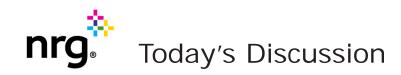


NEPOOL IMAPP Stakeholder Discussion October 21, 2016

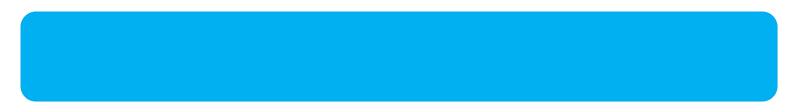
Capacity markets & efficient renewable procurement in a carbon-constrained world:

Near-term vs. Long-term

Pete Fuller

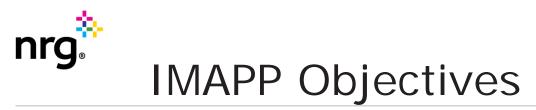


- ✓ IMAPP Objectives States and market participants
- 'Accommodate' vs. 'Achieve' Existing state policy requirements vs. anticipated policy objectives
- Two-tier Pricing as a Critical Near-term
 Step maintains price signals and revenue
 for existing and needed new conventional
 resources during market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





- 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 centrallyprocured (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



- ✓ 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 <u>any</u> 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*



 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:

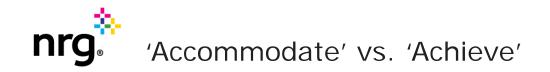
- ✓A carbon adder in the energy dispatch could likely address revenue challenges for existing desired resources, but is not necessarily need-based nor easily adjustable over time
- ✓A targeted, contract-based approach to retaining existing resources could be accommodated in a two-tier pricing mechanism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



- ✓ 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 FERCjurisdictional 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

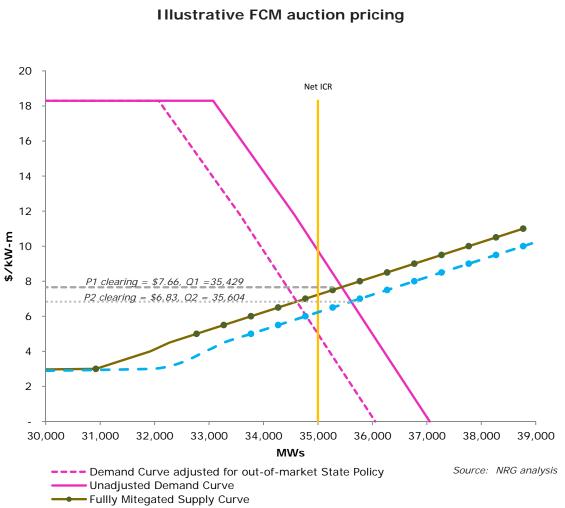


- ✓ There are existing resources with state-backed contracts pursuant to state policy objectives
- ✓ States have existing statutory requirements to secure additional resources to meet policy objectives
- ✓ The ISO-NE markets must *accommodate* these existing resources and laws while maintaining the integrity 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

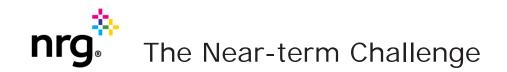
To the extent states establish policy goals not met through carbon/renewable attributes that can be integrated into the markets, those can be accommodated through two-tier pricing



- 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.
 - The total market cost is \$7.66/kWmo x 35,429MW = \$3,257 million
- ✓ With 1,000MW of State Policy (SP) Qualified Capacity inserted as pricetakers (blue supply curve), the clearing price is \$6.83/kW-mo, and the cleared quantity is 35,604MW
 - The total (market) using the blue curve would be \$6.83/kW-mo x 35,604MW = \$2,918 million
 - 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
 - The total market cost is \$6.83/kWmo x 34,604MW = \$2,838 million



Supply Curve with State Policy Resources as Price-Takers



- ✓ States are moving ahead with additional policybased 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 <u>all</u> 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?