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ISO-NE Fuel Security Market Solution

Forward Enhanced Reserves Market

Fifth Discussion on the "FERM" Winter Product

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A Forward Price Signal Is Needed to Incentivize the Solutions

From November MC

Contributing Causes of the Problem

From ISO-NE deck

- Increase in natural-gas fired generation relying on just-in-time fuel
 - Exacerbated by limited expansion of underlying natural gas delivery infrastructure
- Challenges with fuel delivery logistics during cold weather conditions
- Significant retirements of large, non-gas-fired generation (nuclear, oil, coal)
 - Uncertain regulatory and economic future of remaining aging oil and nuclear units
- Limited dual-fuel storage and tightening emission limits on (most) oil-fired generation

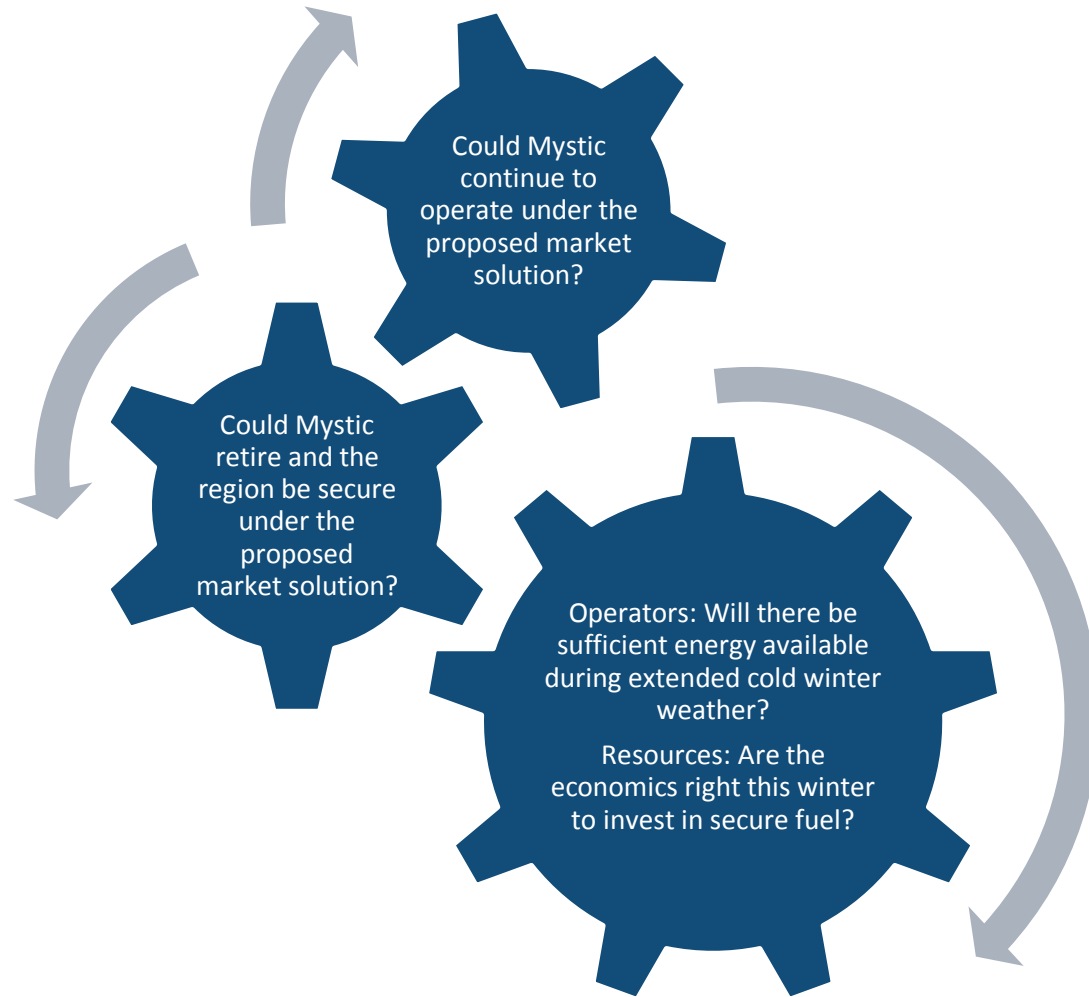
Solutions MDAM + EIRC could encourage

- ✓ Seasonal contracting (tank fill-ups and maybe some LNG)
- ✓ Scheduled fuel deliveries with barges and trucks
- ✗ Dual fuel investment
- ✗ New onsite or offsite fuel reserves
- ✗ LNG infrastructure build out
- ✗ Replacements to significant fuel secure retirements



All problems that fall within a planning horizon timeframe are left unsolved without a forward price signal

Questions to Solve for in a Winter Market Solution



Allow resources to compete and markets to produce cost efficient solutions for winter fuel security

Forward Enhanced Reserves Market

Highlights (presented at Dec. MC)

Fuel Secure Capacity

- Term
 - 3 years ahead for obligation in December - February
- Requirements
 - Adequate fuel contracts or on-site fuel
 - ISO review of contracts or inventory
 - Day-ahead must offer requirement
- Eligibility
 - Technology neutral as long as it meets requirements
- Penalty
 - Penalty for non-performance
 - Penalties for contract deficiency at reconfiguration auction (later slide)

Key Market Design Features

- If resource meets product requirements, resource can participate in the Forward Enhanced Reserves Market (FERM)
- Resource will submit bid price for FERM at same time as Forward Capacity Auction
- ISO responsible for amount of MW or MWh procurement
- No obligation for a generator to offer as FERM product or to have a CSO
- Reconfiguration auctions to confirm contracts and balance positions
- Penalties are incremental to PFP penalties

APPENDIX

FERM Details

Product Procurement

- If resource meets Product Design definition, resource can participate in the Forward Enhanced Reserves Market (FERM) and/or the Forward Capacity Auction (FCA)
 - No obligation to offer into FERM
 - Depending on how ISO procures, MW or MWh basis, supplier will submit offers based off of resource's fuel supply abilities
 - Suppliers must qualify for FERM prior to FCA with Officer Certification of intent to contract for fuel supply
 - Supply does not have to be confirmed through contract validation until 12-6 months prior unless participating in reconfiguration auction
- Resources will provide ISO with a capacity offer and FERM offer prior to FCA
 - No offer cap in FERM, but awards to resources with CSO will be incremental to clearing price
- FERM resources will have daily Day-Ahead must offer obligation in winter months only
 - Allows resource without CSO to participate, for example energy-only resources that only plan to be available for peak days in the winter
- FERM Reconfiguration auction will be held one year and six months prior to the delivery period

FERM Details

Penalties for Non-Performance

- One-year reconfiguration auction
 - To participate in the one-year reconfiguration auction and purchase out of the FERM obligation, a participant must show that they have obtained adequate fuel supply to meet their commitment
 - If resource gets to the one-year reconfiguration auction without adequate fuel assurance, then their FERM obligation is terminated and they are penalized X times price, plus must refund any additional costs to load that the ISO incurred covering the participant's short position
- Six-month reconfiguration auction
 - If resource gets to the six-month reconfiguration auction without adequate fuel assurance, then their FERM obligation is terminated and they are penalized 2X times price, plus must refund any additional costs to load that the ISO incurred covering the participant's short position
- Penalties
 - Calpine is considering a penalty structure for non-compliance
 - Up to X times the full period FERM payment for any outage (excluding transmission)
 - FERM Penalty would be in addition to any PFP penalty

