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ISO new england 20 years

Competitive Auctions with Subsidized Policy Resources

The ISO's Proposed Approach to Balancing Wholesale Markets and States' Policies

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Summary

- The ISO is offering a conceptual proposal for Forward Capacity Market (FCM) enhancements to:
  - Accommodate subsidized resources into the FCM over time, and
  - Preserve competitive capacity pricing for unsubsidized resources
- This presentation summarizes the objectives, key features, and benefits
- We seek stakeholder feedback, and plan to discuss design details at the NEPOOL Markets Committee beginning in June

ISO Discussion Paper Available

ISO new england

Competitive Auctions with Subsidized Policy Resources

ISO Discussion Paper
April 2017

Executive Summary

Noting a growing tension over the participation of state-subsidized new generation resources in the Forward Capacity Market (FCM), ISO New England's stakeholders initiated discussions in 2016 on Integrating Markets and Public Policy (IMAPP). Specifically, representatives of the New England states had expressed concern over the potential for electricity consumers to end up 'paying twice': once for the cost of capacity resources procured in the FCM, and a second time for the cost of subsidizing additional state-mandated new supply resources. Other stakeholders highlighted a different concern: the potential for capacity market prices to be depressed below competitive levels if substantial amounts of new subsidized resources entered the FCM without mitigation. That impact could undermine investors' willingness to maintain existing supply resources, and hamper the FCM's ability to attract competitive (i.e., unsubsidized) new investment cost-effectively when the power system requires it.

Following these stakeholder discussions, ISO New England agreed to develop a proposal to address both investors' and states' concerns about subsidized new resources' participation in the FCM. This paper explains ISO's proposal. Conceptually, the ISO's approach addresses these concerns by closely coordinating the entry of (subsidized) new resources with the exit of (unsubsidized) existing capacity resources. By doing so, the FCM can accommodate the entry of significant subsidized resources over time while maintaining competitively-based capacity prices for non-subsidized resources.

- Summarizes the challenges of integrating state policy resources into the FCM
- Presents the ISO's conceptual proposal and design principles in greater detail

Competitive Auctions with Subsidized Policy Resources

https://www.iso-ne.com/committees/participants/wholesale-markets-state-public-policy-initiative

States Are Subsidizing Clean Energy Resource Development to Meet Their Legislative Requirements

- Growing provision of out-of-market revenues through long-term contracts
- Legislative initiatives vary by state

States	Recent State Resource Procurement Initiatives	Expected Resources	Target MW (nameplate*)
MA, CT, RI	2016 Multi-State Clean Energy RFP	Solar, wind	460
MA	2016 Energy Diversity Act	Clean energy, incl. hydro import	Approx. 1200
MA	2016 Energy Diversity Act	Off-Shore Wind	Up to 1600

*Note: Nameplate MW may be higher than qualified FCM capacity MW

Concerns over Subsidized Resources

- **Status quo.** Under the Minimum Offer Price Rule (MOPR), resources may be built to meet state policies but cost too much to clear in the FCM
  - Limited MOPR exemption for some new renewables
- **Likely Results are Inefficient**. Region may end up overbuilt for Resource Adequacy needs
- **States concerned** that consumers would bear unnecessarily high costs if state policy resources do not participate as FCM resources:

FCM Costs + Additional retail charges to fund state subsidies

Competitively-Based Capacity Pricing Remains Essential

- Subsidized renewables can profitably sell in the capacity market for artificially low prices
- MOPR prevents capacity price suppression, helping to ensure competitive capacity prices
  - Even if unintentional, subsidized entry has a similar effect to buyer-side market power
- Competitive capacity pricing is essential to attract investment in (non-subsidized) new entry cost-effectively when needed

ISO's Proposed Path Forward

- The ISO is developing a capacity market design solution:
  - Accommodates subsidized resources into the Forward Capacity Market (FCM) over time, and
  - Preserves competitive capacity price signals for unsubsidized resources needed for regional Resource Adequacy

- It builds upon the existing capacity market framework in New England
- It is based on specific design principles and objectives discussed during the 2016 stakeholder-led discussions on Integrating Markets and Public Policy (IMAPP)

Four Design Objectives and Principles

1. **Competitive capacity pricing.** Maintain competitively-based capacity auction prices, by minimizing the price-suppressive effect of out-of-market subsidies on competitive (unsubsidized) resources

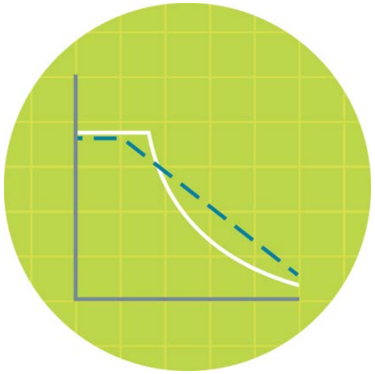
2. **Accommodate entry of subsidized resources into the FCM over time.** Minimize the potential for New England developing too many resources in the power system, an inefficient and costly outcome

3. **Avoid cost shifts.** To the extent possible, minimize the potential for one state's consumers to bear the costs of other states' subsidies

4. **A sustainable, market-based approach** that minimizes administrative mechanisms and extends, rather than upends, the existing capacity market framework

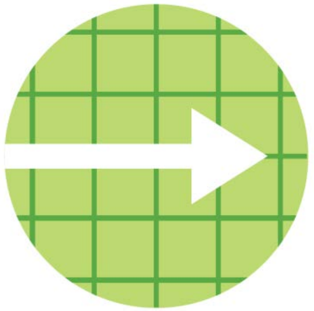
Key Concept: Coordinate Entry and Exit

- **Two forms.** Coordinate entry of (subsidized) **new** and:
  1. **Exit** of (unsubsidized) **existing** capacity [*New v. Existing*]
  2. **Entry** of (unsubsidized) **new** capacity [*New v. New*]
- Both forms help prevent the over-build problem *and* capacity price suppression with subsidized new entry
- **When there is no new subsidized supply to coordinate:** FCA's competitive price signals continue to guide entry and exit



Solution Approach: A Substitution Auction

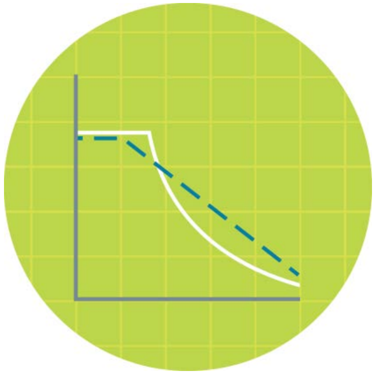
- After the FCA: Existing or new resources awarded capacity supply obligations (CSOs) may **transfer their obligations** to new, *subsidized* resources that do not have CSOs
- This is arranged using a two-settlement process known as a ***substitution auction***



  - Existing resources must then **permanently retire** (they have no CSOs)
  - New subsidized entrants may also **substitute for** unsubsidized new resources (which would then not enter)
- The substitution auction generally does not affect payments to existing (non-retiring) resources awarded CSOs, or to loads

Solution Stage 1 – The Primary FCA

- **The ISO would conduct the FCA in two stages**: The primary auction and the substitution auction
- **First stage:** ISO runs the FCA
  - Primary FCA determines the total supply to be procured, and resources' initial CSOs
  - MOPR applies to all new resource offers
  - Uses the current capacity demand curves



- The primary FCA sets the competitively-based capacity clearing price
  - This achieves Design Objective #1…
  - But subsidized new resources are still likely to be priced too high to clear the primary FCA

Solution Stage 2 – The Substitution Auction

- **Second stage:** Substitution auction runs promptly after the FCA
  - **Supply:** Subsidized resources are entered on the supply side, *without* a MOPR applied to their supply offer prices
  - **Demand:** Retirement bids and new offers awarded initial CSOs in first stage are entered *on demand side,* at same offer prices in primary FCA
  - No administrative demand curves are used in the substitution auction
- Through clearing this auction, resources that retained CSOs in the primary FCA **transfer their obligations** to subsidized new resources that did not clear in the FCA (due to the MOPR)
  - The subsidized supply is paid the substitution auction's clearing price
  - Subsidized supply that does not clear in either auction can participate as new (subsidized) supply in next year's auctions

SUBSTITUTION AUCTION: EXAMPLES

How the two-settlement substitution auction works

Next: Two Numerical Examples

- **Example A:** Coordinating subsidized new entry with exit of existing resources
- **Example B:** Coordinating subsidized new entry versus *un*subsidized new entry
- **Both examples will show:**
  1. How prices are set and the two-stage market settles
  2. No price suppression in the FCA for competitive capacity
  3. Accommodates entry of subsidized capacity into the FCM (over time)
  4. No impact on capacity payments by loads (generally)
- **The market clearing process is the same in both examples, but the settlements are different in the two cases**

Example A: The Setting

- Assume the FCA has a range of offers from seven resources

Low-cost existing supply

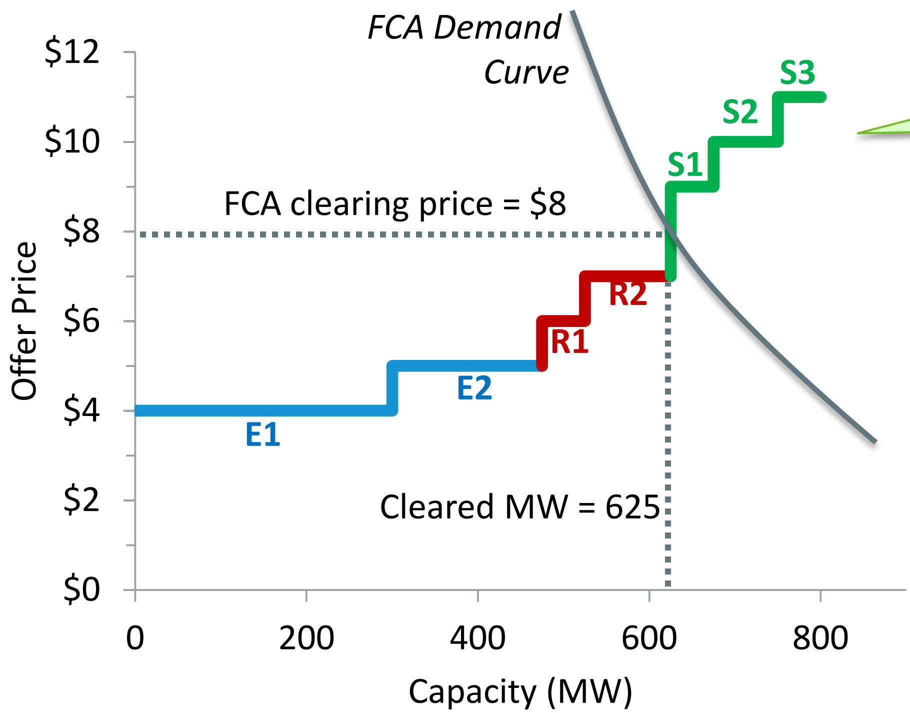
Two old, high-cost units that would retire without capacity revenue

Three new subsidized units have high offer prices due to MOPR

Resource Name	Offer Type	Offer Price with MOPR ($/kw-mo)	Preferred (Subsidized) Offer Price ($/kw-mo)	Offer Capacity (MW)
E1	Existing Supply Offer	$4	-	300
E2	Existing Supply Offer	$5	-	175
R1	Retirement Offer	$6	-	50
R2	Retirement Offer	$7	-	100
S1	New Supply Offer	$9	$0	50
S2	New Supply Offer	$10	$2	75
S3	New Supply Offer	$11	$4	50

Example A. Stage 1 – The Primary FCA

- Existing and retirement offers are awarded capacity obligations



Three new subsidized units **do not clear** (due to the MOPR)

- $8 / kw-mo. clearing price
- 625 MW total supply

Example A. Stage 1: Primary FCA – Full Results

- Total cost to load for the primary FCA: **$5M** / mo.

Resource Name	Offer Type	Clearing Price ($/kw-mo)	Cleared Capacity (MW)	Resource Payment ($/mo.)
E1	Existing Supply Offer	$8	300	$2.4M
E2	Existing Supply Offer	$8	175	$1.4M
R1	Retirement Offer	$8	50	$400K
R2	Retirement Offer	$8	100	$800K
S1	New Supply Offer	$8	-	-
S2	New Supply Offer	$8	-	-
S3	New Supply Offer	$8	-	-
Auction Totals			**625**	**$5.0 M**

Awarded obligations

Awarded obligations

Do not clear primary FCA

Example A. Stage 2 – The Substitution Auction

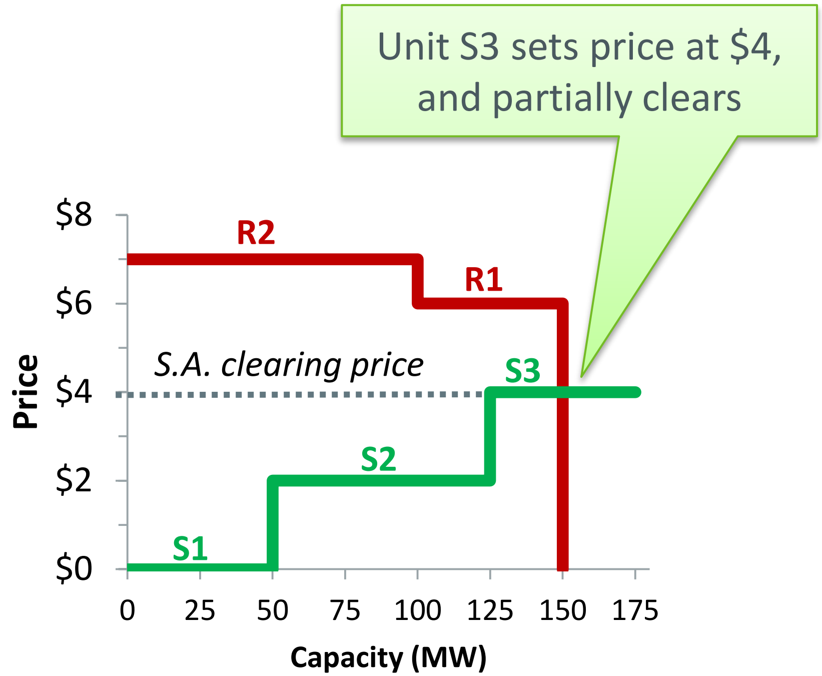
- No MOPR for new supply. Retirement bids enter as *demand.*

STAGE 2 – SUPPLY OFFERS

Resource Name	Offer Price without MOPR ($/kw-mo)	Offer Capacity (MW)
S1	$0	50
S2	$2	75
S3	$4	50

STAGE 2 – DEMAND BIDS

Resource Name	Bid Price ($/kw-mo)	Bid Capacity (MW)
R1	$6	50
R2	$7	100



- S1, S2, clear, and S3 partially, *acquiring* CSOs
- R1, R2 *shed* their CSOs

Example A. The "Severance" Payment

- In effect, R1 receives a "severance" payment of $200K/month, in exchange for a final obligation: to retire from the FCM

	Auction	Cleared (MW)	Price ($/kw-mo.)	Payment ($/mo.)
R1 sells capacity	FCA	50	$8	$400K
R1 "buys out" obligation	S.A.	–50	$4	($200K)
Final Outcome (Net)		**0 MW CSO**		**$200K**

- **Subsidized units** (S1, S2, S3) are paid the substitution auction price of $4/kw-mo., by the retiring resources "buying out" their CSOs
  - Analogous to the two-settlement process that occurs between the Day-Ahead and Real-Time energy markets

Example A. Total Capacity Payments, All Resources

Resource Name	FCA Clearing Price ($/kw-mo.)	FCA Cleared (MW)	FCA Credit ($/mo.)	S.A. Clearing Price ($/kw-mo.)	S.A. Cleared (MW) (deviation from FCA)	S.A. Credit (Charge) ($/mo.)	Final Capacity Obligation (MW)	Final Auctions Payment ($/mo.)
E1	$8	300	$2.4M	$4	-	-	300	$2.4M
E2	$8	175	$1.4M	$4	-	-	175	$1.4M
R1	$8	50	$400K	$4	–50	($200K)	-	$200K
R2	$8	100	$800K	$4	–100	($400K)	-	$400K
S1	$8	-	-	$4	50	$200K	50	$200K
S2	$8	-	-	$4	75	$300K	75	$300K
S3	$8	-	-	$4	25	$100K	25	$100K
Auction Totals		**625**	**$5.0 M**		**0**	**$0**	**625**	**$5.0 M**

- Subsidized resources S1, S2, S3 (combined) receive 150 MW of supply obligations, and total capacity payments of $600K/mo.

Payment Logic: Who is Paying What and Why?

- **The states' subsidies** enable high-cost, existing resources to receive a **net payment to retire** and be replaced by states' preferred new (e.g., higher-cost clean energy) resources
  - **Load entities** still pay the same total capacity cost, with or without the substitution auction: $5M/mo., in this example
- **In this two-settlement design, the payments' logic is:**
  - Subsidies enable the new units to offer capacity *below* their true costs
  - That, in turn, provides an opportunity for potentially retiring units to transfer ("buy out") their obligations at less than *their* true cost
  - The retiring units transfer their supply obligations to the subsidized units, and transfer part (but not all) of their primary FCA payments
  - The retiring units keep a portion of their primary FCA payment, in consideration for a final obligation to retire

Accommodating Subsidized New Entry Addresses Concerns over Consumers' Total Costs

- New (subsidized) supply clearing in the substitution auction **becomes existing** supply in subsequent FCAs
- In subsequent auctions, it would receive the ***primary* FCA clearing price** (until it eventually retires…)
- This capacity market revenue stream should be expected to reduce the out-of-market costs incurred by consumers to subsidize the development of state-preferred policy resources
- **Addresses states' concerns** over consumers' total costs if the state policy resources were unable to participate in the FCM

Example A: Summary

- Preserves **competitive capacity pricing** in the primary FCA (Design Objective #1)
- Accommodates **entry of subsidized new resources** into the FCM, minimizing potential for inefficient over-build (Design Objective #2)
- Increases financial incentives for existing, high-cost resources **to retire earlier** (relative to current FCM rules)
- Loads continue to **pay only the costs of the primary FCA**, like today
  - Consumers in non-subsidizing states do not bear higher costs because subsidized resources are accommodated (Design Objective #3)
- Transparent, competitive-market approach to balancing wholesale markets and public policies (Design Objective #4)

New Case: Treatment of *Un*subsidized New Supply in the Substitution Auction

- Coordinating 'new v. new' requires balancing three issues:
  1. **Deterring new supply by "fictitious entrants"** that only seek to substitute out for a payment, undermining the primary FCA price
  2. **Minimizing potential for an inefficient over-build** of the system when new entry is *not* needed
  3. **Preserving entry incentives** for competitive new entry *when needed*
- There is a tension (no 'perfect' solution) to these three issues
- Proposed treatment for 'new v. new' cases is similar to the prior example, with a modified settlement rule (*next*)

Example B: An *Un*subsidized New Supply Offer

- Assume competitive new supply N1 offers 100 MW at $7 / kw-mo. (*no retirement bid R2*). All other assumptions are unchanged.

Low-cost existing supply

Old, high-cost unit that would retire without capacity revenue

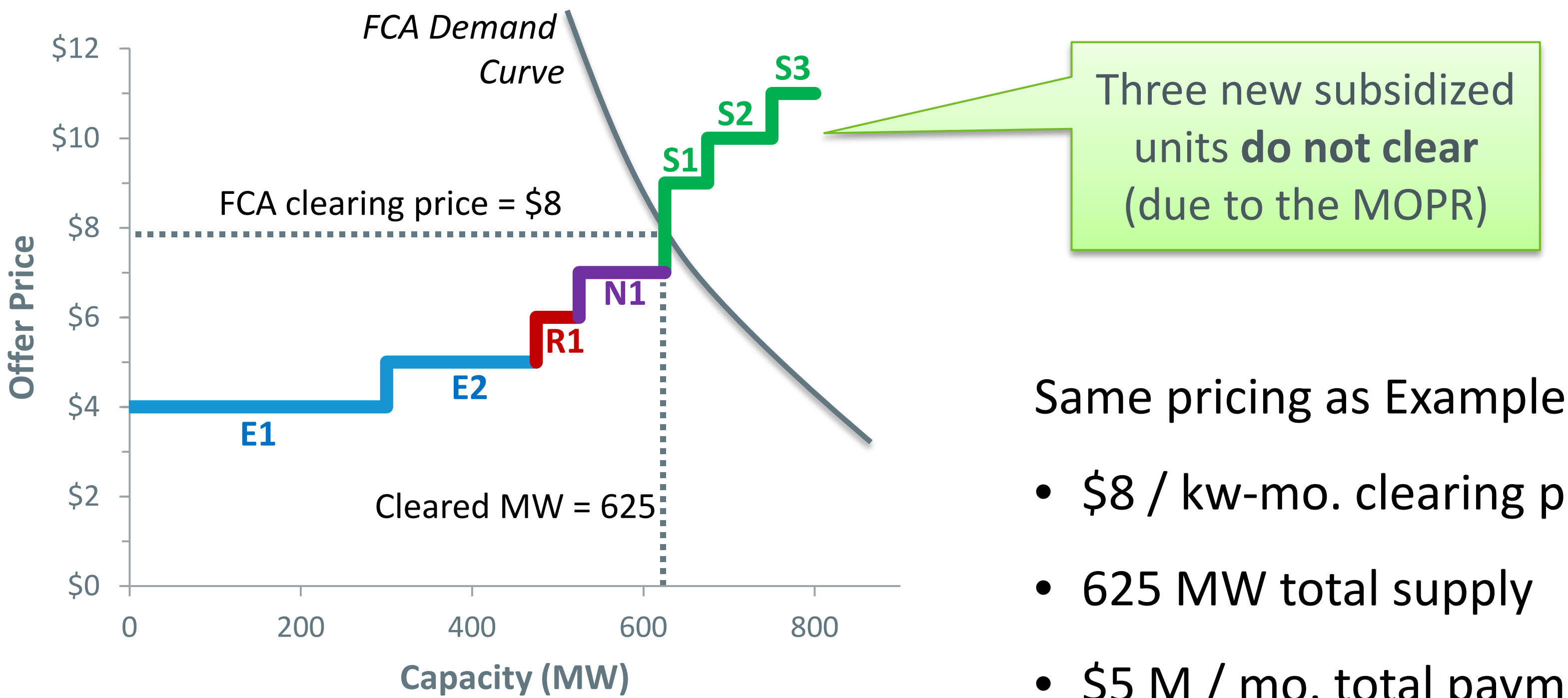
Competitive new unit that requires capacity revenue to enter market

Three new subsidized units have high offer prices due to MOPR

Resource Name	Offer Type	Offer Price with MOPR ($/kw-mo)	Preferred (Subsidized) Offer Price ($/kw-mo)	Offer Capacity (MW)
E1	Existing Supply Offer	$4	-	300
E2	Existing Supply Offer	$5	-	175
R1	Retirement Offer	$6	-	50
N1	New Supply Offer	$7	-	100
S1	New Supply Offer	$9	$0	50
S2	New Supply Offer	$10	$2	75
S3	New Supply Offer	$11	$4	50

Example B. Stage 1 – Primary FCA

- All existing resources' bids, and the competitive new resource N1, are awarded initial capacity obligations



Same pricing as Example A:

- $8 / kw-mo. clearing price
- 625 MW total supply
- $5 M / mo. total payments

Example B. Stage 2 – The Substitution Auction

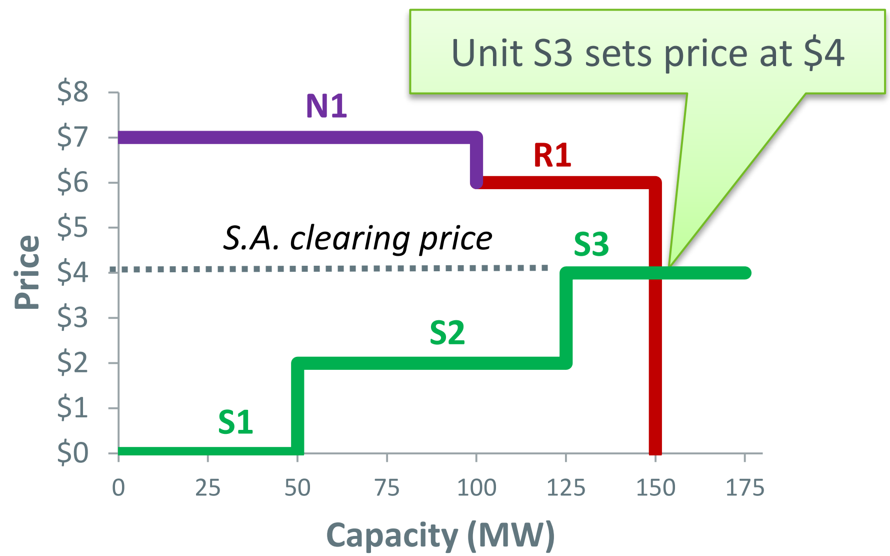
- Retirement bids and new supply offers (awarded obligations in primary FCA) enter as *demand* in the substitution auction

STAGE 2 – SUPPLY OFFERS

Resource Name	Offer Price without MOPR ($/kw-mo)	Offer Capacity (MW)
S1	$0	50
S2	$2	75
S3	$4	50

STAGE 2 – DEMAND BIDS

Resource Name	Bid Price ($/kw-mo)	Bid Capacity (MW)
R1	$6	50
N1	$7	100



- S1, S2, clear, and S3 partially, *acquiring* CSOs
- R1, N1 *shed* their CSOs

Example B. Total Capacity Payments

- **Modified settlement rule.** Resource N1 does not receive a CSO, and incurs no credit or charge:

Resource Name	FCA Clearing Price ($/kw-mo.)	FCA Cleared (MW)	FCA Credit ($/mo.)	S.A. Clearing Price ($/kw-mo.)	S.A. Cleared (MW) (deviation from FCA)	S.A. Credit (Charge) ($/mo.)	Final Capacity Obligation (MW)	Final Auctions Payment ($/mo.)
E1	$8	300	$2.4M	$4	-	-	300	$2.4M
E2	$8	175	$1.4M	$4	-	-	175	$1.4M
R1	$8	50	$400K	$4	–50	($200K)	-	$200K
N1	$8	100	**$0**	$4	–100	**$0**	-	**$0**
S1	$8	-	-	$4	50	$200K	50	$200K
S2	$8	-	-	$4	75	$300K	75	$300K
S3	$8	-	-	$4	25	$100K	25	$100K
Auction Totals		**625**	**$4.2 M**		**0**	**$400K**	**625**	**$4.6 M**

– *Note:* Reduces total payments from $5.0 M to $4.6 M: resource N1 is replaced by lower-cost subsidized supply that is paid the lower S.A. price

Proposed Treatment Balances the Three Issues

1. **The zero net payment** to "substituted out" competitive new supply **solves Issue 1**
   – "Fictitious entry" is unprofitable, preserving primary FCA pricing

2. **Substituting-out** competitive new for subsidized new **solves Issue 2**
   – Minimizes inefficient over-build when new entry is *not* needed

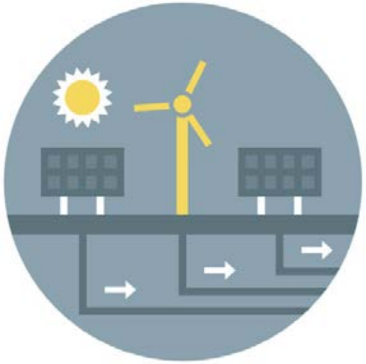
3. **Primary FCA clearing price** is paid to competitive new supply if not substituted out (e.g., if no subsidized supply)
   – Provides incentive for competitive new entry when there is no subsidized new supply (thus no substitution auction)

Examining Key Insights

- The substitution auction does not change the total MW with capacity supply obligations
  - Avoids both excess supply and FCM price deterioration over time
  - Maintains same total cost to load as primary FCA (generally)
- Provides **entry incentives** if there is no subsidized supply
- Sound design framework that can accommodate **entry and exit across constrained capacity zones** in the substitution auction (*see* ISO Discussion Paper appendix)

Notable Properties of the Substitution Auction

- It is likely to help New England states **achieve their GHG policy goals** (e.g., older, high-emitting units will retire sooner)
- The substitution auction accommodates new subsidized supply resources in a **technology-neutral** way
  - Accommodates future state subsidies to non-renewable resources (e.g., storage, fuel cells, large-scale hydro, and so on)
- It provides a mechanism to replace the (200 MW annual) existing MOPR renewables exemption by:
  - Accommodating greater amounts of subsidized capacity into the FCM over time, and
  - Replacing an administrative rule with a sustainable, market-based solution



Risks, Limitations, and Caveats

- **No perfect solution.** Some design objectives are in fundamental tension, and there is no truly perfect solution
- **No guarantees regarding retirements' pace.** If no new offers or retirement bids are submitted, subsidized resources must await following year to seek obligations
  - Seeking to *coordinate* entry and exit over time
- **Some retirements may impact winter fuel security.** This is a complex issue to be addressed in a separate process
- **MOPR does not apply to existing resources in New England**, and we are not proposing to extend it

Next Steps

- The ISO seeks stakeholder input, and will discuss this proposal in the NEPOOL technical committee process beginning in June
- **Anticipated timeline** for 2017:
  - May 17: IMAPP Meeting
  - June – November: Discussions at NEPOOL Markets Committee
  - December/January: Participants Committee Vote and FERC Filing
- **Implementation**:
  - Targeting FCA 13, to be conducted in February 2019
  - Retirement bids are due March 2018

Questions