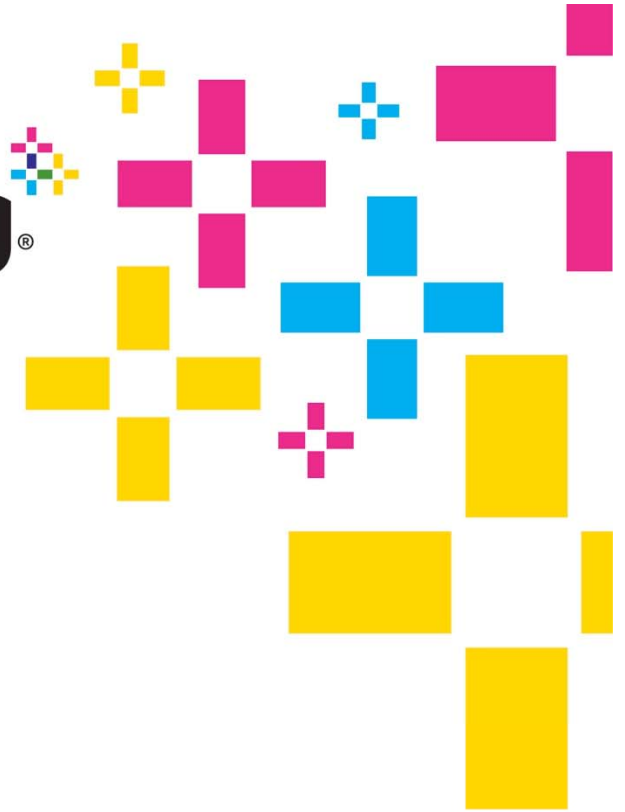




NEPOOL IMAPP Stakeholder Discussion October 21, 2016

Capacity markets & efficient renewable procurement in a carbon-constrained world:

Near-term vs. Long-term

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Today's Discussion

- ✓ **IMAPP Objectives** – States and market participants
- ✓ **'Accommodate' vs. 'Achieve'** – Existing state policy requirements vs. anticipated policy objectives
- ✓ **Two-tier Pricing as a Critical Near-term Step** – maintains price signals and revenue for existing and needed new conventional resources during market transition.



IMAPP Objectives

- ✓ **States' Objective 1:** Accommodate states' near-term procurement mandates in wholesale markets with existing or revised market rules, to maintain reliability at least cost.
 - ✓ States will be proceeding with mandated contracting processes
 - ✓ According to the States, the existing renewable technology resource (RTR) exemption 'reasonably accommodates' state objectives

- ✓ **IMAPP Status:**
 - ✓ Two-tier pricing proposal enables all state policy resources to participate in FCM and avoids 'double-payment' for centrally-procured (FCM) and state-procured capacity
 - ✓ NRG proposal for two-tier also respects Wholesale Suppliers' Objective 1 (below), while RTR exemption and Public Systems' proposals do not



IMAPP Objectives

- ✓ **States' Objective 2:** Implement an ISO-NE administered auction framework for state-mandated policy requirements.
 - ✓ Provide flexibility for states to specify, e.g., quantity, technology, location
 - ✓ Additional design specs: i) revenues should be considered 'in market' for FCM mitigation purposes; ii) states control purchase requirements; iii) enable comparison of alternatives needing transmission or not
- ✓ **IMAPP Status:**
 - ✓ Broad interest in FCEM/FCM-C concept, with many details yet to be worked out; this will take time
 - ✓ Incorporating all of the states' criteria could lead to a 'Swiss Army Knife' design to accommodate any future state policy; may not work particularly well for any of them
 - ✓ In-market vs. out-of-market treatment of revenues cannot be decided *a priori*



IMAPP Objectives

- ✓ **States' Objective 3:** Implement a 'need-based' mechanism in the ISO-NE markets to enable states to retain existing resources for policy purposes.

- ✓ IMAPP Status:
 - ✓ A carbon adder in the energy dispatch could likely address revenue challenges for existing desired resources, but is not necessarily need-based nor easily adjustable over time
 - ✓ A targeted, contract-based approach to retaining existing resources could be accommodated in a two-tier pricing mechanism with appropriate extension of MOPR to Existing Resources



IMAPP Objectives

- ✓ **Wholesale Suppliers' Objective 1:** Support and accommodate states' policy objectives without bearing the full cost of them through wholesale market price suppression
 - ✓ Just as states insist that policy mandates of one state not impose costs on consumers in another state, state policies should not impose undue burdens on investors relying on FERC-jurisdictional markets.
 - ✓ Wholesale markets are the basis for building and maintaining reliability infrastructure, and need to be free of distortion from entry and exit driven by non-market/non-economic factors
- ✓ **IMAPP Status:**
 - ✓ NRG's two-tier pricing proposal is the only solution proposed to date that directly addresses this objective



‘Accommodate’ vs. ‘Achieve’

- ✓ There are existing resources with state-backed contracts pursuant to state policy objectives
- ✓ States have existing statutory requirements to secure additional resources to meet policy objectives
- ✓ The ISO-NE markets must *accommodate* these existing resources and laws while maintaining the integrity of price formation and investment incentives
- ✓ The long-term objective should be to obviate the need for future statutes by enabling the markets to *achieve* a low-carbon, sustainable fleet for the future

To the extent states establish policy goals not met through carbon/renewable attributes that can be integrated into the markets, those can be accommodated through two-tier pricing



The near-term issue – FCM Price Formation

- ✓ With full application of mitigation, i.e., all resources offering at a competitive level (green supply curve), the clearing price in this example is **\$7.66 / kW-mo**, and the cleared quantity is 35,429MW.

- o The total market cost is $\$7.66/\text{kW-mo} \times 35,429\text{MW} = \mathbf{\$3,257 \text{ million}}$

- ✓ With 1,000MW of State Policy (SP) Qualified Capacity inserted as price-takers (blue supply curve), the clearing price is **\$6.83 / kW-mo**, and the cleared quantity is 35,604MW

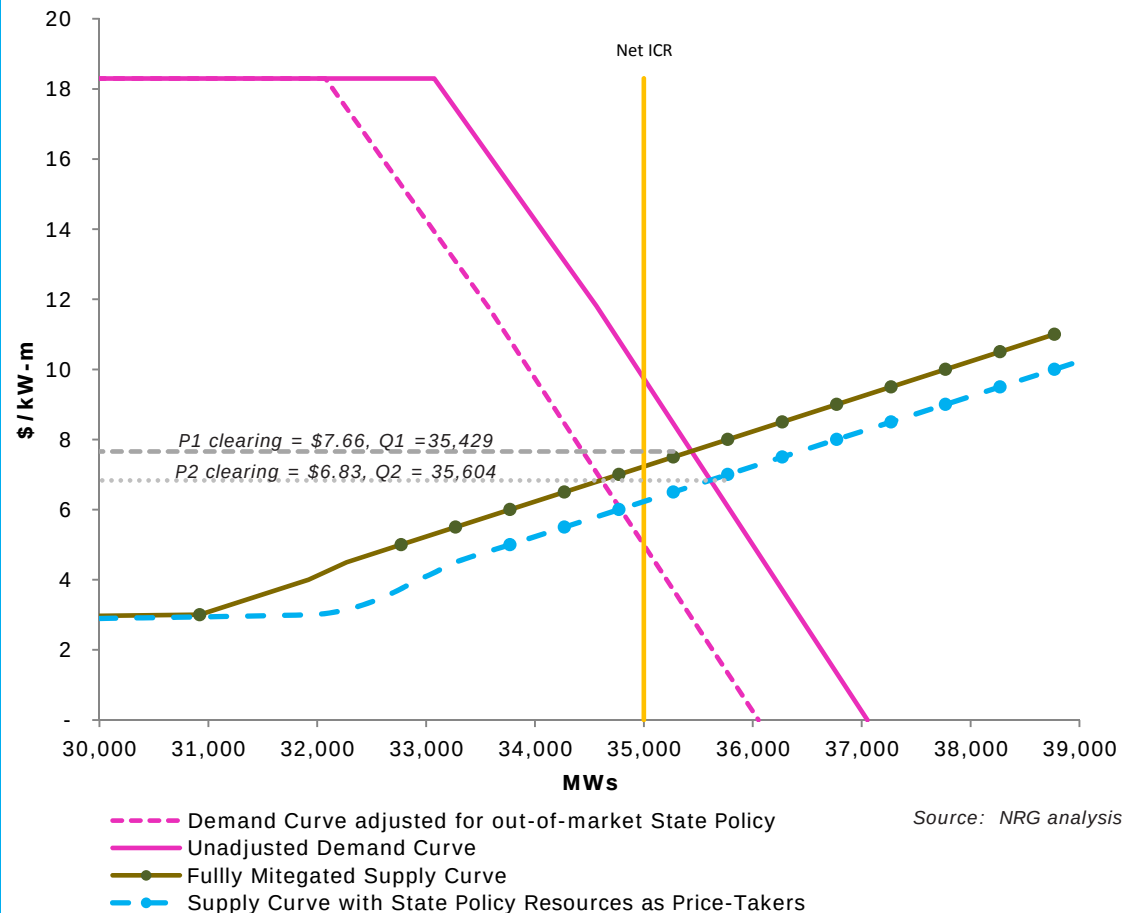
- o The total (market) using the blue curve would be $\$6.83/\text{kW-mo} \times 35,604\text{MW} = \mathbf{\$2,918 \text{ million}}$

- o This is the price-suppression effect of out-of-market capacity

- ✓ Adjusting the market demand (dotted pink demand curve) leads to similar price suppression. Clearing with the green supply stack, the clearing price would be **\$6.83 / kW-mo**, and the cleared quantity would be 34,604MW

- o The total market cost is $\$6.83/\text{kW-mo} \times 34,604\text{MW} = \mathbf{\$2,838 \text{ million}}$

Illustrative FCM auction pricing





The Near-term Challenge

- ✓ States are moving ahead with additional policy-based procurements
- ✓ FCM, and the ISO-NE markets overall, need to maintain the integrity of price formation to support efficient merchant entry and exit
- ✓ NRG's two-tier pricing mechanism:
 - ✓ Enables all state policy resources to access FCM compensation
 - ✓ Maintains marginal price signals for private investment decisions
 - ✓ Does not impose the full cost of state policies on capacity suppliers
- ✓ Two-tier pricing should be pursued even as the region works to develop a market design to *achieve* a low-carbon, sustainable fleet for the future

Questions?