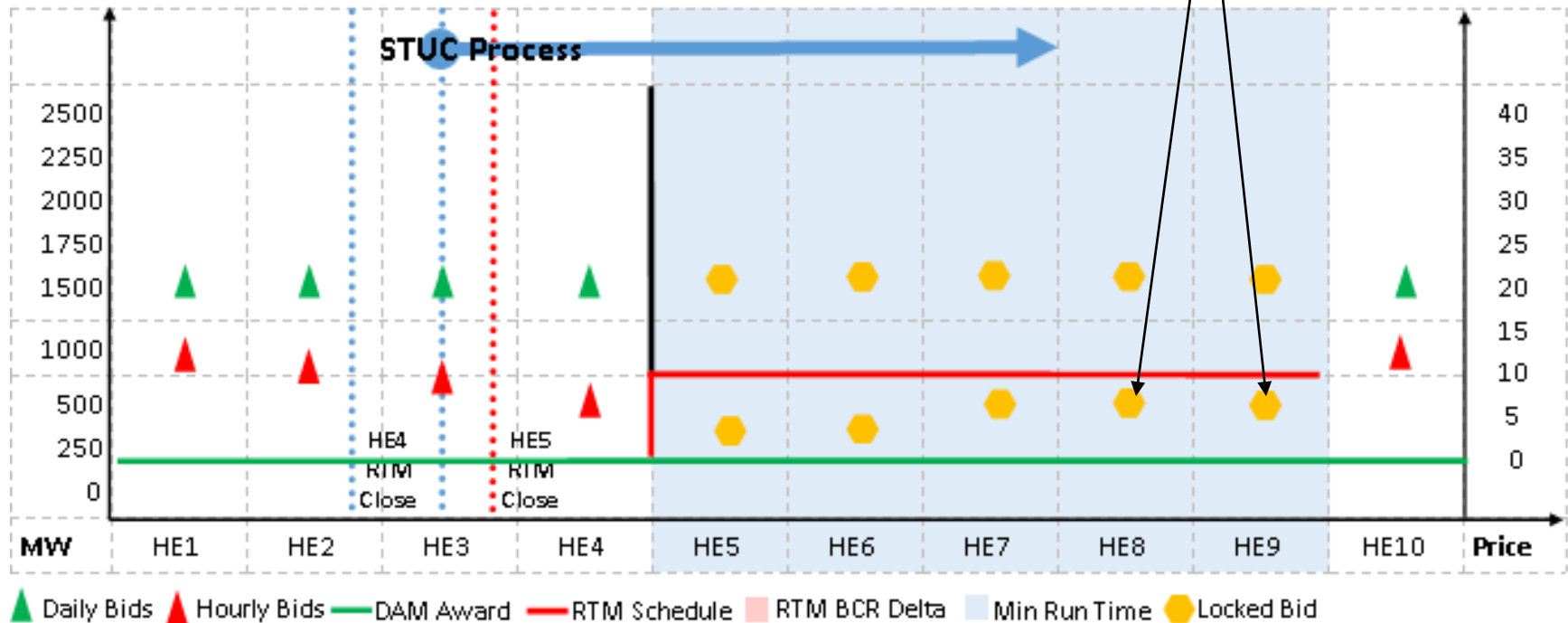
Maintain recently implemented policy that allows rebidding of commitment costs for units without IFM schedules or binding RUC start-up instructions until committed and then the value is locked until it completes its minimum run-time.

COST BASED FRAMEWORK AND VALIDATION

Issue that mitigated price or maximum commitment cost level may not reasonably reflect cost expectations

- Stakeholders expressed there are several limitations that may result in not reflecting their cost expectations for a unit

- Limitations could impose a larger price risk on the supplier to potentially incur losses than the supplier would have been willing to assume

- Some stakeholders communicated that they have seen mitigated prices or maximum commitment cost levels that did not adequately reflect their incremental production costs

  – Overly restrictive commitment cost bid caps

  – Undervalued default energy bids

Overview of CAISO cost based framework

- Cost based offers include:
  - Mitigated energy price
  - Maximum allowable minimum load cost
  - Maximum allowable start up cost
  - Maximum allowable transition cost
- Current bid cap level chosen because ISO believes it cover a majority of likely instances but acknowledged that it was not designed to support extreme occurrences
- New provisions providing an after-the-fact cost recovery for commitment costs exceeding bid cap due to marginal fuel procurement costs through extending 205 filing right at FERC approved at FERC.
  - Intended only for extreme, unpredictable events

Overview of other organized markets' cost based framework

- MISO, NYISO, ISO-NE calculate reference level values to replace market based energy offer
  - Some allow types of risk margins
  - All allow fuel price adjustments or "updates" to fuel input
- PJM and SPP allow suppliers to bid cost based offers to replace the market based energy offer:
  - Separate bid-in market based and cost-based supply offers where mitigated to bid-in cost based supply offer
  - Ex ante validation performed through approving fuel cost policy and requiring development of cost based offers per guidelines
  - Market monitoring units screen ex post bid-in cost based offers for deviations from guidelines and fuel policy
  - Any deviations or rule violations referred to FERC
- Some support uplift recalculation for actual costs above caps

California ISO

What costs should the ISO limit cost based offers to?

Starts/Transitions ($/start)	Run Hours ($/hour)	Minimum Load Energy ($/MWh)	Incremental Energy ($/MWh)

• Start-Up Fuel Costs
  • Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
  • Fuel Replacement Costs
  • Risk Margin for non-compliance with OFOs
• Start-up Auxiliary Costs
• GMC
• GHG
• Major Maintenance Adder
• OC (starts limitations)
• Other costs for moving into mode to provide energy output?
	• Major Maintenance
	• Service Agreements
	• OC (run hour limitations)
	• Other hourly costs for a run hour not result of energy production?
		• Minimum Load Energy Fuel Cost
		  • Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
		  • Fuel Replacement Costs
		  • Risk Margin for non-compliance with OFOs
		• VOM
		• GMC
		• GHG
		• DEBA
		• OC (output limitations)
		• Other costs for providing power output?
			• Segment's Fuel Cost
			  • Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
			  • Fuel Replacement Costs
			  • Risk Margin for non-compliance with OFOs
			• VOM
			• GMC
			• GHG
			• DEBA
			• OC (output limitations)
			• Other costs for providing power output?

California ISO

CAISO view of bid-in cost based approach

Advantages:

- Sufficient flexibility for relevant cost inclusion
- SC registers cost values based on relevant costs which could factor in more complex cases such as:
  - Need to balance gas-electric rules
  - Blend of fuel costs for fuel switching
  - Blend of procurement locations
  - Blend of shipping rates
  - Expected delivered gas price (forecasting with awareness of multiple gas days)
  - Need storage opportunity costs

Disadvantages:

- Limited control on cost components and no control on data inputs
- Restricted to MF approval timeline (up to one week turn around)
  - Forces use of forecasting and would include risks due to cost uncertainty
  - Not able to update expectations with more timely information not

California ISO

CAISO view of reference levels approach

Advantages:

- Delivered gas price information updated daily

- Allows control of the cost components and data inputs

Disadvantages:

- Limited flexibility for relevant cost inclusion

- Potentially overly restrictive assumptions include:

  – No need to balance gas-electric rules

  – One Fuel Type per Unit

  – One Procurement Location

  – One Shipper

  – One Price as Proxy

  – Next Day Price as Proxy

  – Suppliers weigh storage opportunity costs

California ISO