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Forward Enhanced Reserves Market

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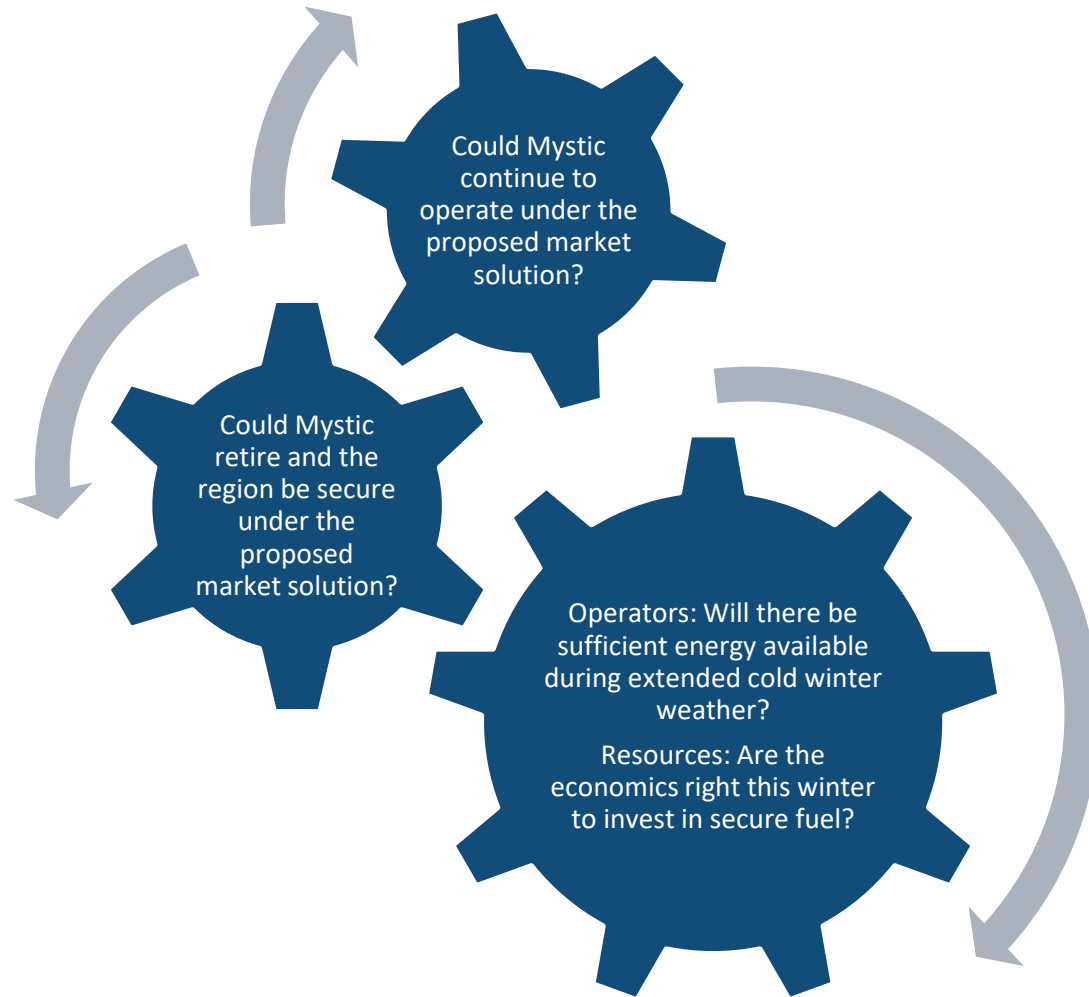
Agenda

- Calpine's Position on ISO-NE's Proposal for Energy Security Improvements
- FERM Recap
 - Market Fundamentals
 - Questions from Summer Markets Committee
- FERM Draft Tariff Language Framework

Calpine's Position on ISO-NE's Proposal for Energy Security Improvements

- ISO-NE's Chapter 3 Market Design now appears to address a different problem, namely one that is concerned with securing MWhs to meet energy and load forecasts throughout the year and replacement energy during real-time reserve shortages.
- Calpine is in favor of co-optimization of reserves in the day ahead market, but would prefer a proposal that simply increased physical reserves and carried that constraint into real time. This method would actually protect Real-Time price formation and avoid us compounding the problem of early retirement of fuel secure resources.
- The call option format is a novel design that we may be able to support, but in its current form, we believe there are serious concerns without specific modifications to Replacement Energy Reserves (RER) and clarifications on Energy Imbalance Reserves' (EIR) impact on the Reserve Adequacy Analysis done after the Day Ahead Market close.
 - Without linking the EIR options to a physical commitment, load is paying for the imbalance twice.
 - The ISO needs to increase RER reserves in real-time to match what they bought in RER day-ahead options to protect price formation and provide any reliability benefit.

Unanswered Questions to Solve for in a Winter Market Solution



The Forward Enhanced Reserves Market (FERM) allows resources to compete and markets to produce cost efficient solutions for winter fuel security

Market Design Fundamentals

- The Forward Enhanced Reserves Market (FERM) procures fuel secure MWh for winter period December 1st - March 15th three years prior to the obligation year.
- ISO qualifies resources based on their ability to contract for stored fuel or readily use stored energy¹.
- Suppliers submit offers into the auction for a maximum amount of MWh they will commit over the winter months to offer on stored fuel upon alert of an Operating Procedure-21 Energy Emergency Event.
- Suppliers with a FERM obligation will be required to offer on the qualifying fuel source in the Day-Ahead and Real-Time Energy Markets during an Energy Emergency or will be subject to penalty.
- If under the Energy Emergency a resource is dispatched for a FERM commitment, the MWh provided in the Energy Emergency will count towards its total FERM obligation.
- ISO will track the MWh for a FERM commitment.

1. Stored fuel is used throughout the presentation, but is meant to imply stored fuel or energy.

Questions from Summer Markets Committee

- *Who participates in the FERM replacement auctions?*
 - Given the nature of the FERM auction clearing for megawatts and megawatt-hours against a demand curve, the ISO will participate on behalf of load in the FERM replacement auctions.
 - Similar to the way Annual Reconfiguration Auctions are run for the FCA.
- *Is there a chance that total costs for FERM could increase after the primary FERM auction?*
 - If the ISO forecasted demand for FERM MWh increases a year prior and/or two months prior to the obligation, then yes, total costs of the program could increase.

Questions from Summer Markets Committee

- *Is there a level of Operating Procedure-21 (OP-21) that must occur to alert FERM resources to respond with offering on stored fuel?*
 - OP-21 collects fuel availability and environmental limitation information in order to
 - Forecast and report on expected energy availability over a 21-day look ahead
 - Declare Energy Alerts and Energy Emergencies based on forecasted or Real-Time system conditions
 - Take appropriate action in anticipation of, or during, an Energy Alert or Emergency
 - Communicate with all gas delivery systems and market participants regarding the fuel availability and environmental limitations
 - There are four levels of Energy Emergency Forecast Alert Thresholds (FEEA), but Energy Alert and Energy Emergencies relate to
 - FEEA2 indicates that available resources during any hour of the Operating Day are forecasted to be less than those required to meet Operating Reserve requirements and that the implementation of OP-4 Actions 6-11 is being forecasted
 - FEEA3 indicates that the available resources during any hour of the Operating Day are forecasted to be insufficient to serve firm load requirements, and the implantation of firm load shedding under OP-7 is being forecasted
 - Energy Alert: FEEA2 or FEEA3 is forecasted to occur in at least 1 hour on 1 or more consecutive days in days 6 through 21 of 21 day energy assessment (or at the ISO COO determination)
 - Energy Emergency: FEEA2 or FEEA3 is forecasted to occur in at least 1 hour on 1 or more consecutive days in days 1 through 5 of the 21 day energy assessment (or at the ISO COO determination)

FERM resources will be obligated to offer on stored fuel under alert of Energy Emergencies

Questions from Summer Markets Committee

- *Will OP-21 forecast include the FERM MWh?*
 - FERM MWh would have to be included otherwise the system would always be in or near an OP-21 Energy Alert or Emergency
 - If ISO was to always count the total pool of FERM MWh then OP-21 tests may not accurately measure daily balance.
 - Calpine is looking for stakeholder feedback to better address this question.
 - One idea could be that the FERM MWh that are counted under OP-21 are limited to the total current balance of FERM MWh sold converted into fuel inventory excluding any replenishments or additional LNG calls.

Questions from Summer Markets Committee

How does the ISO decide when to use the FERM MWh especially the resources with limited inventory?

- Conservatively forecasting the amount of MWh needed in winter months to be supplied by FERM resources.
 - If the ISO purchases enough FERM MWh then management is not a problem.
 - Benefit of purchasing FERM MWh against a demand curve could result in excess MWh cleared.
 - Benefit of having one replacement FERM auction a year ahead and another two months ahead of the obligation months is ability to adjust forecast.
- ISO could actively update Opportunity Cost Bidding references during the winter.
 - Resources can efficiently price fuel inventories and cost to use into the market.
 - Translates anticipated future days' needs into current prices, and supports in-market posturing.
- After ISO has used up pool of diverse FERM MWh, rely on other programs in place, e.g. Pay-for-Performance.

FERM Draft Tariff Language Framework

- Calpine is taking the FERC granted time extension to spend more time on draft tariff language. Below is a preview of the section headers and description.
- III.9A Forward Enhanced Reserves Market
 - The ISO shall administer a Forward Enhanced Reserves Market (FERM) in accordance with the provisions of this Section III.9A. Market participation in FERM is voluntary.
- III.9A.1 Market Eligibility and Qualification
 - Technology Qualification and Contract Verification
- III.9A.2 Primary Auction
 - Auction Inputs and Demand Curve
- III.9A.3 Replacement Auctions
 - Two Replacement auctions administered by the ISO one year ahead and two months ahead of the obligation period
- III.9A.4 Rights and Obligations
 - Obligation during the winter months to offered off of stored fuel at alert of OP-21 Energy Emergency
- III.9A.7 Cost Allocation
 - Total net charges/credits to Real-Time Load Obligation for Net FERM Payments

APPENDIX

Slides from previous presentations for reference

WHAT IS THE ISO GETTING OUT OF THIS DESIGN?

- *Resources economically incented to provide stored fuel when the ISO needs it the most.*
- *Resources responding to the ISO OP-21 Emergencies by offering unconstrained MWs to the ISO during those events.*
- *The ability to alleviate the system constraints based on the depth (MW) and duration (MWs) of the event.*

WHAT IS A RESOURCE GETTING FROM THIS DESIGN?

- *Revenue up-front to defray the costs of supply arrangements.*
- *Forward price signal for investment decisions.*
- *Clear signals for when those stored fuel MWhs are most valuable.*

WHAT DOES THE MARKET GET FROM THIS DESIGN?

- *Fuel security through a diverse pool of MWs.*
- *Timely transition of the evolving resource mix.*
- *Investment in the existing fuel infrastructure.*
- *Market design changes in critical winter months only.*

