NEPOOL
NEW ENGLAND POWER POOL

AGENDA

Integrating Markets and Public Policy (IMAPP)
Plenary Meeting #2
August 30, 2016
Seaport Hotel, Boston, MA

Morning Session — **10:00 a.m. - 12:30 p.m.**

- **Introductory Remarks**

- **New Presentations and Updates**
  - PowerOptions -- New Presentation on Guiding Principles — presentation posted
  - AR/End User Sector Representative -- Energy Storage Proposal Update — no materials
  - High Liner Foods -- Clean Power Plan Solicitation Update — no materials

- **Panel Discussion on Forward Clean Energy Market (FCEM)** — presentation posted
  - NextEra
  - FirstLight Power Resources
  - National Grid
  - RENEW
  - NRG

Lunch Break — **12:30 - 1:00 p.m.**

Afternoon Session — **1:00 - 4:30 p.m.**

- **Detailed Discussion on Pricing Carbon in Energy Market** — presentation posted

- **Detailed Discussion on FCM Two-Tiered Pricing Construct** — presentation posted

- **Concluding Remarks/Discussion of Next Steps**

To: NEPOOL Participants Committee
From: NESCOE
Date: August 19, 2016
Subject: IMAPP: Initial Solution Proposals Follow-up Questions

NESCOE appreciates NEPOOL commencing dialogue about a potential range of wholesale, market-based solutions that could enable the integration of markets and public policies (IMAPP). Pursuant to NEPOOL's request at the close of business at the first IMAPP meeting on August 11, 2016, please find below NESCOE's questions related to the market-based solutions presented. The questions are set forth by subject matter, rather than by solution proponent.

Many of the presenters stated that their proposals would require additional discussion to inform the development of further details. We appreciate the need for that, and understand it will take some time. We provide here the full set of questions we have at this time to get answers set out and to inform near-term discussion. We anticipate that solution proponents will be able to answer some questions by the August 30, 2016 meeting, and may need further discussion to answer other questions. We leave it to the solution proponents to sort through which questions are relevant to their presentations and which may require more time.

Please do not interpret the nature or number of questions as indicative of an evolving NESCOE position or focus with respect to any of the proposals.

Finally, at the end of the document is a chart listing the preliminary "goal posts" states issued in June 2016. We request that solution proponents indicate whether their proposal satisfies each "goal post" and briefly explain how.

Variants of a Forward Clean Energy Market (FCEM):

FCEM Product Definition

1. The value of energy varies by season, time of day, and location. Based on technology, location, and other factors, different clean resources produce relatively more energy during certain seasons, times of day and locations. Does your proposal ensure that the most valuable clean energy resources are more likely to clear in the forward clean energy auction (e.g. a resource that runs on most summer days vs one that runs mostly at night)? If so, please explain how?

2. Would each clean energy resource in the FCEM be required to submit a single offer price that is fixed annually for all MWh offered for the forward year or would each resource be required to submit multiple fixed offer prices that vary by season and time-of-day with each price associated with a specific number of MWh to be delivered?

    a. If based on a time-of-day or season how would the clearing price be determined?
    b. What standard would be used to base the resources offer price (e.g. cost of production, revenue requirement, etc.)?

3. What exactly is purchased from the winners in the forward clean energy auction (*i.e.,* what is the product)?
    a. Is the payment per MW per year, or per MWh with a fixed annual MWh quantity, or something else?
    b. What does the winning resource have to do to get the payment (or under what circumstances will its payment be reduced)?
    c. Is it a two-part payment mechanism, such as fixed payment or floor?

4. Are *existing* clean energy resources permitted to participate in the auctions or do you consider the FCEM construct to be available only for new resources that begin operation as of a certain date (*e.g.*, resources with a commercial operation date of January 2020)? Please explain the reasoning behind the answer.

5. Do you consider demand response a clean energy resource eligible to participate in the proposed mechanism?

6. In connection with how far in advance forward procurement auctions would occur, please provide your view of the pros and cons of alternative timeframes?

FCEM Procurement Amounts

7. Please explain how the quantity of the forward clean energy procurement is determined.
    a. Is this based on needs reflecting state requirements and how are the requirements determined by state (e.g. RPS only or other)?
    b. Will the states, or some subset of states with similar policy objectives, have input to the procurement quantities and willingness to pay (maximum prices), for each auction? (Consider, for example, that current Renewable Portfolio Standard requirements have an alternative payment structure to ensure that clean energy is not purchased at any price, and state-approved PPAs must typically pass some form of a cost-effectiveness test.)
    c. To what extent does the location of the resource impact the clearing price? What happens under your proposal if transmission constraints cause some zones to have relatively high prices? Or what if few resources are offered in some

locations at some times? Will there be a mechanism to reduce or defer purchases if prices rise (such as a sloped demand curve)?

   d. Would the selected resources be required to deliver into the state(s) with the resource requirement needs (in other words, do transmission constraints matter)? Could resources located in one area offer into another area, if possession of firm transmission rights could be demonstrated?

8. Some clean energy resources are intermittent, increasing the need for flexible resources available when they are generating; other clean resources have that impact to a lesser extent, so, other things equal, they impose less cost on the system. Some clean energy resources will require significant new transmission infrastructure that may be included in regional transmission rates. Will the forward clean energy procurement recognize these differential impacts in any way, and if so how?

9. The value of different clean energy resources will depend upon the extent to which the grid has sufficient flexible and fast-ramp capacity to manage the intermittent nature of many clean energy resources. Further, whether there is ample energy storage, fast-ramp capacity, etc., will influence the relative value of different clean energy resources at different times and locations on the grid. How would the introduction of storage, fast-ramp capacity, etc. be determined? Would it be market-driven, or based on ISO planning (like transmission)? How will this be coordinated with forward clean energy procurement, if at all?

10. Explain whether and how the availability of storage at substations would affect the value of clean energy resources depending upon their location & technology?
    a. How would storage levels, locations and time frames be determined?
    b. Would storage resource deployment be coordinated with forward contracting of clean energy resources, if at all?
    c. Would clean energy resource developers have any way to influence the storage placement decisions (for instance, by accepting some cost allocation)?

FCEM: Relationship to Other Markets and Policies Solutions

11. Do the selected resources in the FCEM participate as they normally would in energy and ancillary services markets and earn market prices, or do they earn a "greater of" pricing, or something else? To the extent that "greater of" pricing is proposed, how does this impact price certainty which can be a benefit of PPAs.

12. If "greater of" pricing is proposed, would this not distort the results toward resources with low-value production? If not, please explain. Also, how will the actual delivery of MWhrs that are purchased in the FCEM be matched to the real time production (*e.g.,* if 100MWhrs are purchased in the FCEM, is it the first 100MWhrs produced from that resource or some other allocation)?

13. Please provide examples of how the selected clean energy resources participate in FCM and explain how the risk to consumers of purchasing excess capacity is reduced under the proposals. In providing the examples please show resources that have state-approved Power Purchase Agreements (PPAs) and that 1) clear and 2) do not clear in the FCEM.

14. Please explain how the forward clean energy auction is similar to and different from a carbon pricing mechanism with respect to factors identified in the Goal Post document, including but not limited to potential cost to consumers?

15. Please explain how the forward clean energy market would interact with RGGI?

16. Please consider and explain what approaches could be used to mitigate any unwanted inter-state implications (e.g., high demand for clean energy resources in one state runs up the price paid in another state with more modest demands.).

17. What are the advantages and disadvantages of an ISO New England-administered mechanism, as compared to individual states doing a similar procurement according to the state's needs and parameters?

__Generation PPAs:__

18. Please explain how the Clean Energy PPA mechanism would work. Specifically:

    a. Would there be a FERC-approved process that, when followed, resulted in PPAs not subject to the MOPR?
    b. Would the mechanism have annual limits (such as the current 200 MW/year exemption level) or any other features designed to minimize potential market impacts?
    c. Would the mechanism require that the PPAs be far enough forward in time to allow the market to anticipate and absorb the capacity?
    d. What entity would be the counterparty to the PPA? Would a legally enforceable tariff-based revenue stream of a long-term duration suffice, instead of a PPA?
    e. To the extent that the Clean Energy PPA mechanism is designed to cover minimum annual revenue requirements, would this revenue requirement be determined on an individual or generic unit basis? To the extent that the revenue requirement is determined on a generic basis, what would be the process for choosing the proxy unit?

19. Would you expect the term of the PPA's to be tiered (terms of 5/10/15/20 years) to allow for turnover and new technologies to displace older ones?

Voluntary-Residual Market Structure:

20. Please describe the changes to FCM that would be required to transform it into a residual mechanism?

21. Please identify the changes needed to enable consumers, states, and public power entities to procure and pay for resources that meet their objectives?

22. What are the advantages of a Coordinated Plan with respect to clean energy targets, compared to each state having its own plan (perhaps coordinated with other states, but on a voluntary basis)?

23. Under these proposals is the expectation that request for proposals (RFP's) are the preferred method for solicitation or other methods? Also, would a tier approach be preferred?

Carbon Adder Proposals:

24. Please discuss whether consumers would be "at risk of material energy market cost increases that do not lead to new clean carbon resources being built?"

25. Would a carbon adder provide an incentive to *existing* resources to lower their current carbon footprint?
    a. Please provide examples of how existing resources could lower their current carbon footprint along with an approximation of the adder cost needed to achieve such reductions.

26. Exelon - Please provide detail on how you arrived at the avoided cost calculations on slide 7 of your presentation. Please provide specific information about the potential energy and capacity market mitigation calculations.

Two-tier Pricing Proposals:

27. Please explain the benefits to consumers of a two-tier pricing model compared to the "status quo" where states simply meet their statutory requirements using PPAs and meet reliability needs through the FCM? All things equal, are the cost and total capacity procurement roughly the same under the two procurement models?

28. Would the implementation of a two-tier pricing model create distorted bidder incentives? If so, please explain and suggest possible mitigation techniques that could be implemented.

Goal Post Comparison

http://www.nepool.com/uploads/IMAP_20160621_Goal_Posts_States.pdf

"Goal Post" Item	Does Proposal Satisfy (Y/N)	Explain
A Solution Should:		
1. Enable reaction to different market conditions and changing public policy priorities over time (i.e., not assume that the requirements of state laws are static over time).		
2. Focus on achieving longer-term goals (10-30 years) cost-effectively, with the ability to incorporate needed shorter-term mechanisms to achieve near-term policy requirements.		
3. At a minimum, enable the achievement of the current RPS requirements of each state.		
4. In the near-term, consider the need to accomplish current policy objectives under discussion including, for example, up to 2,400 MWs of hydropower and 1,200 MWs of on- or off-shore wind. These numbers are illustrative and could vary according to the outcome of current matters, including but not limited to the three-state Clean Energy RFP.		
5. Consider mechanisms to ensure consumers in any one state do not fund the public policy requirements mandated by another state's laws.		
6. Attempt to minimize short-term financial effects to current existing resources.		

A Solution Should Not:		
1. Imprudently increase costs to consumers over the costs that they would incur under the status quo/current market design.		
2. Over the long-term, include out-of-market mechanisms unless those ultimately are determined to be required in order to meet the objective and limit overall costs of the design (i.e., markets are not an objective themselves; they are a means to place risk with shareholders and to serve consumers at the lowest cost).		
3. Produce undue windfall profits for existing non-carbon or carbon emitting resources (i.e., existing resources and particularly existing carbon-emitting resources should not profit from state requirements to increase the amount of non-carbon emitting resources in the region's portfolio).		
4. Compel or assume state legislative action or action from jurisdictions outside New England (e.g. RGGI). Any state may, of course, wish to pursue state legislative action related to this matter, but any potential regional wholesale market adjustment should not presuppose state legislative action(s).		

FOLLOW-UP QUESTIONS ON AUGUST 11 PRESENTATIONS
(RECEIVED AS OF AUGUST 26, 2016)

<u>Questions on Forward Clean Energy Market (FCEM) Construct</u>

1) How would FCEM impact existing REC market? Would REC markets be needed under this concept? If not, does that imply that REC trading and long-term transactions are no longer needed? Please explain.

2) Bilateral markets complement centralized markets. Long-term PPAs as well as trading of products are used to transfer risk from those that are risk averse to those that have an appetite to manage risk. How would your proposal ensure that these activities still continue and complement the FCEM?

3) Can you please explain how an LSE would be able to hedge in this market? If this is an energy payment, is the difference paid out as up-lift? What if a generator over or under performs after clearing in the Forward Clean Energy Market? How will this provide accurate market signals that LSEs can use to hedge their load?

4) If the FCEM would create an annual product, would you contemplate having some set of common operational parameters around the delivery of the procured MWhs that would be settled in the auction, such that the product being sold in the market is consistent?

5) If one FCEM auction is held and all are paid the clearing price, won't states with low need for clean energy be paying much more than they should? Example: If state A needs 10 units of clean power and B needs 100. The clearing price of the auction will be based on 110 units. This price will be drastically higher than the clearing price for 10 units meaning A will be paying a much higher price than they should, based on their needs. Can you please react/explain?

6) If the resources clearing the clean energy auction are not obligated to enter the FCM, will this not result in double payment? Wouldn't ratepayers have to pay someone else to provide the capacity that the clean energy resources who don't participate could have provided at a potentially higher price?

7) What would be purchased in FCEM?
   a. Does the FECM only procure 100% zero-carbon MWs? For example, if there is a technology that can deliver, say MWhs with 10% of the carbon intensity of gas, does it qualify? Or does it have to be truly 0-carbon?
   b. How would biomass be treated as far as 0-carbon characteristics? Just the burning of the fuel, or life-cycle?
   c. How would municipal solid waste be treated? Is carbon avoidance a consideration?

8) What could the role of Energy Efficiency (EE) be in a Forward Clean Energy Market?

9) The presentations from August 11th seemed to have focused largely on the world of utility-scale generators. How might the FCEM concept being discussed in IMAPP include customer-sited generation? How might customer-generation be spurred on if they were able to participate in an organized market? Would this be an effective way to reduce escalating transmission costs by avoiding the need to move large amounts of clean energy across long distances to population centers?

Questions on Proposal for Clean Power Plant Solicitation (High Liner Foods Presentation)

1) Do qualified resources promise to forgo a portion of capacity revenues in return for a guaranteed make whole of their operating costs? (with a requirement to give back only 50% of energy revenues in excess of operating costs until they've returned the entire subsidy). If the RFP size is 4,100 MW, would you ever have any qualified resources that don't receive an award?

General Questions

1) What public policy is it that we are trying to integrate in this process? The terms "no carbon" and "renewable" were used interchangeably at the August 11 IMAPP meeting. Not clear if the goal is to change the markets to better accommodate the various public policies on increasing the use of renewable generation or reducing CO_2 emissions or both? This needs to be defined upfront as some of the proposals addressed only reducing CO_2 emissions and some addressed obtaining RPS and CO_2 reduction goals.

2) What are the implications of the Massachusetts' clean energy bill, *An Act to Promote Energy Diversity* (**H4568**), on the efforts underway in the NEPOOL IMAPP Process? How would the various market-based concepts/design proposals interact or be impacted by the Massachusetts' legislation?

End Use Customers' Perspective on IMAPP

PowerOptions
Cynthia Arcate, President & CEO
NEPOOL Meeting, August 30, 2016

Unique Perspective

- Provide guiding principles and observations of a group of end users: PowerOptions, Associated Industries of Massachusetts (AIM), The Energy Consortium (TEC) (all long-standing NEPOOL members)
- Together we represent most of the electricity consumption of C&I customers in Massachusetts
- PO is in the energy market daily, providing price quotes, including wholesale products, to its 500 members – not a one-size-fits-all program (do not take title to commodity)
- Unique perspective on the intersection of wholesale and retail markets
- Different perspective than suppliers – suppliers care about recovering costs – we care about reducing and managing costs

Perspective on IMAPP

- Support incorporating carbon reduction goals into wholesale market structure
  - Rather than trying to force incompatible state policy puzzle pieces into the market
- Preferable to state-mandated actions, which:
  - Will probably result in protracted and costly litigation
  - Will likely be more expensive than a regional market approach
  - Can contribute to cross-subsidies among states

Guiding Principle #1: Evaluate Impact on Retail Competition

- Robust wholesale market is necessary for efficient retail market – scope of review during IMAPP process must include evaluation on retail competition
  - When considering impact on load serving entities (LSEs), remember many are not utilities
  - Non-utility LSEs have less flexibility in passing on costs – hard to reflect in pricing leading to premiums
- Predictability and certainty of costs is critical
- Costs must be transparent – easily seen in retail pricing
- Important to keep suppliers on a level playing field with utility-supplied service
- Refund mechanisms are fundamentally flawed
  - Create intergenerational inequities (i.e. customers who contribute to refund pool may not be the ones receiving refunds, and vice versa)
  - Administratively burdensome

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Guiding Principle #2: Based on Region-Wide Emissions Goals

- Design market integration strategy based upon agreed-upon regional emission targets from electricity sector
- Do not have to fully satisfy each state's desired level of reductions
- The rest of each state's goals should come from other sources, e.g. transportation policy

Guiding Principle #3: Market Approach Should Replace State Policies

- A regional market approach can accomplish all or a subset of state goals
- To the extent goals are met regionally, state policies should be backed down, repealed or refocused on other sources
- Regional approach achieves least-cost approach to clean energy procurement by incorporating:
  - competition,
  - reliability,
  - operating efficiency,
  - and avoiding cross-subsidization among states, e.g. price suppression effect of single-state ratepayer subsidized projects benefit all consumers in region at expense of that state's consumers

Guiding Principle #4: Eliminate Future Need for Long-Term Contracts

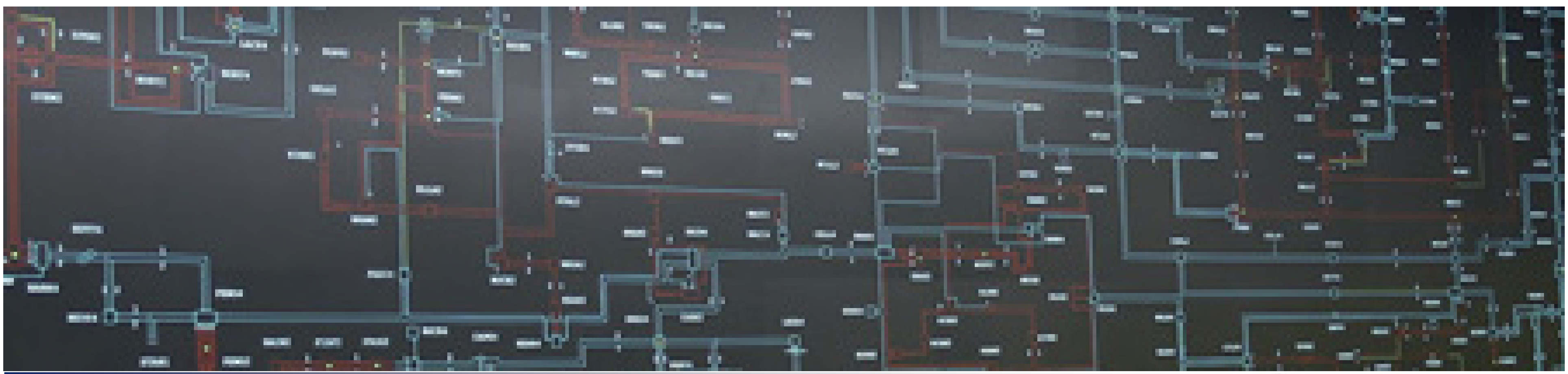
- Long-term contracts for renewables and other generation hinder price formation
- An efficient market should place all sources of generation on the same level of competition

Guiding Principle #5: Avoid Cost of Service Subsidies

- Any proposal must be market-based
- Subsidies are discriminatory and anti-competitive
- Reliability Must Run (RMR) era proves those types of contracts are cumbersome, unfair stopgaps that are ineffective in the long-term

Ongoing Role

- Look forward to working with other sectors to design integration approach consistent with these principles
- Welcome opportunity for input to provide unique perspective
- Intend to work with others in sector to broaden support



PowerOptions

Questions?

Consolidated Presentation on Forward Clean Energy Market

NEPOOL IMAPP Process

August 30, 2016

Why a Forward Clean Energy Market?

From "***Policy and Markets: Goal Posts***" (June 2016), available at http://www.nepool.com/uploads/IMAP_20160621_Goal_Posts_States.pdf:

"…The high-level market design objective associated with potential competitive markets-based solutions is to (i) ensure a sufficient revenue stream to incent the construction and operation of new resources that are able to satisfy some states' current and future policy requirements as reflected in state laws, and (ii) provide support if and to the extent needed to existing non-carbon emitting resources to enable their continued viability if one or more states conclude their customers should provide support to such existing resources in furtherance of their state(s)' policy objectives. …"

Forward Clean Energy Market intended to procure clean energy delivery commitments to efficiently achieve desired carbon emission goals.

Forward Clean Energy Market (FCEM)

Overview of Potential Construct:

- Similar to the existing Forward Capacity Market (FCM) construct, FCEM proposes the forward procurement of clean energy commitments through a competitive auction-based central procurement administered by ISO New England.
  - Requirements would be set by state policy
  - Would allow new clean resources to compete with existing clean resources
  - Market, payments and obligations would be governed and assured under a FERC-approved tariff

FCEM Details/Issues to Consider

1. What would be purchased?

- Clean, renewable, and/or other?
- Any-hour product v. time-differentiated product
  - E.g., off-peak, mid-day peak, and peak products; monthly, seasonal product?

2. How would procurement requirements be set?

- Dictated by the states based on public policies
- Locational, technology or vintage requirements/clearing constraints? (e.g., *x* MW of wind in NNE, *y* MW of off-shore wind in SNE)
- Need for/desirability of sloped demand curves?

FCEM Details/Issues to Consider (cont.)

3. Under what terms?

- How far forward? In advance of annual Forward Capacity Auction?
- Physical (like FCM) v. portfolio bidding (like LFRM)?
- One-year commitment; up to 7 years; 10+ years?
- FCEM Clearing Price = $/MWh? Other (i.e., guarantee of fixed cost recovery)?
- Payment per MW per year or per MWh with a fixed annual MWh quantity or other?
- Would there be a MOPR in the FCEM auction?

FCEM Details/Issues to Consider (cont.)

4. How would payments be determined?

- Upon delivery w/penalty for failure to deliver; payment separate from Real-Time energy settlement?
- Upon delivery; higher of FCEM auction clearing price or Day-Ahead or Real-Time LMP?
- Upon delivery; payment in form of adder to the Real-Time LMP?
- A fixed or floor component with a portion of Real-Time energy settlement as a production incentive?
- Other options?

FCEM Details/Issues to Consider (cont.)

5. What would be included in FCEM Offer Price Components?

- Should transmission costs be included as cost input?
- Cost of production and revenue requirement(s)
- Other inputs?

6. How would FCEM relate to FCM?

- Obligated to participate in FCM? Voluntary participation? Prohibited from FCM?
- FCEM payments treated as "in market" or "out-of-market" (OOM) for MOPR purposes?

FCEM Details/Issues to Consider (cont.)

7. How would FCEM interact with existing state-sponsored mechanisms (i.e., long-term PPAs)?

8. How would FCEM costs be allocated?

- Allocate FCEM charges to LSEs in states in accordance with individual state requirements?
- Allocate incremental cost difference between FCEM auction clearing price and applicable Day-Ahead or Real-Time LMP to LSEs in states in accordance with requirements?
- Other options?

FCEM Details/Issues to Consider (cont.)

9. Other Details, Issues or Questions to Consider??

Using Carbon Pricing in Dispatch to Meet the IMAPP Process Goals

August 30, 2016

Exelon.

Carbon Price Solution – Summary

- ISO and states work together to translate state carbon reduction goals into a schedule of year-by-year carbon emission goals for the ISO-NE footprint
- ISO determines carbon price necessary to meet carbon emission goals
  - Year 1 carbon price set at EPA social cost of carbon (~$47/ton in 2017)
  - Following year 1, ISO compares committed emissions to year 1 goals. If goals are met, carbon price for year 2 left unchanged. If goals are not met, carbon price is increased by an agreed-upon fixed increment (e.g. $5/ton)
  - This iterative process continues indefinitely
  - While carbon price may initially increase, feedback loops will dampen impact
    - ✓ Pass-through rate of carbon prices to wholesale energy prices will fall as low/zero carbon resources are increasingly on the margin, reducing consumer impact and mitigating "windfall profits" concern
    - ✓ Existing capacity and reserve markets will provide price signals necessary to maintain reliability and ensure a sufficient amount of fast-ramping and load-following resources
- ISO incorporates carbon price into energy market dispatch via an ISO-administered resource-specific, energy bid adder for carbon emitting resources
  - Reflecting the cost of carbon into energy dispatch = carbon price ($/ton) x emission rate for resource (tons/MWh)
  - Emitting resources pay the bid adder to the ISO, and the ISO remits the proceeds to LSEs, using an agreed-upon allocation approach that could accommodate differences in state goals
  - States may direct LSEs to use proceeds to offset customer costs or for other purposes (i.e., LIHEAP)

A carbon price is compatible with a forward clean energy market

- A carbon price raises energy prices in proportion to the marginal system carbon emissions
- If the carbon price is set at a level sufficient to fully compensate new entrant zero-carbon resources, a carbon price is all that is needed to achieve both state renewable goals and state carbon reduction goal
- A clean energy attribute procurement (FCEM) could, however, serve as a transitional overlay to a carbon price solution to ensure that the desired resources are procured, particularly if the carbon price is set at a level below that needed to fully compensate renewable entry:
  - Renewable attribute price would be set by "missing money" of marginal new entrant clean energy resource after bidders consider expected energy and capacity revenues
  - A carbon price will be incorporated into the expected energy price and by extension will reduce the amount of "missing money" on which clean energy resources set their bids
  - If the carbon price is set high enough, the clean energy procurement will clear at a price near zero. If the carbon price is set below this level, it will still reduce the clearing price for the clean energy procurement while producing additional benefits outside of the clean energy procurement process
- Over time, the FCEM could phase out as an adequate carbon price phases in or as renewable costs come down (or both).

A carbon price enhances forward clean energy procurement and provides additional benefits

A carbon price combined with a forward clean energy procurement provides benefits that cannot be achieved with a clean energy procurement alone:

1. By embedding some or all of the compensation for clean energy in the energy price, a carbon price reduces the size of the clean energy attribute payment necessary to attract new clean energy, while creating a revenue stream that can offset customer costs

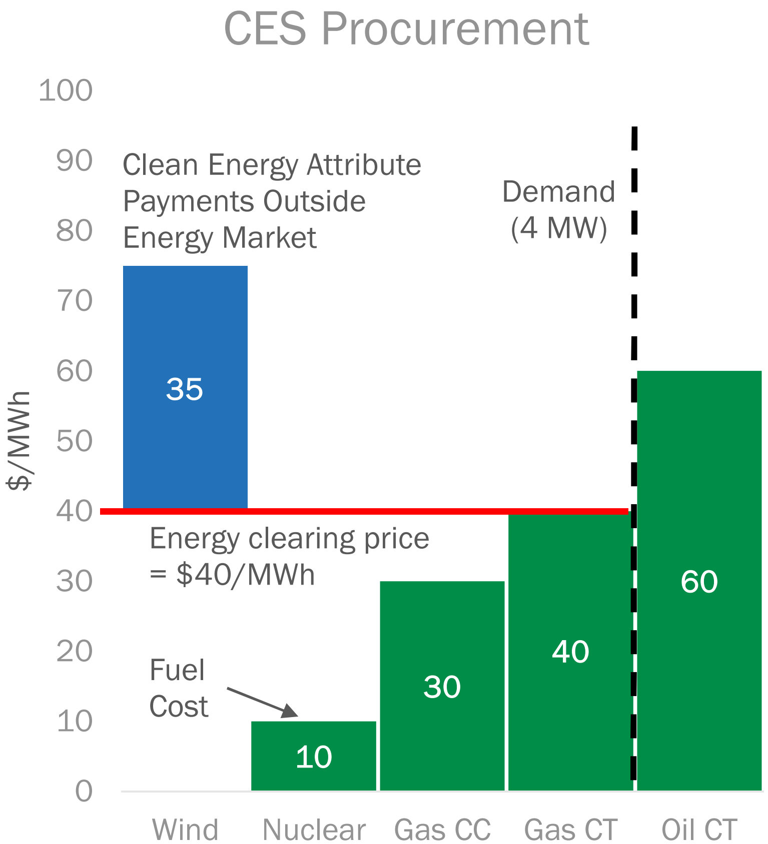
2. By reducing the attribute payment to clean energy resources, a carbon price reduces or even eliminates distortions in the energy market

3. A carbon price correctly prices the actual differential carbon abatement attributes of different zero-carbon resources and will thus better align the results of a clean energy procurement with actual carbon reduction

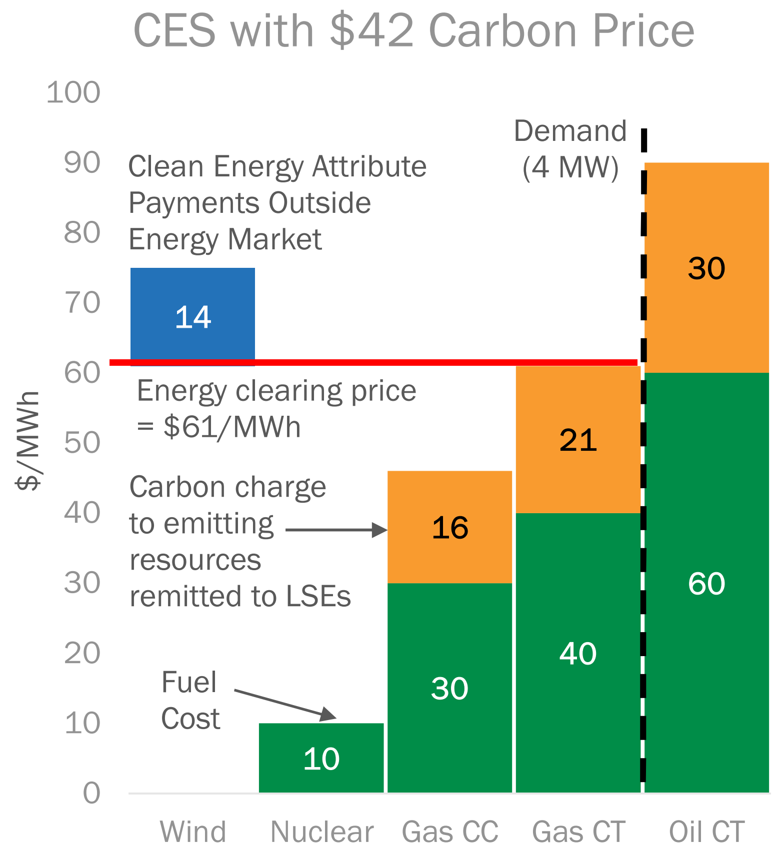
4. A carbon price recognizes the contribution of low-carbon resources, not just zero-carbon technologies (such as energy efficiency and highly efficient gas generation). The carbon price creates incentives for additional carbon abatement actions that are not addressed by a clean energy procurement

5. Depending on level, a carbon price can avoid the need to include nuclear and low-tier renewables within the clean energy procurement

By moving a portion of compensation to the energy market, a carbon price reduces the cost of clean energy attributes



	Gross Margin (Excluding Capacity):				
	Energy	Attribute	Carbon	Fuel	Total
Wind	40	35	0	0	75
Nuclear	40	0	0	(10)	30
Gas CC	40	0	0	(30)	10
Gas CT	40	0	0	(40)	0

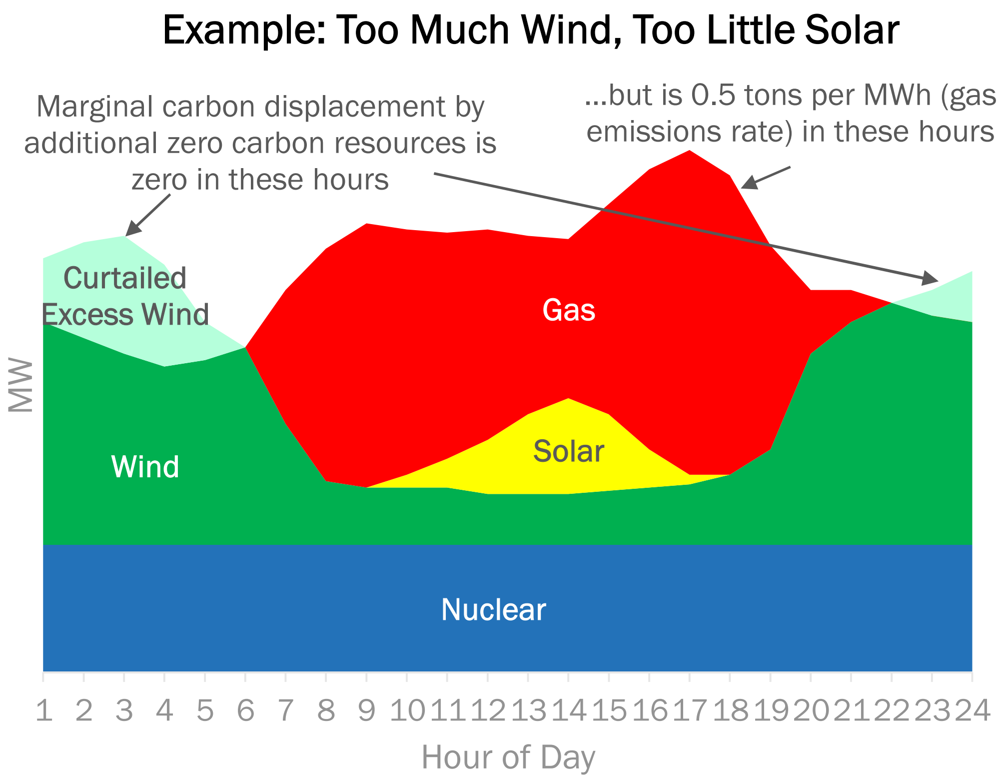


	Gross Margin (Excluding Capacity):				
	Energy	Attribute	Carbon	Fuel	Total
Wind	61	14	0	0	75
Nuclear	61	0	0	(10)	51
Gas CC	61	0	(16)	(30)	15
Gas CT	61	0	(21)	(40)	0

A carbon price reduces or eliminates energy market distortions

- Payments for energy production which do not flow through the energy market create an incentive for distorted energy market bids
  - For example, with a $35/MWh REC price, a wind generator is paid the energy price plus $35, and additionally generates a production tax credit worth another $35 in pre-tax terms for each MWh it produces
  - This generator will make money even with an energy price of negative $69/MWh, and will thus have an incentive to bid negative $70/MWh in the energy market to ensure it runs and receives its non-energy production-based payments
  - This effect is further compounded if instead of a REC-style attribute payment the resource receives a fixed contract price – the incentive in this instance will be to bid the negative of the contract price (plus the production tax credit) into the energy market
  - If state-supported resources are built in large enough quantities these distorted bidding incentives can create significant problems for the efficient commitment and dispatch of generating resources
- A carbon price reduces or eliminates the need for non-energy production-based payments, and thus diminishes or eliminates these potential problems

Zero-carbon resources are not necessarily equivalent and a carbon price correctly values the differences



	Marginal Carbon Passthrough Rate	Energy Uplift from $42/ton Carbon Price
Solar	0.50 tons/MWh	$21/MWh
Nuclear	0.35 tons/MWh	$15/MWh
Wind	0.20 tons/MWh	$8/MWh

The resource with the most marginal carbon abatement (solar) correctly receives the biggest benefit from the carbon price.

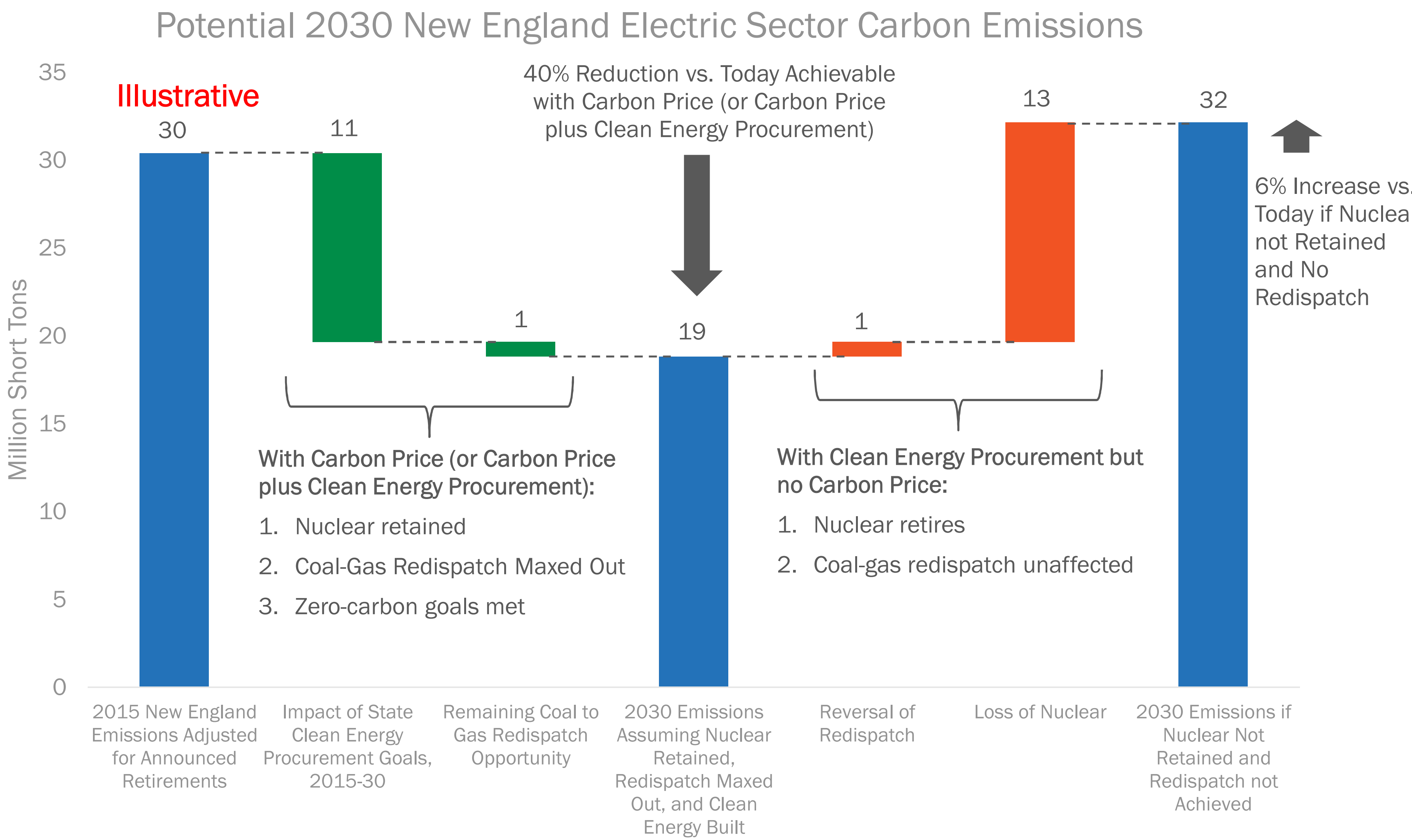
- Not all zero-carbon resources are equal in terms of their carbon abatement. Depending on production profile and existing supply stack there may be significant differences
- A carbon price correctly values these differences while a clean energy procurement on its own does not
- When a carbon price and FCEM are combined, resources with superior carbon abatement will be better compensated in the energy market, and thus will be able to offer more competitive bids in the FCEM

A price on carbon creates incentives for additional carbon-reducing actions

While a price on carbon provides incentives for zero-carbon resources, it is a broad-reaching solution that provides incentives for other carbon-abatement sources not addressed by a clean energy procurement:

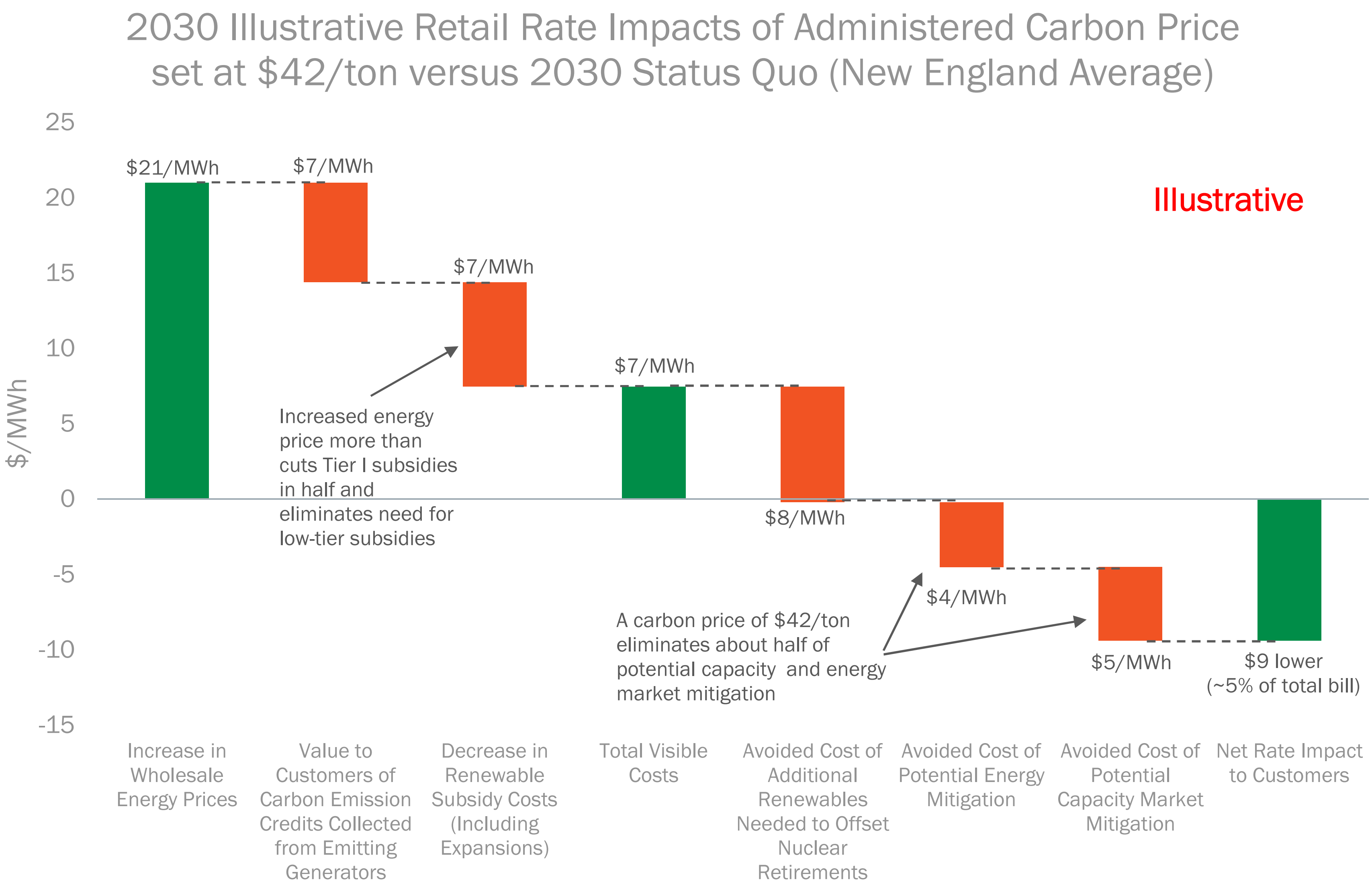
- Incentivizes re-dispatch in favor of lower emitting generators (such as gas CCGTs) over higher carbon generators (such as coal and oil)
- Provides appropriate price signals for nuclear to remain in the market
- Correctly prices the emission attributes of power imports
- Creates incentives that favor high efficiency, low-emissions technologies for new builds, uprates and retrofits versus resources with higher emissions rates.
- Provides correct emissions-related price signals sent to consumers in favor of energy efficiency and other consumer-side emissions abatement measures, particularly in conjunction with smart meter technology
- Provides immediate incentives for emerging zero/low carbon technologies which may not be covered by the procurement
- Provides correct emission-related price signals for investment in, and dispatch of, storage resources, particularly if carbon price is incorporated into ISO unit commitment decisions
- Provides correct emission-related price signals for behind-the-meter zero-carbon generators, with appropriate rate design

A carbon price enables nuclear retention and environmental re-dispatch, both of which are critical to reducing emissions



Assumptions: Utilizes 2015 RGGI emissions data adjusted for retirement of Brayton Point and Pilgrim. Does not include emissions from sources not covered by RGGI. Nuclear loss estimate includes impact of Seabrook, and Millstone shutdown. All carbon impacts estimated using 0.47 tons/MWh marginal emission rate.

With the overall result that a carbon pricing solution is actually much cheaper for customers over the long run than a current state bilateral contract model



Assumptions: 0.47 short ton per MWh marginal emission rate; 0.17 short ton per MWh average emission rate; baseline REC price of $35/REC; capacity market mitigation requires that additional non-subsidized capacity resources equal to UCAP value of subsidized resources be purchased.

Exelon.

Appendix

Methodology for Customer Cost Calculation (1)

Cost (Benefit) Category	Value ($/MWh)	Calculation Methodology
Increase in Wholesale Energy Prices	$21.0	= Carbon Price x Marginal Emission Rate x Wholesale-to-Retail Multiplier Where: • Carbon Price = $42/ton (Illustrative) • Marginal Emission Rate = 0.4705 tons/MWh. Based on ISO-NE 2014 Reported Marginal Emission Rate of 941 lbs / MWh for all locational marginal units from 2014 ISO-NE Air Emissions Report. • Wholesale-to-Retail Multiplier = 1.0611. Based on 2014 6-state retail load of 120 TWh as reported in EIA Electric Power Monthly and 2014 ISO Wholesale Load of 127.3 TWh as reported in 2014 CELT report. Retail-to-Wholesale multiplier = 127.3/120.0 = 1.0611.
Value to Customers of Carbon Emission Credits Collected from Emitting Generators	$6.6	= Carbon Price x Projected 2030 Emissions / Retail Load Where: • Carbon Price = $42/ton (Illustrative) • Projected 2030 Emissions = 18.8 million short tons. Based on 2015 New England Emissions of adjusted downward for new renewables and redispatch. See slide 8 for illustration. • Retail Load = 120 TWh (see above)

Methodology for Customer Cost Calculation (2)

Cost (Benefit) Category	Value ($/MWh)	Calculation Methodology
Decrease in Renewable Subsidy Costs	$6.9	= (2030 Tier 1 Renewable Target x Carbon Price x Marginal Emission Rate + 2030 Low-Tier Renewable Target x Low-Tier REC Price) / Retail Load Where: • Carbon Price = $42/ton (Illustrative) • Marginal Emission Rate = 0.4705 tons/MWh. See Previous Slide. • 2030 Tier 1 Renewable Target = 37.1 TWh. Based on scheduled 2030 Tier 1 RPS Targets of 27.5% for MA, 20% for CT, 31% for RI, 8.8% for VT, 24.8% for NH, 10% for ME multiplied by relevant state-level retail load, plus 9.45 TWh of incremental renewables associated with MA H. 4568 • 2030 Low-Tier Renewable Target = 9.8 TWh. Based on Scheduled Low-Tier RPS Targets of 3.5% for MA, 7% for CT, 62.2% for VT, 20% for ME. Low-Tier renewables include tiers that cover resources generally not eligible for Tier 1 such as large-scale hydro and certain types of biomass. • Low-Tier REC Price = $10/MWh. Assumed value based on low-tier REC alternative compliance payments. • Retail Load = 120 TWh. See Previous Slide.
Avoided Cost of Additional Renewables Needed to Offset Nuclear Retirements	$7.8	= Nuclear Output at Risk x Tier 1 REC Price / Retail Load Where: • Nuclear Output at Risk = 26.6 TWh. Projected annual output of Millstone 2 and 3 and Seabrook (3,380 MW total) at 90% capacity factor. • Tier 1 REC Price = $35/MWh. Based on recent Tier 1 REC price for MA and CT as published in Megawatt Daily. • Retail Load = 120 TWh. See Previous Slide.

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Methodology for Customer Cost Calculation (3)

Cost (Benefit) Category	Value ($/MWh)	Calculation Methodology
Avoided Cost of Potential Energy Mitigation	$4.3	= (Price Impact of All Potential Subsidized Resources x Fraction of Energy Market Not Subsidized + Price Impact of All Potential Subsidized Resources x Fraction of Energy Market Subsidized x 0.5) x (Fraction of Mitigation Avoided) Where • Price Impact of All Potential Subsidized Resources = $12/MWh. Based on internal modeling of replacement of 73 TWh of subsidized infra-marginal resources with non-subsidized gas resources • Fraction of Energy Market Not Subsidized = 42% • Fraction of Energy Market Subsidized = 58% • Fraction of Mitigation Avoided = 51% This assumes that energy price impact of subsidized will be restored to on-subsidized resources that still clear the market, and that non-subsidized resources that would otherwise have cleared the market are paid their lost energy margin.
Avoided Cost of Potential Capacity Mitigation	$4.9	= (Low-Tier Renewable Capacity + Nuclear Capacity) x Net CONE x (12/1000) / Retail Load Where • Low-Tier Renewable Capacity = 1,122 MW. Based on 9.8 TWh of Low-Tier renewables receiving UCAP credit at 100% of average hourly output • Nuclear Capacity = 3,380 MW • Net CONE = $10.81/kw-mo • Retail Load = 120 TWh. See previous slides. This assumes that mitigation requires that capacity effectively be purchased twice for the mitigated capacity: once by removing this capacity from the market, and once by making up for the loss of capacity revenues via further subsidy payments

Exelon.

NEPOOL IMAPP Stakeholder Discussion August 30, 2016

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

Two-Tier Pricing

Pete Fuller

I. Objectives and Context

Market & policy design goals

1. Ensure that the Forward Capacity Market continues to support investment in existing and new resources where and when needed, while accommodating State actions to meet carbon goals.
2. Explore a market-based forward procurement strategy for renewable generation resources to improve overall investment efficiency.

These goals are initial steps towards establishing the market mechanisms necessary to competitively deploy clean energy *MWh* and *MW*

Challenge: to create an investment climate that supports the "4 Product Future"

'4 product future'

1 

Renewables

- ✓ Renewables will provide the vast majority of energy needed by consumers. Utility-scale renewables growth will track strongly along existing (and expanding) state RPS targets. Distributed renewables will also grow, enabled by rate design, state policies, consumer demand and improving economics.

2 

Storage

- ✓ Utility-scale or commercially-sited energy storage can balance variable renewables generation and manage peak demands while providing critical grid support products (e.g. ancillaries).

3 

Controllable demand

- ✓ Smart, controllable loads, e.g. connected water heaters, will become pervasive in end-use devices and can address capacity / demand-shift challenges imposed by high penetrations of weather-dependent renewables. This will provide value to customers and the grid.

4 

Fast-ramping gas

- ✓ Fast-start gas capacity can provide flexible, dispatchable capacity to ramp as needed to balance renewables.

IMAPP solution set

- ✓ **Carbon Shadow Pricing** – enhances energy market revenues for non-emitting resources in the near term.
- ✓ **Forward Clean Energy Market (FCEM)** – Potential market-based structure for financing new renewables.
- ✓ **Two-tier Pricing in the Forward Capacity Market (FCM)** – maintains price signals and revenue for existing and needed new conventional resources during market transition.

Today's presentation focuses on the context and market mechanics underpinning two-tier pricing in the FCM

II. Why Focus on the Capacity Market?

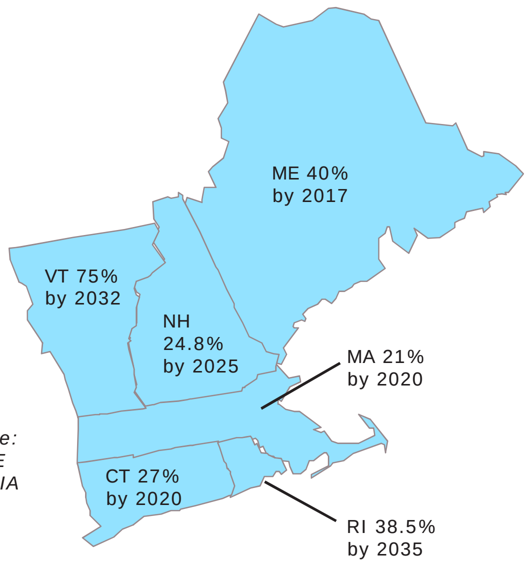
Capacity markets are critical for enabling a clean energy future

- ✓ ISO-NE states have ambitious renewable energy deployment and carbon reduction targets (e.g. MA's Global Warming Solutions Act).
- ✓ Public policy generally focuses on deploying zero-carbon, renewable *MWh* – however, equally important are *dispatchable*, high-performance capacity resources – *MW* – necessary for operational security and reliability in a renewables-centric power system. Capacity markets are the primary tool for competitive capital allocation to drive investment in these dispatchable, clean MW.
- ✓ Capacity markets must also support existing resources as long as they are needed and enable investment in economic conventional and renewable resources. Over time, FCM (perhaps complemented by FCEM) should become the vehicle for financing all resources, including renewables.

Two-tier pricing is a necessary mechanism as markets evolve to transition today's fleet into a mix of renewables and storage complemented by flexible, fast-ramping resources

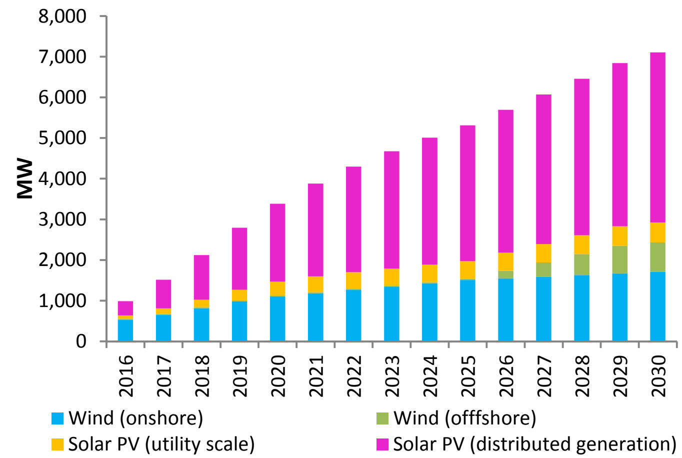
New England states have ambitious goals for deploying renewables

New England Renewable Portfolio Standards (RPS), by state and year



Source: *DSIRE and EIA data, 2016*

Est. renewable capacity additions in ISO-NE, by resource and year



Source: Data from IHS CERA North America Power Market Fundamentals Rivalry Apr 2016, assumes state RPS goals and eventual federal climate policy post-2025.

- ✓ The combined New England state RPS targets are projected to comprise a minimum of **28% of the region's retail sales coming from renewable sources in 2030-2035**. Based on 2015 EIA data and ISO-NE generation data, renewable energy represents **8% of ISO-NE states' total retail sales in 2015**.

- ✓ By 2030, additional renewable capacity could equal 23% of ISO-NE's 2015 capacity base, according to some estimates.

As renewables become the dominant form of generation in the power system, the capacity market will become more important

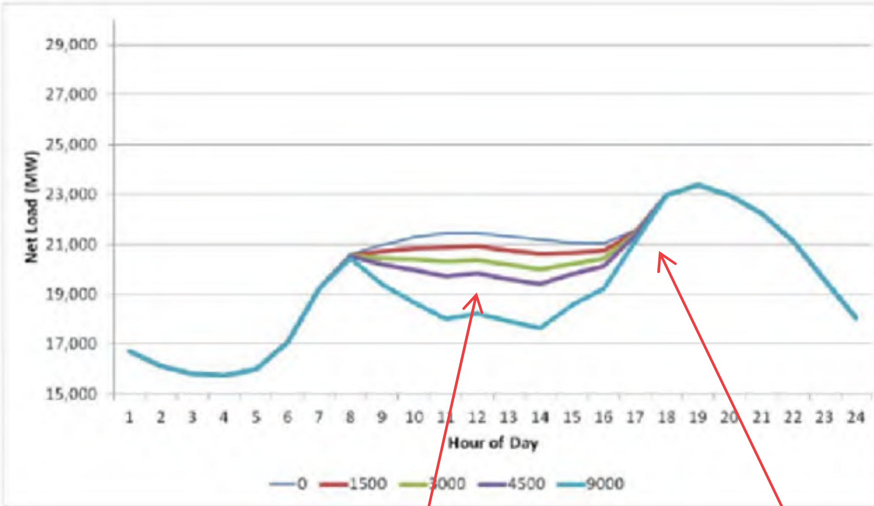
States continue to pursue out-of-market contracts

- ✓ While an FCEM may ultimately fund development of renewables, New England states are currently engaged in pursuing long-term contracts for renewable energy resources.
- ✓ Such contracts include a three-state RFP for up to 5 TWh/yr (or more) of clean energy; perhaps as much as 1,900MW.
- ✓ Massachusetts' new statute calls for 9.45 TWh/yr of clean energy and 1,600MW of off-shore wind.
- ✓ Without a mechanism to protect FCM price formation, these contracts could cause significant price suppression, dampen investment signals for new fast-start resources, and lead to premature retirements with long-lasting consequences as we transition to FCEM and a renewables-centric fleet.

Successful renewables integration requires new investment in fast-start, flexible capacity

- ✓ Increased penetration of renewables will reshape supply-demand dynamics in the power system, such that net load ("load minus renewables") drops during the day and overnight, and relatively peaks during earlier morning and later evening hours.
- ✓ California's renewables-centric load shapes are not exclusively a West Coast phenomenon. The chart shows what an emerging East Coast "duck" curve might look like in New York.
- ✓ Fast-start, flexible capacity resources are necessary for backing-up a renewables-centric power system.
- ✓ A high performance, gas-fired, capacity 'backbone' is a necessary component of a renewables-centric, low-carbon future.

From the "Duck" to the "Platypus":
NY Winter Net Load with Levels of Solar Integration (MW)
(3,000 MW penetration represents NY-Sun 2024 target)



Source: NYISO's Solar Integration Study

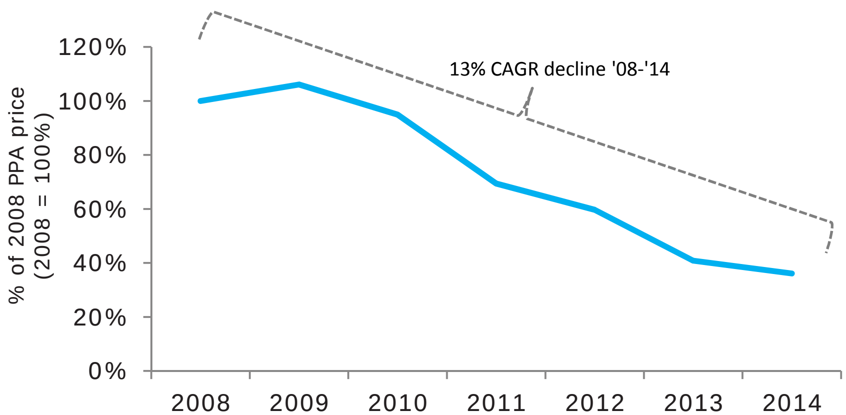
Increasing quantities of solar generation relative to load reduces net load, dampening wholesale prices.

Post-sundown solar drop-off, and increased demand, results in fast-start, flexible capacity resources.

Capacity markets will need to facilitate investment into high-performance, flexible MWs to support renewables

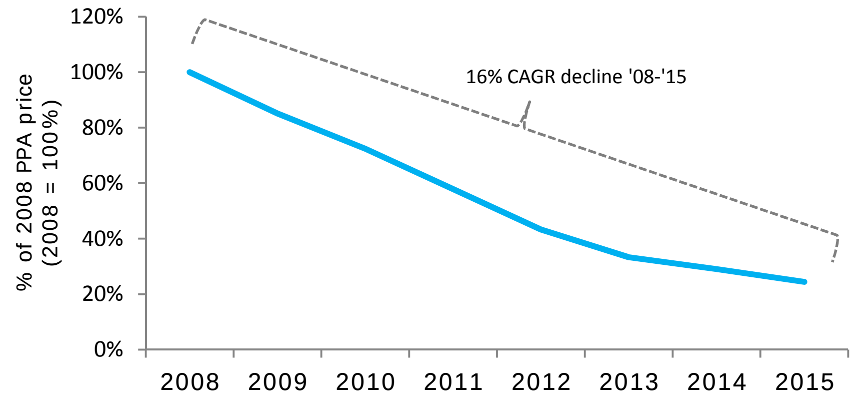
Ongoing cost declines bode well for new, innovative financing mechanisms for renewables – like the FCEM

Generation-weighted levelized wind PPA prices as a percentage of the 2008 price
by year of PPA execution date, national avgs



Source: LBNL, NREL data

Generation-weighted levelized solar PV PPA prices as a percentage of the 2008 price
by year of PPA execution date, national utility-scale avgs



Source: LBNL, NREL data

As technology costs continue to decline, FCM and a potential FCEM could become viable paths to finance new renewables

III. Two-Tier Pricing

Rationale behind a two-tier capacity market proposal

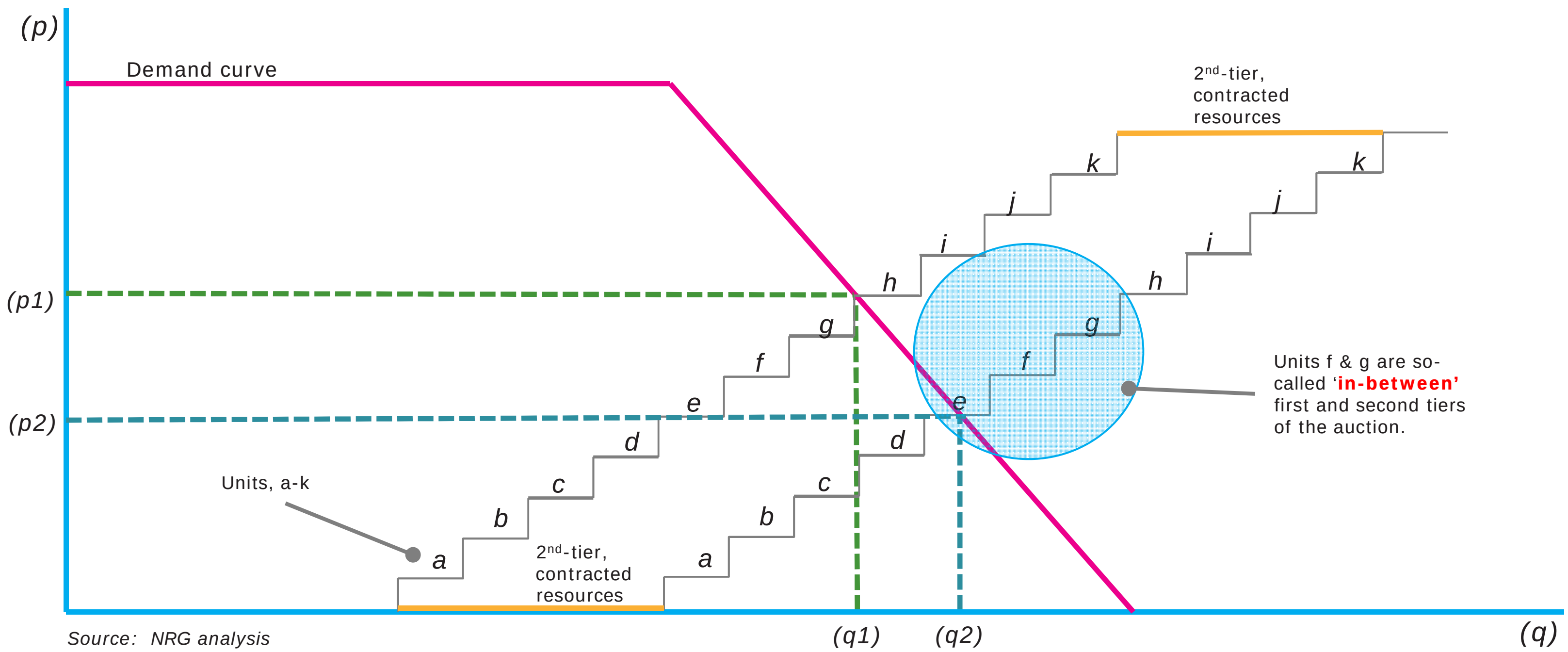
Goals:

- ✓ Create a financeable capacity market structure that continues to incent investment when and where needed, even as state-contracted resources proliferate.
- ✓ Ensure that resources relying on market revenues receive adequate revenues to maintain reliability.
- ✓ Allow state-contracted resources to assume a CSO and contribute to meeting net ICR, while recognizing that their fixed-cost recovery is coming from outside the market.
- ✓ Ensure that all resources have similar performance obligations.

Two-tier pricing supports existing and needed new investment and provides states the flexibility to contract to meet carbon goals, while evolving toward competitive, in-market entry by renewables

Mechanics of two-tier pricing – NRG Proposal

- ✓ The capacity auction would occur in two stages. All resources, including resources receiving out-of-market contracts to support state policy goals, would be subject to offer price mitigation in the 1st stage. The 1st stage of the auction would clear a quantity q1 at price p1 in the diagram below.
- ✓ In the 2nd stage, any resources receiving out-of-market revenues and not cleared in the 1st stage would be entered into the auction as price-takers, but with no changes to other resources' offers. The second stage would establish a clearing price p2.
- ✓ Resources receiving out-of-market revenues that did not clear in the 1st stage of the auction would get paid p2; all other resources that cleared the 1st stage would get paid p1.
- ✓ All resources may be subject to pro-rating to manage auction quantity and cost (see subsequent slides).
- ✓ Offer floor mitigation would apply in subsequent years to resources receiving out-of-market revenues until the resource clears in a 1st–stage auction.



Source: NRG analysis

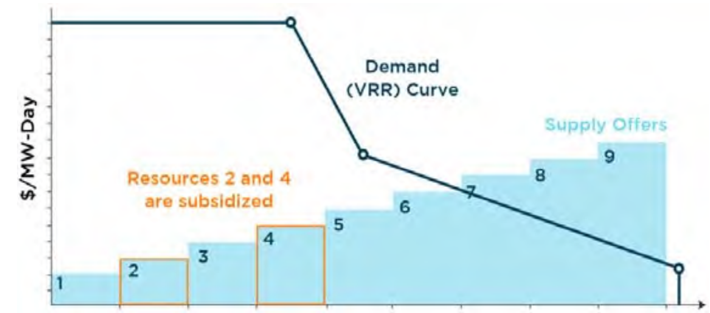
PJM has also discussed capacity market reforms, and offered a version of two-tier pricing

- ✓ To accommodate both state policy goals and competitive markets, PJM has released a discussion proposal that includes a two-tier pricing mechanism.
- ✓ PJM's proposal seeks to balance several aspects that underlie the changes necessary ahead to establish a low-carbon power system:
    - o Enable states to pursue public policy objectives;
    - o Protect price formation / competitive signals in power markets;
    - o Avoid or manage the over-procurement of energy resources.
- ✓ NRG agrees with these goals, though we arrive at different design choices to achieve them.

High-level summary of PJM's capacity proposal offered during Grid 20/20

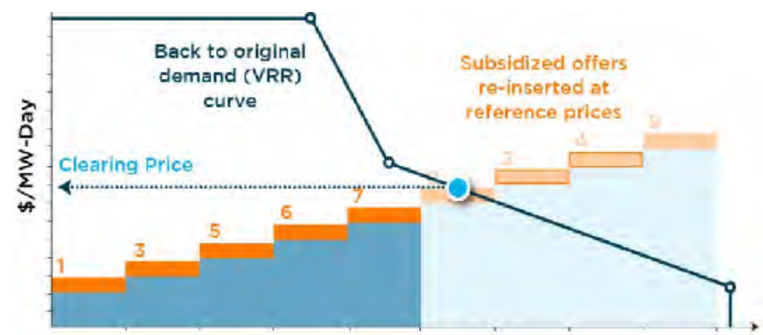
(Source: PJM Grid 20/20 slides)

Identify 'subsidized' resources during capacity auction



Shifted demand curve clears against reorganized supply stack

Subsidized resources re-inserted at reference prices



Design considerations for two-tier pricing

NRG analysis, PJM proposal, and market participant feedback have identified several design aspects to explore:

- ✓ The application of offer floor mitigation.
- ✓ Mechanics of the auction; constructing the offer curve; clearing demand.
- ✓ Treatment of ‘in-between’ resources.
- ✓ Interaction of FCM with FCEM for pricing, offer incentives, mitigation and price formation.

Application of Offer Floor Mitigation

NRG's perspective: to fully develop a clearing price without price impacts of state policy (SP) contracts, offer floor mitigation would apply to all resources (new and existing) that receive 'out-of-market revenues' as defined in ISO-NE MR1 Appendix A.21:

> "Out-of-market revenues are any revenues that are: (a) not tradable throughout the New England Control Area or that are restricted to resources within a particular state or other geographic sub-region; or (b) not available to all resources of the same physical type within the New England Control Area, regardless of the resource owner," or
>
> "supported by a regulated rate, charge, or other regulated cost recovery mechanism"

SP Resources would be subject to offer floor mitigation in subsequent auctions until cleared at the 'P1' price.

- ✓ Replace RTR Exemption with two-tier pricing; including elimination of the 200MW/600MW caps

Other options or points for consideration?

Auction mechanics

NRG's perspective: Using the unadjusted demand curve produces the most accurate pricing; pro-rating for in-between resources reduces risk and maintains incentive for marginal cost offers

Other points for consideration:

- ✓ Clear against the full demand curve, or an adjusted curve (as proposed by PJM)?
- ✓ Ensuring incentives for submittal of competitive offers:
  - o Descending clock vs. sealed-bid?
  - o Incentives to shade offers to clear at the lower price and get paid the higher price?
  - o Order of establishing price with and without the state policy resources as price-takers?
- ✓ Others?

Treatment of In-between Resources

NRG's perspective: Two-tier pricing creates a set of resources that would clear at the higher price but not at the lower price (the 'in-between' resources). The potential for these resources to receive *no* CSO even though the clearing price is above their offer creates risk and distorts offer incentives. Pro-rating for in-between resources reduces risk and maintains incentive for marginal cost offers

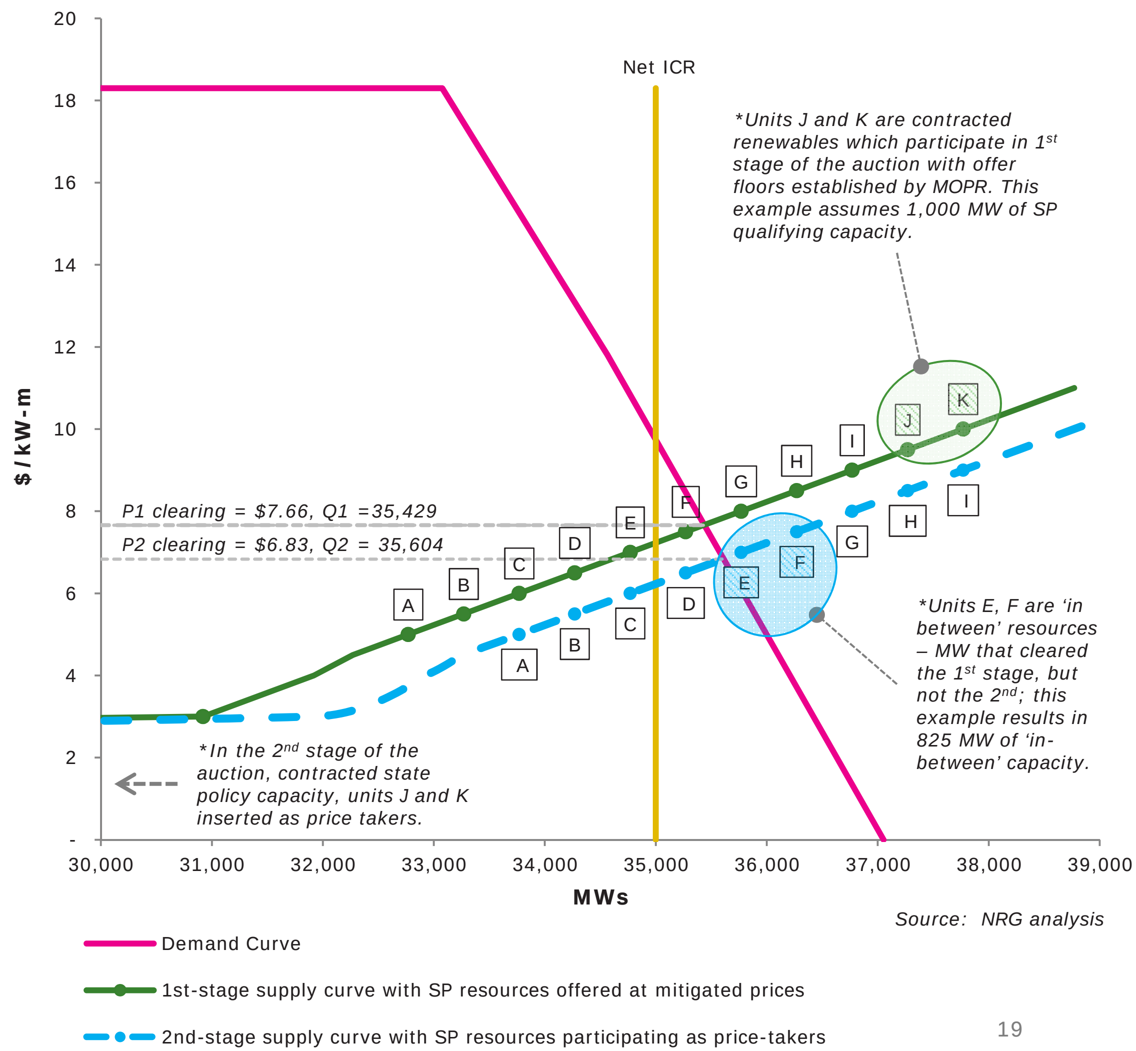
Other points for consideration:

- ✓ Award a full CSO to in-between resources?
- ✓ Award no CSO to in-between resources (as proposed by PJM)?
- ✓ Pro-rate quantity? Pro-rate price?
- ✓ What is the 'basis' for pro-rating: total market cost? Total market quantity? Some other benchmark?
- ✓ Others?

An example for considering in-between resources

- ✓ With full application of mitigation, i.e., all resources offering at a competitive level, 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/kW-mo x 35,429MW = $3,257 million
- ✓ With 1,000MW of State Policy (SP) Qualified Capacity inserted as price-takers in the 2nd stage, the clearing price is $6.83/kW-mo, and the cleared quantity is 35,604MW
  - o Because of the slopes of the supply and demand curves, the in-between resources in this example are 825MW, less than the 1,000MW of SP resources
- ✓ The total (market) cost of the second stage would be $6.83/kW-mo x 35,604MW = $2,918 million
  - o This is the price-suppression effect of out-of-market capacity
  - o Out-of-market payments to SP resources would be an additional cost to consumers.

Illustrative two-tier auction pricing

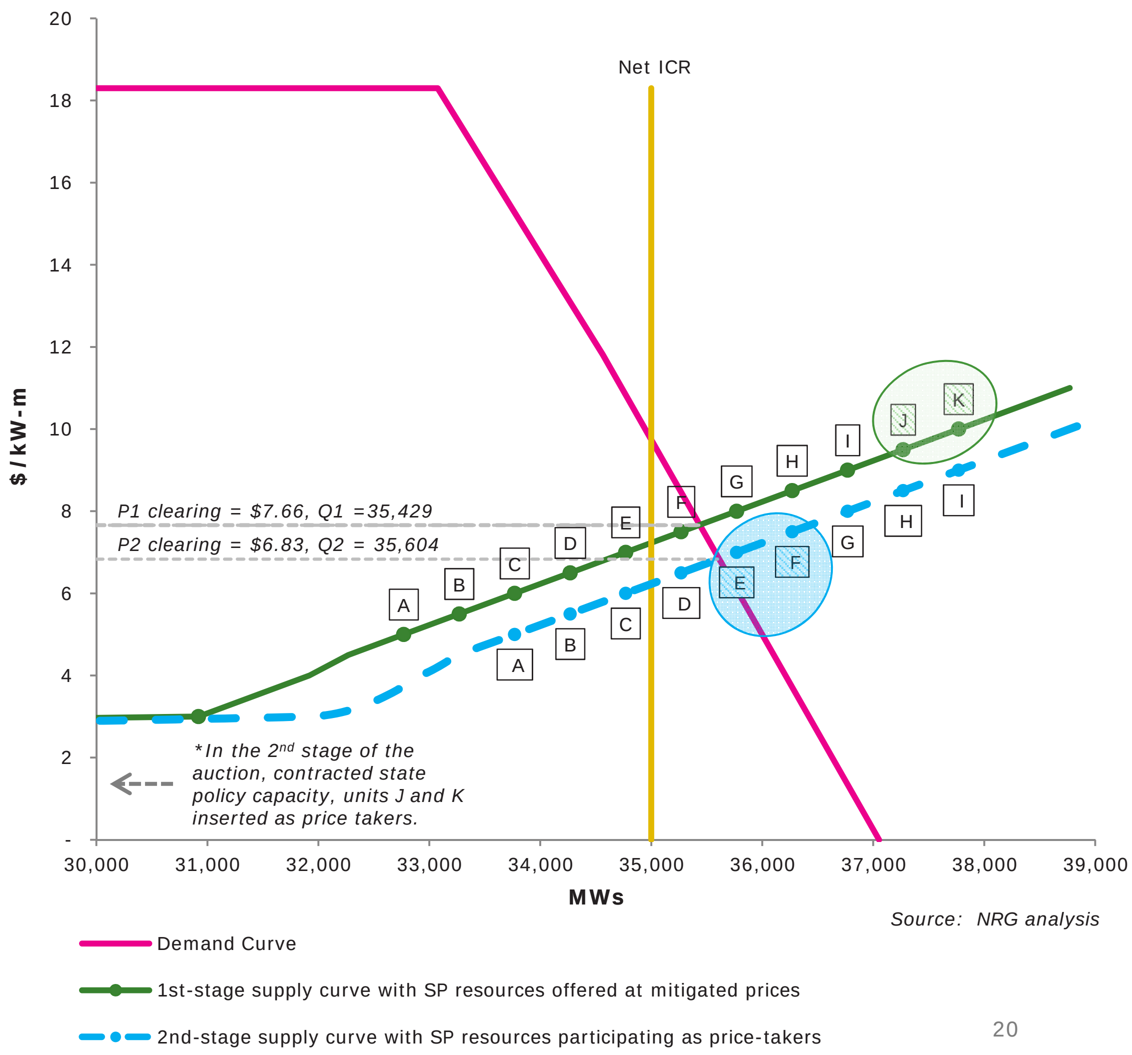


Source: NRG analysis

Treatment of in-between resources – one ‘bookend’

- ✓ At one extreme, all ‘in-between’ resources would get a full CSO
- ✓ The total (market) cost for this approach is:
  - o (P1 X Q1) + (P2 x Q*sp*), or
  - o ($7.66/kw-mo x 35,429MW) + $6.83/kW-mo x 1,000MW) = $3,339 million
- ✓ In this approach, the market purchases more capacity than specified by the demand curve at either P1 or P2, and results in a higher cost than the ‘fully mitigated’ market
- ✓ The out-of-market payments to SP resources would be an additional cost to consumers

Illustrative two-tier auction pricing

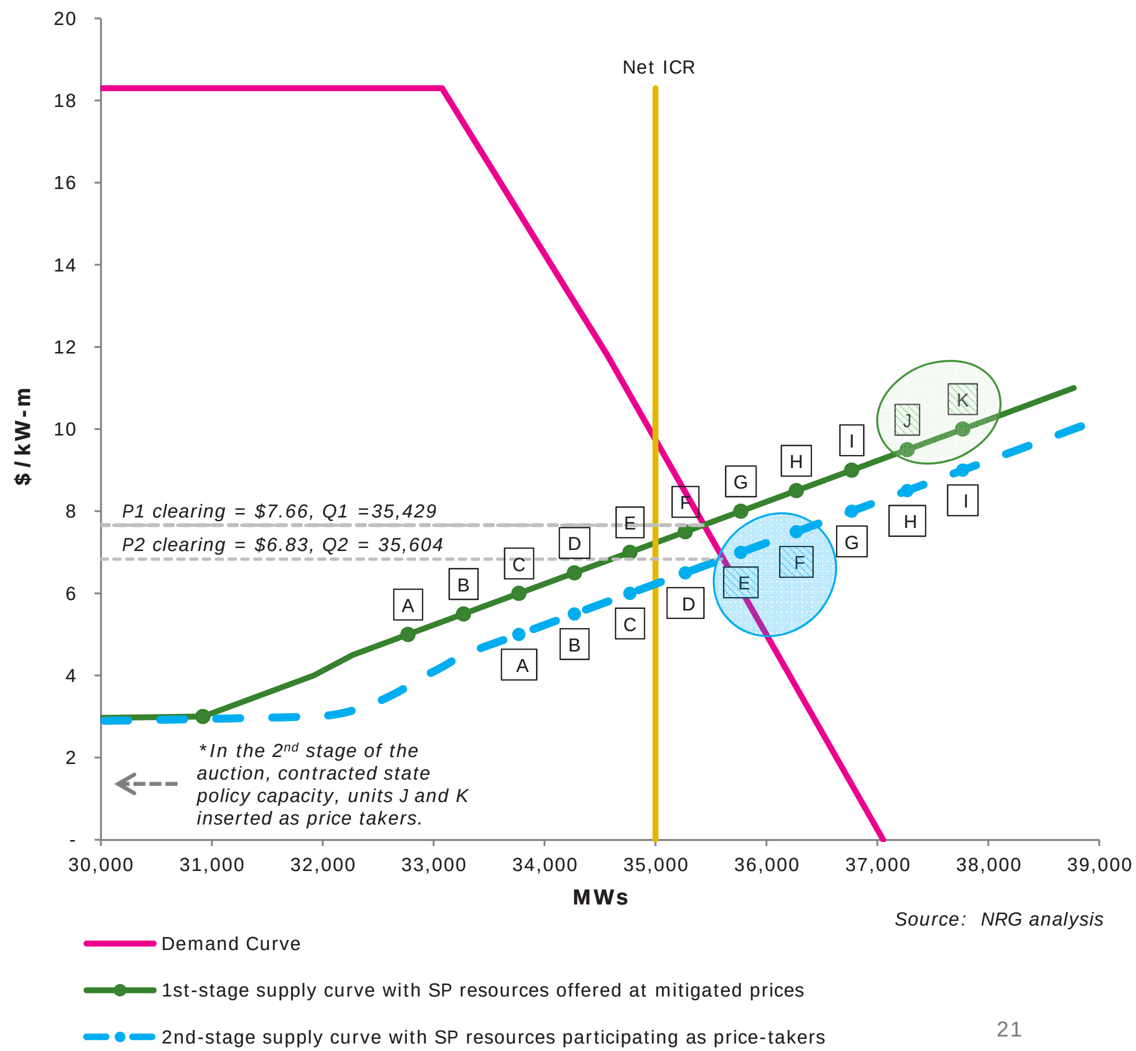


Source: NRG analysis

Treatment of in-between resources – the other 'bookend'

- ✓ At the other extreme, there is no CSO awarded to 'in-between' resources.
- ✓ If the 825 MW of in-between capacity of Units E & F receives no CSO, the total (market) cost would be:
  - o (P1 x (Q1 – Q*in-between*)) + (P2 x Q*sp*), or
  - o $7.66/kW-mo x (35,429-825)MW + $6.83/kW-mo x 1,000MW = $3,263 million
- ✓ This approach leads to higher risk for resources anticipating being 'in-between,' which is likely to show up in offer behavior.
- ✓ If a resource's actual marginal costs are anticipated to be between P1 and P2, creates incentives to reduce offer to get below P2 in order to receive P1, which could affect price formation for P1 as well as for P2.
- ✓ The out-of-market payments to SP resources would be an additional cost to consumers

Illustrative two-tier auction pricing

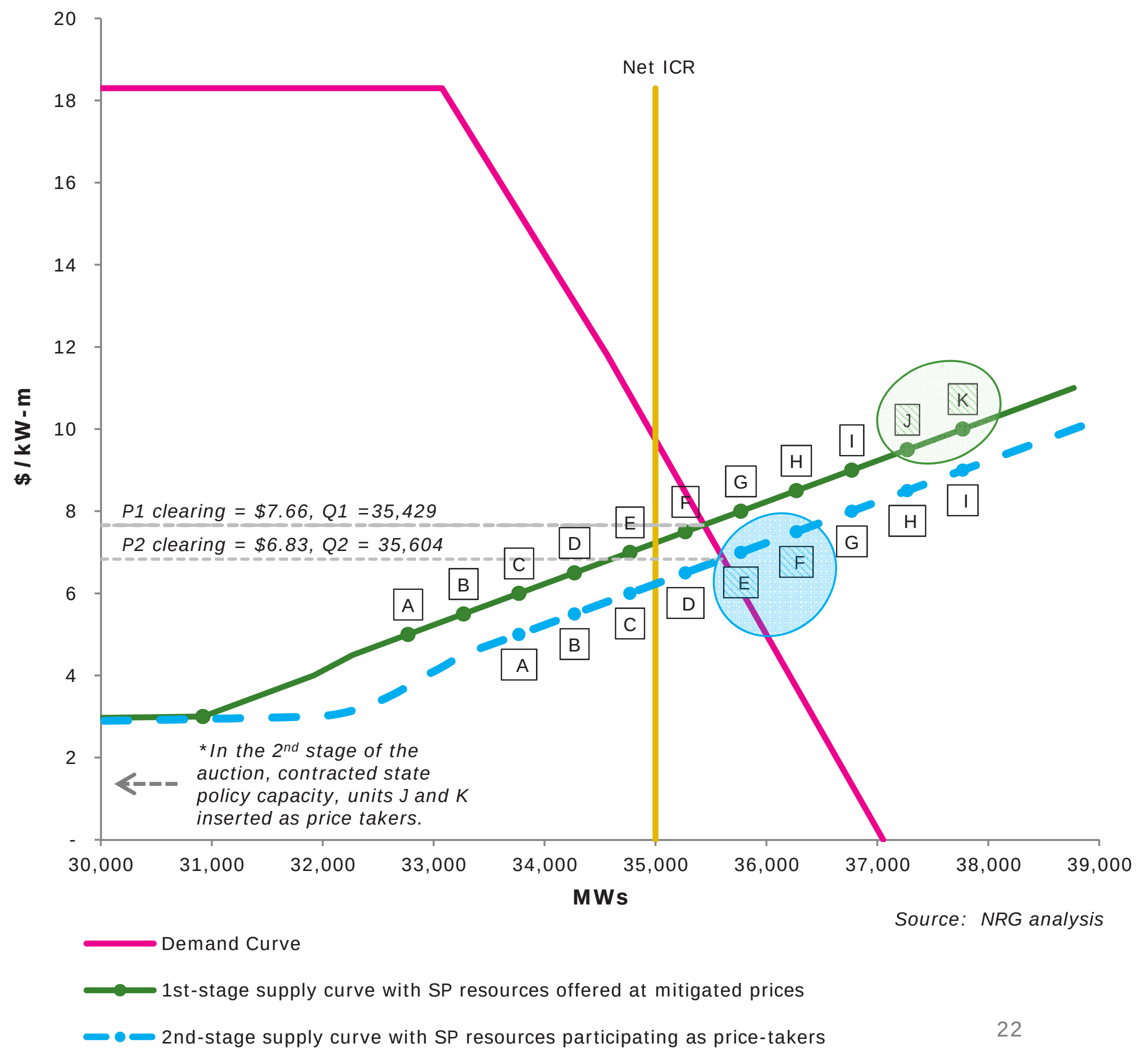


Source: NRG analysis

Treatment of in-between resources – a middle option

- ✓ One approach to managing over-procurement is to pro-rate CSO quantity for all resources cleared at P1 and all SP resources.
  - For example, pro-rate all CSO awards so that the resulting total (market) cost is equal to the mitigated case, P1 x Q1
  - In our example, the pro-rating factor would be 3,257/3,339 = ~97.5%. A 100MW resource would receive a 97.5MW CSO.
- ✓ All resources being paid in the capacity market share the cost of the additional quantity purchased
- ✓ Other pro-rating approaches could be chosen, e.g., limiting total quantity to no more than the quantity that would clear at P2, or perhaps some other benchmark.
- ✓ Pro-rated quantity would be eligible for reconfiguration auctions, including SP resources that have not yet cleared at P1.

Illustrative two-tier auction pricing



Source: NRG analysis

Treatment of in-between resources – summary comparison

- ✓ **NRG's perspective:** Either of the 'bookend' approaches has clear negative impacts; to avoid or mitigate those impacts, NRG recommends a middle course.
- ✓ Two possible approaches to pro-rating CSO awards are illustrated here; there are others that could be explored

CSO award Options	Total Quantity Purchased (MW)	Total (Market) Cost
Full mitigation of OOM Resources	Q1 35,429	35,429MW x \$7.66/kW-mo = \$3,257 million
Option 1: *CSO for all resources*	Q1 + *Qsp* 35,429 + 1,000 = 36,429	35,429MW x \$7.66/kW-mo + 1,000MW x \$6.83/kW-mo = \$3,339 million
Option 2: *No CSO for in-between*	(Q1 – Q*in-between*) + *Qsp* (35,429 - 825) + 1,000 = 35,604	(35,429 - 825)MW x \$7.66/kW-mo + 1,000 x \$6.83/kW-mo = \$3,263 million
Option 3A: *Pro-rate MW to limit total costs*	(Q1 + *Qsp)* x (3,257 / 3,339) (35,429 +1,000) x 0.975 = 34,559 + 975 = 35,535	34,559MW x \$7.66/kW-mo + 975MW x \$6.83/kW-mo = \$3,257 million
Option 3B: *Pro-rate MW to limit total quantity*	Q2 = 35,604MW Pro-rate Q1 and *Qsp* by Q2 / (Q1 + Qsp) 35,604 / (35,429 + 1,000) = 97.7%	(35,429MW x 0.977) x \$7.66/kW-mo + (1,000 x 0.977) x \$6.83/kW-mo 34,627MW x \$7.66/kW-mo + 977MW x \$6.83/kW-mo = \$3,263 million
Others?		

Interaction of FCM and FCEM

Some points for consideration:

- ✓ Both markets are intended to support fixed cost recovery and enable cost-effective financing
- ✓ Which market clears first? Are FCEM resources required to / able to / prohibited from participating in FCM? How are rational offers established in each market? Does clearing in one market depend on clearing in the other?
- ✓ Are FCEM revenues treated as 'in-market' revenues for FCM mitigation (or vice-versa)? What are the implications of including/excluding these revenues for mitigation purposes?
- ✓ Others?

Questions?

clf
conservation law foundation

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August 23, 2016

By Electronic Mail

NEPOOL Participants Committee
c/o Patrick Gerity
Day Pitney LLP
242 Trumbull Street
Hartford CT 06103

Re: Additional Proposal for Consideration at August 30 IMAPP Meeting

Dear Patrick,

NEPOOL Member Conservation Law Foundation ("CLF") submits these additional proposals and requests time to present them to the Participants Committee IMAPP group (the "IMAPP Working Group") during its already-scheduled Aug. 30 meeting:

> Additional Proposal 1: *CLF proposes that, before further considering any substantive IMAPP proposal – i.e., any specific proposal for new pricing in, or rules for, an existing ISO-NE market(s) or for the establishment of any new ISO-NE market(s) — the IMAPP Working Group should formulate a short and clear consensus statement of the specific objective(s) of the IMAPP effort.*
>
> Additional Proposal 2: *CLF proposes that NEPOOL request a legal opinion from NEPOOL counsel (Day Pitney LLP) regarding the anticipated legal basis for an ISO-NE Section 205 filing in support of proposals contained in the anticipated IMAPP Working Group Framework Documents.*

Relevant Context of Proposals: A range of possible, and potentially conflicting, goals and objectives for the IMAPP effort have been articulated by NEPOOL leadership and by members in their Aug. 11 presentations. Those goals range from: generally "accommodate[ing] public policies" including, among others, "carbon-emissions reductions [and] fuel diversity" without "unreasonably increasing the cost to consumers"[1] to "integrat[ing] into our wholesale markets new criteria" that will, in addition to existing requirements for achieving least-cost grid

[1] NEPOOL, *Policies and Markets Problem Statement* (May 17, 2016), at 1.

conservation law foundation

reliability, result in "decarbonizing [ISO-NE] over time."[2] That broad range of possible IMAPP scope was further broadened, rather than narrowed, by the state "goal posts" which suggest that the IMAPP effort should simultaneously focus on near term goals (such as "accomplishing" MA's recent H.4568 procurement of hydropower and off-shore wind, and "minimiz[ing] short-term financial effects to current existing resources"), as well as on largely unspecified, or vague, mid-term (10-years) and long-term (30-year) goals.[3]

<u>Proposal Justification</u>: At least three Aug. 11 presenters have indicated in their initial comments and proposals that the specific goal(s) of the IMAPP effort are to date, insufficiently defined to allow meaningful assessment.[4] CLF believes that such lack of definition will prohibit fair analysis of the already disparate substantive proposals which run the gamut from protecting current generator revenues (both because of,[5] and alternately without regard for,[6] carbon emissions) to the creation of new forward markets to procure "clean energy" in amounts to be designated by "the states" which currently have no direct mechanism for regular participation in ISO-NE markets.[7] Similarly, having some understanding of the anticipated legal basis for a Section 205 filing seeking to implement any final IMAPP recommendations will directly aid the assessment of the various IMAPP proposals including assessment against the state "goal post" that proposals include consideration of mechanisms to "ensure consumers in any one state do not fund the public policy requirements mandated by another state's laws."

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[2] NEPOOL, *Chairman's Opening Remarks NEPOOL IMAPP Initiative* (Aug. 11, 2016), at 2; *see also id*. at 3 ("But state policy objectives are changing to encourage the decarbonization of the generating fleet, and so too must our markets.").

[3] NEPOOL, *Policy and Markets: Goal Posts* (Jun. 16, 2016), at 1-2.

[4] *See, e.g.*, Publicly Owned Entity Sector Presentation (Aug. 11, 2016), at 6 ("The starting point for process improvement needs to be defining the set of objectives we are looking to achieve (i.e. agree on "What constitutes success…") • Objectives and goals define structures and design approaches • Structures and design approaches drive outcomes"); NextEra, *Meeting the Region's Carbon Goals: IMAPP Presentation* (Aug. 11, 2016), at 2 ("Clear definition of state public policy goals is key"); *accord* CLF, *Integrating Markets and Public Policy: Using Competitive Markets to Achieve New England's Energy Decarbonization Goals* (Aug. 11, 2016), at 5 ("Preliminary Step(s) • Develop understanding of what we want the markets to deliver").

[5] *See* William Short, *Proposal for clean power plant solicitation* (Aug. 11, 2016), at 2.

[6] *See* NRG, *Capacity markets & efficient renewable procurement in a carbon-constrained world* (Aug. 11, 2016), at 9.

[7] *See* National Grid, *A Forward Clean Energy Market for New England?* (Aug. 11, 2016), at 6-8; NextEra, *Meeting the Region's Carbon Goals: IMAPP Presentation* (Aug. 11, 2016), at 4-5.

In support of Additional Proposal 1, CLF intends to present a draft formulation of a clear and concise statement of specific objectives for the IMAPP effort.

Sincerely,

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