Commitment Costs and Default Energy Bid Enhancements – Revised Straw Proposal and Technical Workshop

August 3, 2017

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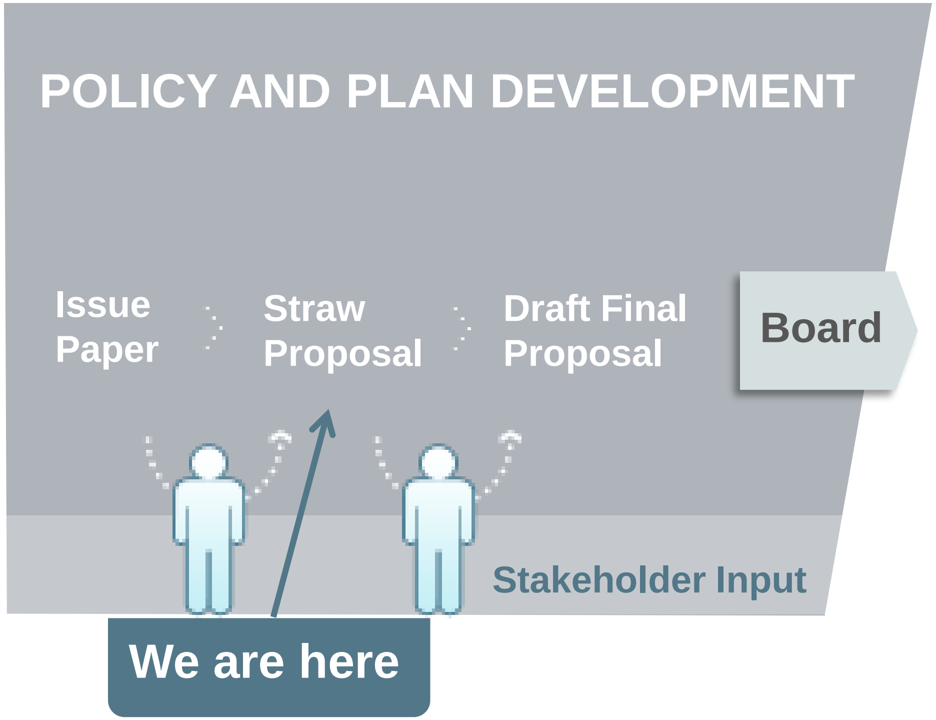
Market and Infrastructure Policy

August 3 working group agenda

Time	Topic	Presenter
9:00 – 9:05	Welcome	Kimberli Perez
9:05 – 9:10	Introduction	Brittany Dean
9:10 – 9:50	CAISO responses to stakeholder comments on straw proposal	Brittany Dean
9:50 – 10:00	Break	
10:10 – 12:00	Mitigation • Review design principles • Technical Discussion	Brittany Dean Cathleen Colbert
12:00-1:00	Lunch	
1:00 – 3:55	Supplier submitted ex ante adjustments • Review design principles • Technical Discussion	Cathleen Colbert
3:55 – 4:00	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 written comments due	August 10, 2017
Draft final proposal posted	August 18, 2017
Stakeholder call	August 30, 2017
Stakeholder written comments due	September 11, 2017
EIM governing body meeting	October 10, 2017
Board of Governors meeting	November 1-2, 2017

Expectations

- Opportunity to discuss stakeholder comments on straw proposal and CAISO's initial responses
  - Encourage collaborative feedback on CAISO understanding
- Opportunity for CAISO to clarify details underlying proposal
  - Encourage questions throughout discussion
- Encourage collaborative participation in the room
- Phones will not be open for participation during sessions
  - Submit questions via email to kperez@caiso.com
  - Will open phones at end of agenda items

EIM Categorization

- This initiative will affect the real-time market
- The EIM is an extension to the real-time market
- This initiative is EIM related
- EIM Governing Body – E2 classification (Advisory)

  "For a policy initiative proposing changes to generally applicable real-time market rules or rules that apply to all ISO markets, the matter goes to the Board for approval; however, the EIM Governing Body has the option to provide advisory input."

http://www.caiso.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf

INTRODUCTION

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	X	Mitigated Proxy Cost
		Fixed Cost		
Daily	TC	Fixed Cost	X	Mitigated Proxy Cost
Daily	SUC	Fixed Cost	X	Mitigated Proxy Cost

CAISO RESPONSES TO STAKEHOLDER COMMENTS ON STRAW PROPOSAL

Propose to support hourly minimum load offers

- **DMM, EDF, NV Energy, NRG, OhmConnect, WPTF, Six Cities, PGE, APS, Idaho Power Corporation, PacifiCorp, Puget Sound Energy, Powerex, Seattle City Light, and NV Energy** generally support
  - Generally stated: improves non-RA and EIM participation and increases market efficiency by better reflecting resources value
  - **OhmConnect**: this will provide valuable flexibility to Proxy Demand Resources and facilitate their participation
  - **DMM and PG&E** is concerned about supplier gaming during STUC process with locking in the last bid at higher levels
- **No opposition**

The ISO changed it's straw proposal based on Stakeholder feedback to using an average of a supplier's MLC bid during the RTUC process that resulted in the binding unit commitment. This will avoid potential gaming concerns.

Propose to apply settlement rules when no minimum load cost offer present

- **NRG supported**
- **DMM, WPTF, NV Energy, and PG&E** oppose to treat the hour as a self-commitment period when minimum load bid is not present
  - **WPTF, NV Energy, PG&E**: if an SC does not offer in particular hours, that should be an indication of their intent to not commit in these hours (i.e. uncomfortable w/ confusion on rules)
  - **WPTF** recommend changing the proposal to settle resources based on its proxy costs.

The ISO has changed the proposal to settle BCR based on the resources proxy costs. If a resource is committed within the optimization window, the resource will likely have sufficient time to update its market-based bids for any hours missing offers but if not will not be overly restricted in cost recovery by settling at cost.

Propose to add a negotiated option for proxy costs

- **DMM, PG&E, Six Cities, EDF, NRG, NV Energy, PGE, APS, Idaho Power Corporation, PacifiCorp, Puget Sound Energy, and Seattle City Light** broadly support a negotiated proxy cost option
  - **EDF**: "…a step in the right direction, allowing suppliers' cost expectations to be more accurately reflected in CAISO's markets"
  - **Powerex, NRG, and NV Energy**: supports expanding negotiated option, but requests more clarification on process and policy interactions
    - BRE DEB Integration and CCE3 OC Adders
  - **DMM**: CAISO should identify all cost components that can be considered for inclusion in resource's negotiated commitment costs
- **No opposition**

CAISO did not make any changes to its proposal. CAISO clarifies that at a minimum, the negotiation would include the cost components included in the CAISO's existing proxy commitment cost estimates. Above that, resource-specific negotiated costs will be dependent on that resource and their unique circumstances.

When should fuel replacement cost be considered in reference levels

- **Six Cities and NRG** supports the proposal to allow greater flexibility in estimating fuel replacement cost in reference level calculations.
  - There may be variation in fuel procurement policies and practices. The component should be includable in negotiated DEB and proxy costs.
- CAISO did not change its proposal. Any variations on fuel replacement cost estimate should be addressed in negotiation process.
- For purpose of its non-negotiated proxy costs and DEBs, CAISO maintains the appropriate value for establishing a benchmark for fuel replacement costs is at prevailing market price (i.e next day index)
- CAISO recognizes select resources may be able to justify different approaches to estimating fuel replacement costs based on their unique circumstances – necessitating a negotiated proxy cost/DEB

Propose to allow supplier to provided ex ante reference levels adjustments subject to ex ante verification

- **DMM, PG&E, EDF, NRG, NV Energy, Six Cities, WPTF, PGE, APS, Idaho Power Corporation, PacifiCorp, Puget Sound Energy, and Seattle City Light** generally support the proposal
  - **PGE, NV Energy, Seattle City Light**: gives suppliers flexibility to reflect cost expectations and will improve market participation; especially important for those without MBRA
  - **PG&E**: generally supportive, but wants process of determining thresholds to be transparent, and recommends not providing additional bid headroom (↓125%/110%) given adjustments
  - **DMM and PG&E**: guidelines should be thorough and vetted
  - **EDF, PG&E, SCE**: Request CAISO provide a broad set of criteria, avoid a highly prescriptive approach
  - **Six Cities**: requests examples illustrating how CAISO would propose to evaluate requests for adjustments and hold a workshop to work through examples

Propose to allow supplier to provided ex ante reference levels adjustments subject to ex ante verification (continued)

  - **EDF, PG&E, SCE**: Request CAISO provide a broad set of criteria, avoid a highly prescriptive approach
  - **Six Cities**: requests examples illustrating how CAISO would propose to evaluate requests for adjustments and hold a workshop to work through examples
- **Six Cites, Seattle City Light:** Proposal unclear on if non-gas units will have guidelines for conditions warranting adjustments
- **No opposition**

CAISO will continue path to establish gas and non-gas guidelines for reference levels. Greater detail is provided in technical Appendix C of the Revised Straw Proposal. Exact values will be non-transparent due to gaming concerns. Non-gas reasonableness thresholds will use existing methodology, but will using CAISO's fuel regions.

Propose to verify reference level adjustments in an ex post review process

- **NV Energy, NRG, EDF, PG&E, Six Cities** generally support the proposal to verify reference level adjustments in an ex post review process
  - **NV Energy**: Reference level adjustment process with ex post verification is a significant enhancement from the requirement to file at FERC under all circumstances
  - **Six Cities**: requests more information on how CAISO will develop and apply ex post verification, especially what types of documentation will be needed for reference level adjustments
- **No stakeholders** oppose verifying reference level adjustments in an ex post review process

CAISO did not change its proposal. Process details will be explained in today's workshop.

Contemplating to propose to perform audit on SCs use of ex ante verified adjustments potentially result in clawback of market payments

- **NV Energy, NRG, PG&E, and WPTF** generally support the proposal to allow clawbacks
  - **PG&E**: CAISO's authority to monitor use of adjustment tool would incent suppliers to use the tool appropriately
- **Six Cities and NRG** oppose the proposal to clawbacks if CAISO determines adjustments are based on artificial information since it creates uncertainty for suppliers and may discourage voluntary market participation. Why would this be needed if bids go through ex post verification?

CAISO made a minor change to its proposal. CAISO will also seek authority to render ineligible temporarily and to impose penalties on any Scheduling Coordinator who submits inaccurate fuel price or fuel type that was biased in the favor of the Market Participant .The authority to monitor and Clawback is essential as it will be an additional measure needed to protect against artificial price impact.

Propose to introduce mitigation for commitment cost components

- **NV Energy, SCE, Seattle City Light, WPTF and Six Cities** support the proposal to introduce mitigation for commitment cost components
  - **Seattle City Light**: dynamic MPM that limits mitigation period to as few intervals as possible **SCE, EDF, WPTF**: CAISO should not move parts of the MPM redesign into Real-Time Enhancements
- **PG&E neither supports or opposes but prefers no action**: Concerned about how mitigation will change with upcoming Real-Time enhancements. Feels mitigation can be left out of the scope of CCDEBE
- **DMM** oppose the proposal to introduce mitigation for commitment cost components and will not support increases in bid caps unless the proposal more clearly defines methodology

CAISO did not change its proposal. Methodology is provided technical Appendix D of the revised straw proposal and will be discussed further today.

Propose to cap market-based commitment cost components at 300% of mitigated proxy costs

- **SCE, EDF, Six Cities, and DMM** support applying a cap but question the specific level
  - **SCE** generally support the proposal to cap commitment costs where cap should exclude any penalties by not including in reference levels
  - **EDF and Six Cities:** seek clarification on why 300% was chosen
- **NV Energy** opposes the proposal to cap commitment costs since they view cap as unnecessary given mitigation. If mitigation is not working, CAISO should suspend market based CC bids instead of capping all the time.

CAISO did not change the proposal. The percentage amount was selected based off of conduct test levels in other organized markets generally adopting 200-300% for test.

Propose to reflect risk margin or scarcity pricing for risk of non-compliance with gas rules

- **Six Cities, NRG, and EDF** support to include non-compliance risk as a cost component of reference level calculations or submitted ex ante adjustments to reference level calculations.
  - Generally, they believe that suppliers need to be able to recover unavoidable costs triggered by CAISO dispatch whether through the market or ex post uplift
  - **NRG**: “market price should always reflect reliability needs and must also reflect costs incurred to meet those needs” (specific to non-compliance charges)
- **PG&E, SCE, DMM** oppose including non-compliance risk as cost component in reference level calculations or verifiable ex ante adjustments (select stakeholders would support after-the-fact)

Propose to reflect risk margin or scarcity pricing for risk of non-compliance with gas rules (continued)

- **DMM**: Requests clarification on what criteria would be accepted for submitting adjustment requests as components of reference levels. Other tools available that deal directly with reliability issues that don’t result in price setting based on penalties from other markets.
- **PG&E and SCE**: Oppose including costs in bids and reference levels that could impact price since it does not incent generators to avoid such penalties.
  - Would be supportive of ex post cost recovery if the ex post verification mechanism verifies risk of incurring OFO non-compliance charges incurred after 4pm PT and before midnight due to CAISO dispatches after ID3 closes

CAISO did not change its proposal. Propose policy did not add new component to reference level calculations consistent with PG&E, SCE, and DMM comments. Proposal allows for ex ante adjustments that could reflect risk of non-compliance for adjustments after 4PM TD. These requests would likely not be verifiable prior to market run, but instead recoverable – **if verified** – ex post.

WORKSHOP - MITIGATION

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

Propose 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)			
RSI calculation – allows commitment/de-commitments	Y, changes to 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)		
Mitigation Criterion	Net effect of commitment on congestion system-wide			

Propose adding second RSI calculation

- Determine two separate RSI for two separate sets of constraints
- Determine potentially pivotal supplier (PPS) test differently
- Change treatment to include impact of minimum operating level to capture ability to shutdown or be de-committed

Propose adding second RSI calculation – review changes from energy mitigation calculations

- Second residual supply index (RSI) calculation
- Withheld Capacity (WC) at affiliate portfolio level (J)
- Supply of Counter Flow (SCF) from potentially pivotal suppliers
- Supply of Counterflow (SCF) from fringe competitive suppliers
- Demand for Counterflow (DCF)

Propose changes to applying mitigation

- If energy mitigation criterion at resource is met ➔ entire three-part bid would be mitigated
- If commitment cost mitigation criterion at resources is met ➔ mitigate commitment cost components to reference level for each component (proxy cost * 110%)
- Will apply mitigation differently for starts/transition costs and minimum load costs

WORKSHOP – SUPPLIER SUBMITTED EX ANTE ADJUSTMENTS

Review of design principles

Proposed principles under uncompetitive conditions – reference level design

- Market produces efficient dispatch solution and price signals when suppliers offers are reasonable reflections of the suppliers' cost expectations

- Suppliers' offers must only be mitigated to price levels that are reasonable reflection of their cost expectations

- When mitigated, suppliers' reference levels should:
  - Not be able to value assets based on monetized risks, subsidies, contracts, or other factors
  - Suppliers should have ability to reflect fuel availability through a risk margin or scarcity value **as an exception** so the CAISO and supplier can avoid affecting reliability

Proposed principles under uncompetitive conditions – reference level design cont.

- Gas and non-gas units with unique cost methods should be able to negotiate both cost estimate methodologies

- Gas and non-gas units should be able to request reference level adjustments to reflect volatility

- Market should validate reference level adjustment prior to market run for purposes of setting LMPs (ex ante)

- Market should validate reference level adjustment after market run for purposes of uplift resettlement if verifiable through more thorough, documentation review (ex post)

Proposed principles under uncompetitive conditions – reference level design cont.

- Ex ante and ex post validation methods should screen against artificial price impact not suppliers' ability to predict actual costs
  - Uncertainty at time submitted so must be based on expectations
  - Expectations may differ from actual costs once realized

- Ex post cost recovery if adjusted reference levels cannot be validated prior to market run
  - Not avenue for recovery for bids with "wrong" expectations
  - Avenue for recovery when ISO validation thresholds (or cost caps) did not effectively capture adjustments that are reasonable

Design proposal to allow supplier submitted ex ante adjustment requests subject to verification

Propose to allow supplier provided ex ante adjustments subject to verification requirements

- Allow suppliers to provide ex ante adjustments to either DEBs, NDEBs, proxy costs, or negotiated proxy costs
- Adjustments may allow supplier to reflect gas system limitations or scarcity in bids to improve dispatch
- Address need to reflect changes to fundamental drivers
- DEB or NDEB adjustments will comply with Order 831

Propose to allow supplier provided ex ante adjustments subject to verification requirements cont.

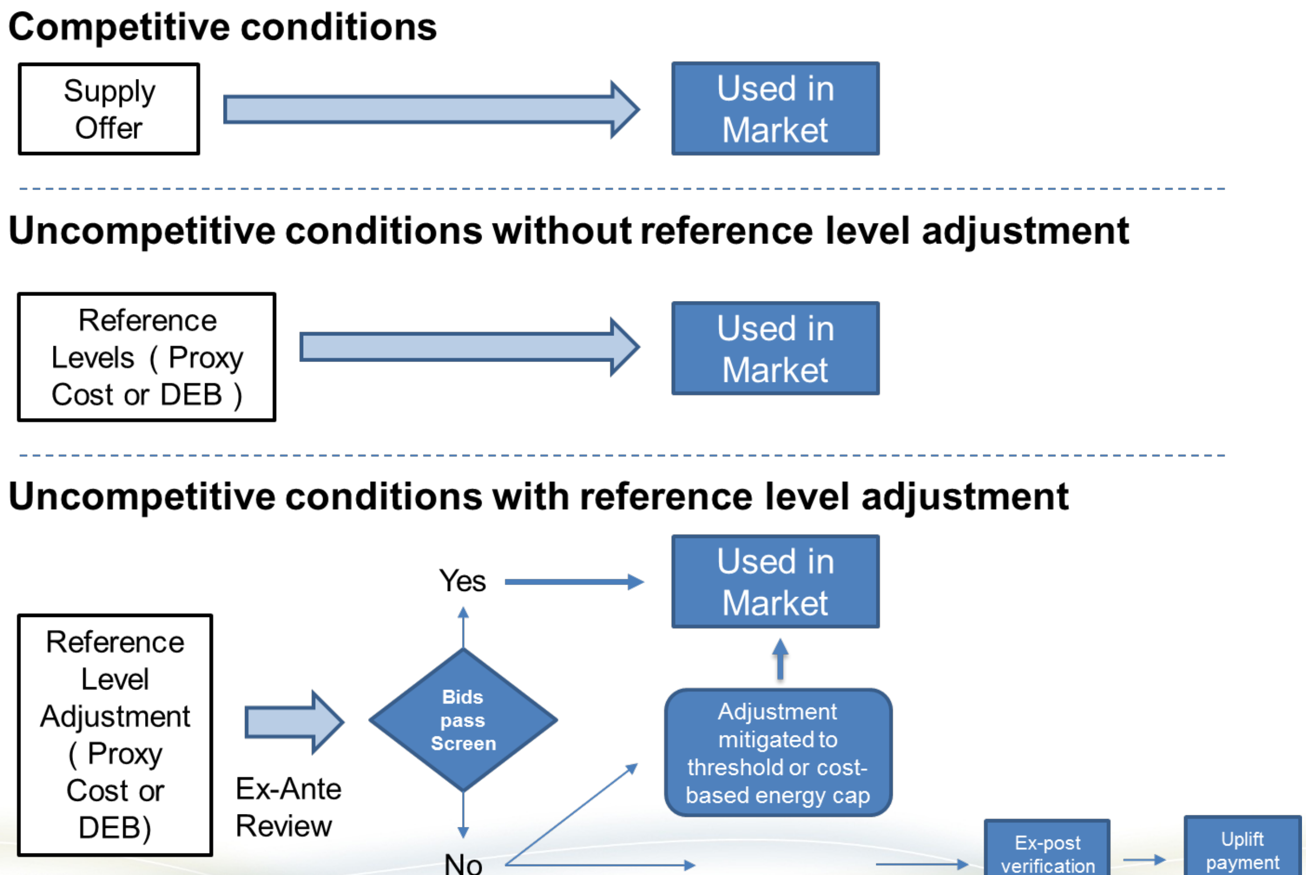
- Develop and verify according to established guidelines
- Verify ex ante using automated validation
- Enforce hard cap to energy component at $2,000/MW
- Ex ante verified adjustments above $1,000/MWh and up to $2,000/MWh can set prices

Proposal requires new process

Process flow for discussion located at:

http://www.caiso.com/Documents/ProcessFlow-CommitmentCosts_DefaultEnergyBidEnhancements.pdf

Illustrative visual of process flow displayed in CAISO white papers:



Proposal requires cost development guidelines

- Black – reflects components in current calculations
- Purple – reflects fuel cost equivalent for non-gas in MF
- Blue – reflects eligible to pursue in negotiated options
- Red – reflects eligible for inclusion in adjustment requests not standard reference levels
- Green – reflects impending implementation (CCE3)

Propose to create cost development guidelines cont.

Start Up

Starts/Transitions ($/start)

- Start-Up Fuel Costs
  - Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
  - Other costs for moving into mode to provide energy output
  - Fuel Replacement Costs
  - Risk Margin for non-compliance with OFOs
- Start-up Auxiliary Costs
- GMC
- GHG
- Major Maintenance Adder
- OC (starts limitations)

Minimum Load

Run Hours ($/hour)

- Major Maintenance
- Other costs for providing power output
- OC (run hour limitations)

Minimum Load Energy ($/MWh)

- Minimum Load Energy Fuel Cost
  - Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
  - Other costs for providing power output
  - Fuel Replacement Costs
  - Risk Margin for non-compliance with OFOs
- VOM
- GMC
- GHG
- DEBA
- OC (output limitations)

Energy Output

Incremental Energy ($/MWh)

- Segment’s Fuel Cost
  - Delivered Fuel Price (commodity, transport, miscellaneous fees including taxes, shrinkage rate, and cap-and-trade credits)
  - Other costs for providing power output
  - Fuel Replacement Costs
  - Risk Margin for non-compliance with OFOs
- VOM
- GMC
- GHG
- DEBA
- OC (output limitations)

NEXT STEPS

Plan for stakeholder engagement

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