



NEW ENGLAND POWER POOL

PROPOSED AGENDA

Integrating Markets and Public Policy (IMAPP)

Plenary Meeting #6

Thursday, November 10, 2016

DoubleTree Hotel, Westborough, MA

Morning Session

9:30 a.m. - 12:00 p.m.

- **Introductory Remarks**
- **Draft Results of 2016 Economic Studies (NEPOOL Scenario Analysis)**
- **Refinement and Discussion on Conceptual Proposals**
 - Carbon Integrated Forward Capacity Market (FCM-C)
 - Forward Clean Energy Market (FCEM)

Lunch Break

12:00 – 12:30 p.m.

Afternoon Session

12:30 – end of day (estimated to be 4:00 p.m.)

- **Refinement and Discussion on Conceptual Proposals (cont.)**
 - Carbon Pricing in the Energy Market
 - Update on Clean Power Plant Solicitation Proposal (High Liner Foods)
 - Update on FCM Two-Tiered Pricing Construct (NRG)
 - **Overview: Interaction between Current State-Mandated Solicitation Timelines & FCA Schedules**
 - **Revised IMAPP Schedule/Concluding Remarks**
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CLF Proposal Potential Adjustments

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November 11, 2016

Key Issues to Address in the CLF Proposal

- In our discussions, it has become clear that two key issues raised by NESCOE need to be somehow addressed in CLF's proposal:
 1. **Existing Clean Resources:** How to provide the most efficient going-forward incentives, while mitigating customer costs associated with payments to existing clean resources?
 2. **Cross Subsidies Among States:** How to address NESCOE objective that no state should be required to pay for the environmental policies of other states?

Issue 1: Existing Clean Resources

Economic Efficiency: All existing and new clean resources should be treated exactly the same to minimize societal cost

- **Economic Efficiency: Level Playing Field**

- Key advantage of markets is that they enable competition and innovation to drive down costs
- The widest possible competition (existing vs. new, different technologies, different business models, internal vs. imported) will allow the least-cost options to survive and drive out higher-cost options
- Lowest societal cost is achieved through a level playing field

- **Inefficiencies from Excluding Existing Clean Resources**

- Excluding existing clean resources would increase societal costs. Lower-cost existing resources needing modest reinvestments may retire even while high-cost new clean resources are being developed
- Problem exacerbated if PPA-driven (or FCM-C driven) new clean resources are added and drive down energy/capacity prices. Poorer financial performance for existing resources will make them even more likely to retire
- Clean energy investments are then self-defeating. Customers spend money on new clean resources only to induce retirements of existing clean resources (potential to spend money without net gains in CO₂ reductions)

Customer Costs: NESCOE's transitional concern regarding customer cost effects

- **Short-Term Concern for Customers:**

- A subset of existing clean resources have low net going-forward costs and might stay online for several years even if they earn no additional payments
- These low-cost existing clean resources would earn higher payments from ZECs or CO₂ price over this interim period, without making incremental contributions to the CO₂ objective compared to the status quo
- This transfer payment does not affect economic efficiency, but does increase customer costs. Customers wish to mitigate payments to existing clean resources that would have stayed online regardless

- **Longer-Term Customer Interest:**

- Over time, the net going-forward reinvestment/refurbishment costs of existing clean resources will rise until they are similar to those of new resources
- Once that happens, existing clean resources will retire unless they are paid the same as new resources
- Customers will see lowest cost if all existing and new resources are treated the same, so that the lowest cost resources can continue operating or be developed

Issue 1: Existing Clean Resources

Considerations for Existing Clean Resources

- No easy solution for treatment of existing clean resources
- Directionally, customer and societal interests would both be best served if it were possible to develop options that could do two things:
 - Give the right going-forward incentives to existing clean resources (and eventually put them on an entirely level playing field with new clean resources before any reinvestment or retirement decisions need to be made)
 - Mitigate the potential for large transfer payments from customers to existing clean resources over an interim transition period
- But these two objectives are in conflict. We want to be clear that any level of resource discrimination will introduce economic inefficiency and associated concerns:
 - No good way to determine when any particular existing clean resource's net going-forward costs are "high enough"
 - Permanently baking in any resource discrimination against some clean energy resource types will have adverse consequences that may grow over time
 - For example, excluded resources will retire early even if they are very low cost compared to included resources (increasing societal and customer costs in the long run, while undermining the CO₂ reduction objectives driving new clean energy procurements)
 - States might be able to step in and save those existing clean resources on an out-of-market basis, but one-off negotiations risk an uncompetitive price, paying a high price to recontract when lower-cost in-market options might have been available, and there is a risk that states may not have the institutional mechanisms in place to act quickly

Issue 1: Existing Clean Resources

Potential Options for Addressing NECSCOE Concerns

- We view the first-best option from a societal perspective as one that treats all clean energy resources on an entirely level playing field
- Second-best alternatives can be developed that sacrifice some economic efficiency, but prevent most of the potential for substantial transfer payments over a transition period. For example:
 - PPAs between States/Utilities and Existing Clean Resources: Existing clean resources that are under a PPA before FCM-C is implemented are unlikely to pose a concern. PPA agreements are typically structured to return market revenues to the contractual counterparty (just like capacity and energy revenues are returned, ZEC revenue would also be returned)
 - Phase-in of Existing Clean Resources: Another option is to phase existing clean resources into FCM-C as a function of age (their full quantity of ZECs would be accounted for in auction clearing, but the resources would be paid for only a portion of their ZECs, increasing to 100% as the resources age). Some efficiency would be sacrificed, but transfer payments prevented
 - Hedge-Like or PPA-Like Tariff Structure: For existing clean energy resources in a transition period, FCM-C payments would be at a fixed, negotiated rate. Over time those resources would be transitioned into being treated on a level basis with new resources. Again, some efficiency may be sacrificed, but transfer payments would be prevented
- Many variations, each with pros and cons. We hope to initiate discussion about what options may be promising to pursue further

Issue 2: Cross Subsidies Among States

- NESCOE “Objective 1” states that cross subsidies need to be prevented
- Two perspectives on cross subsidy issues:

Perspective of Non-Participating States with Modest Decarbonization Targets

- Do not wish to pay for the decarbonization policies of other states
- CO₂ price alone might result in higher customer costs in non-participating states (but impact would be mitigated by CO₂ charges that are returned to customers, and offsetting changes in capacity market)

Perspective of Participating States with the Most Ambitious Decarbonization Goals

- Concern about subsidizing the energy use of non-participating states
- PPA-driven or ZEC-driven clean energy will reduce energy and potentially capacity prices, benefitting customers across New England (regardless of whether they are allocated any costs of the procurements)
- Lower energy and capacity prices have the effect of increasing the “green attribute” payment for clean resources through PPAs, RECs, or ZECs
- Potential retirement of existing clean resources would magnify the cross subsidy effect, if this leads to even more PPA or ZEC procurements for new clean energy or PPA interventions to save existing clean resources

Issue 2: Cross Subsidies Among States

Potential CLF Proposal Adjustments

- Two-part proposal with both CO₂ pricing and ZEC procurement creates an opportunity to mitigate cross subsidies (can be entirely prevented if there is perfect foresight)
- Proposal mechanics to be worked out if the overall concept is agreeable

Step 1: FCM-C

1. ZECs procured through FCM-C are allocated to loads in the participating states
2. Causes energy and capacity price suppression that benefits all customers (creates a cross subsidy from participating to non-participating states)*

Step 2: CO₂ Pricing

1. Moderate CO₂ price is imposed, high enough to restore customer costs for non-participating states back to a status quo level without FCM-C (after accounting for rebates from CO₂ charges)
2. Non-participating states' customer costs not affected on a net basis. Note that substantial estimation errors may require relying on informed judgement within a reasonably supported range
3. Size of the CO₂ price may be lower than the societal cost that CLF has previously proposed

Importance of Incorporating a CO₂ Price

- NESCOE has previously expressed a preliminary view that CO₂ pricing options (especially if pursued alone without FCM-C) could be undesirable due to the potential for remunerating existing clean resources at a higher level than in the status quo, and requiring non-participating states to pay for the policy objectives of other states
- These potential adjustments to CLF's proposal are intended to address both concerns
- We want to take this opportunity to reiterate the importance of incorporating a CO₂ price from an economic efficiency perspective

Advantages of CO₂ Pricing

- Directly corrects the market failure by internalizing the externality. Most efficient (lowest societal cost) way to achieve CO₂ reductions
- Immediate CO₂ reduction impact based on fuel switching away from remaining coal plants, utilizing DR for peaking needs, reducing CO₂ emissions associated with start-up/shut-down
- Customer cost impacts are limited due to: reductions to ZEC and capacity prices, rebate from ZEC payments, and inducing greater energy efficiency
- Creates differentiation among clean energy resources, providing the strongest incentives for the resources that avoid the most CO₂ reductions. Importance of this attribute will grow enormously as the system becomes more decarbonized, e.g. if in the future gas is only on the margin ½ of the hours, some clean resources may not displace much fossil generation
- Mitigates potential for adverse interactions between ZEC product and energy market price formation (magnitude of negative pricing and associated problems are mitigated, plus the CO₂ implications of min generation events are incorporated into commitment/dispatch decisions)



Discussion

Update on Carbon Price Proposal

November 10, 2016

DRAFT



NESCOE identified three major concerns with the carbon price proposal

- **Concern #1: the carbon price raises customer costs and presents cost allocation challenges**
 - In response to these concerns, Exelon has revised its proposal to set the initial carbon price at \$32/ton, rather than at the Social Cost of Carbon (\$42/ton). This level is based on the Social Cost of Carbon less the \$10/ton RGGI soft price cap
 - At this price level, offsetting benefits lead to net customer savings relative to the status quo
 - Customers in states that lack legislative carbon goals are better off with a carbon price when the price impact of renewable procurement by other states is considered
- **Concern #2: the carbon price does not guarantee new entry by clean generation**
 - On its own, a carbon price at this level is not high enough to incent entry by new renewables. For this reason, Exelon proposes that the carbon price be combined with a procurement backstop mechanism to ensure state procurement goals are met.
 - With appropriate contracting, a carbon price will directly lower the cost of such procurements
 - A \$32/ton carbon price is likely sufficient to retain nuclear and non-RPS qualifying hydro alleviating any future need to provide state support for these resources
 - By moving some resources in-market and reducing state-support costs for others, a carbon price reduces concerns related to Minimum Offer Price Rule mitigation (or similar)
- **Concern #3: doubts exist as to whether ISO-NE has legal authority to implement a carbon price**
 - FERC has adequate authority to allow market rules to reflect carbon intensity
 - This concern is no more significant for the carbon price proposal than it is for any of the other proposals.

Benefits from carbon emission revenue, renewable subsidy cost decrease, and nuclear retention outweigh the price impact of carbon at \$32/ton

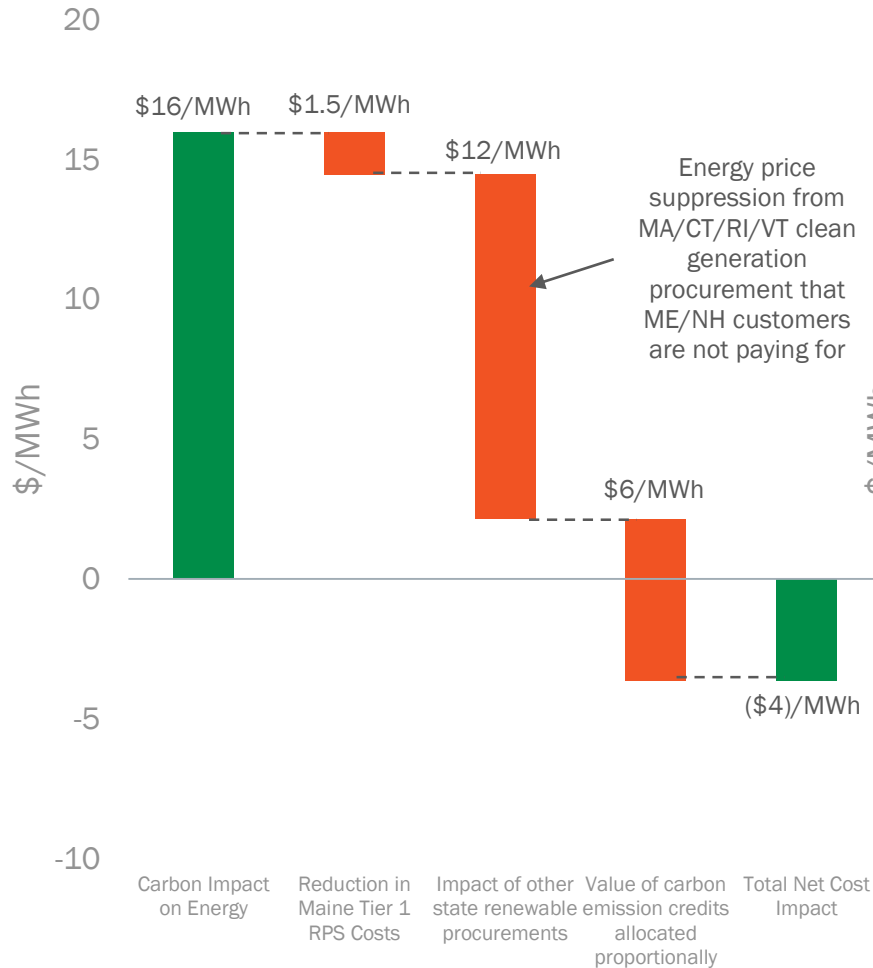
2030 retail rate impacts of administered carbon price set at \$32/ton versus status quo (New England average)



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; Future state renewable price impacts estimated based on ISO-NE 2016 Economic Study draft results (comparison of constrained scenarios 3 and 5 assuming 20.7 TWh of new renewables).

Customers in states without carbon goals are also better off with a carbon price, which reduces the need for a differential credit allocation scheme

Impact of \$32/ton Carbon on Maine Customers in 2030



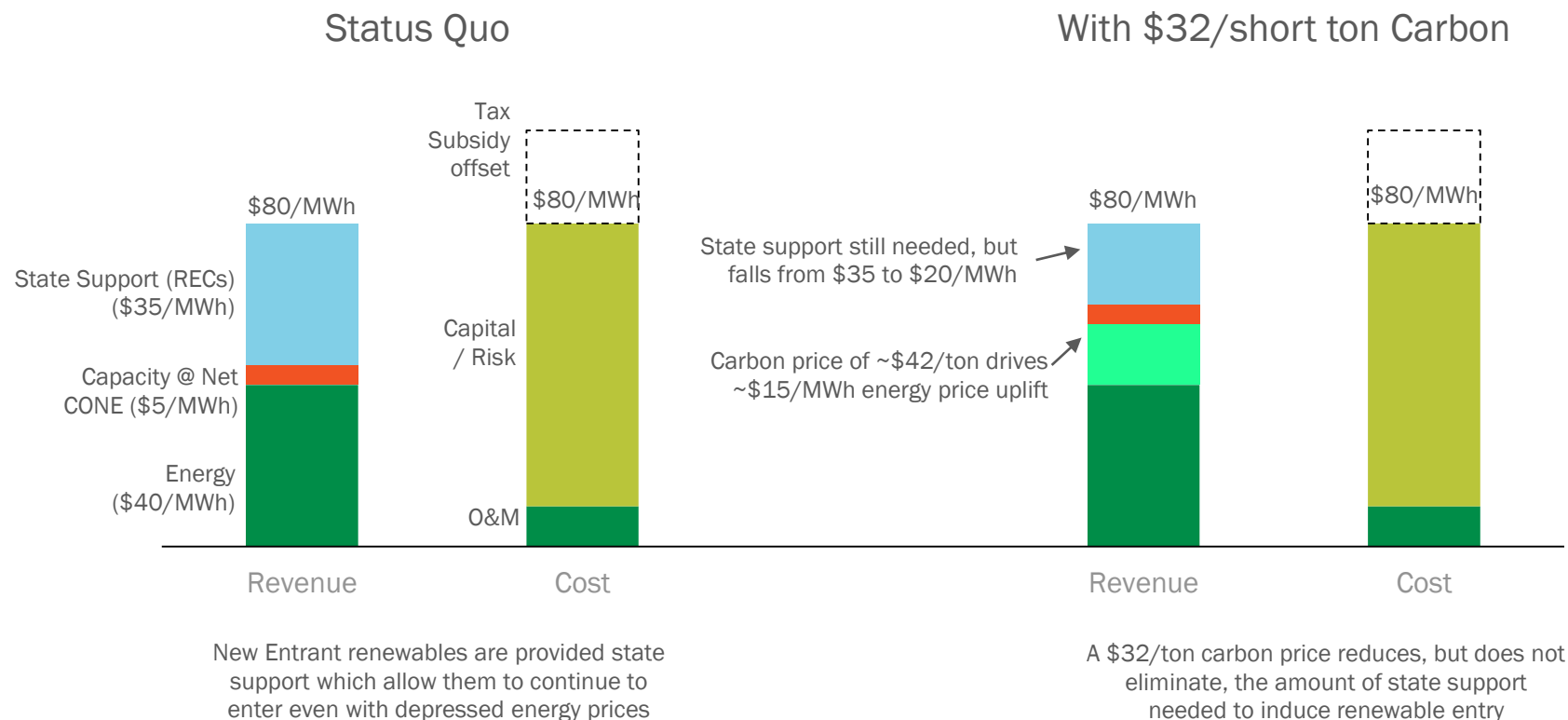
Impact of \$32/ton Carbon on New Hampshire Customers in 2030



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; Future state renewable price impacts estimated based on ISO-NE 2016 Economic Study draft results omitting price impact from future ME/NH RPS increases.

\$32 carbon will reduce renewable subsidy costs but not drive new entry alone; combination with a backstop achieves this

Illustrative New Renewable Economics



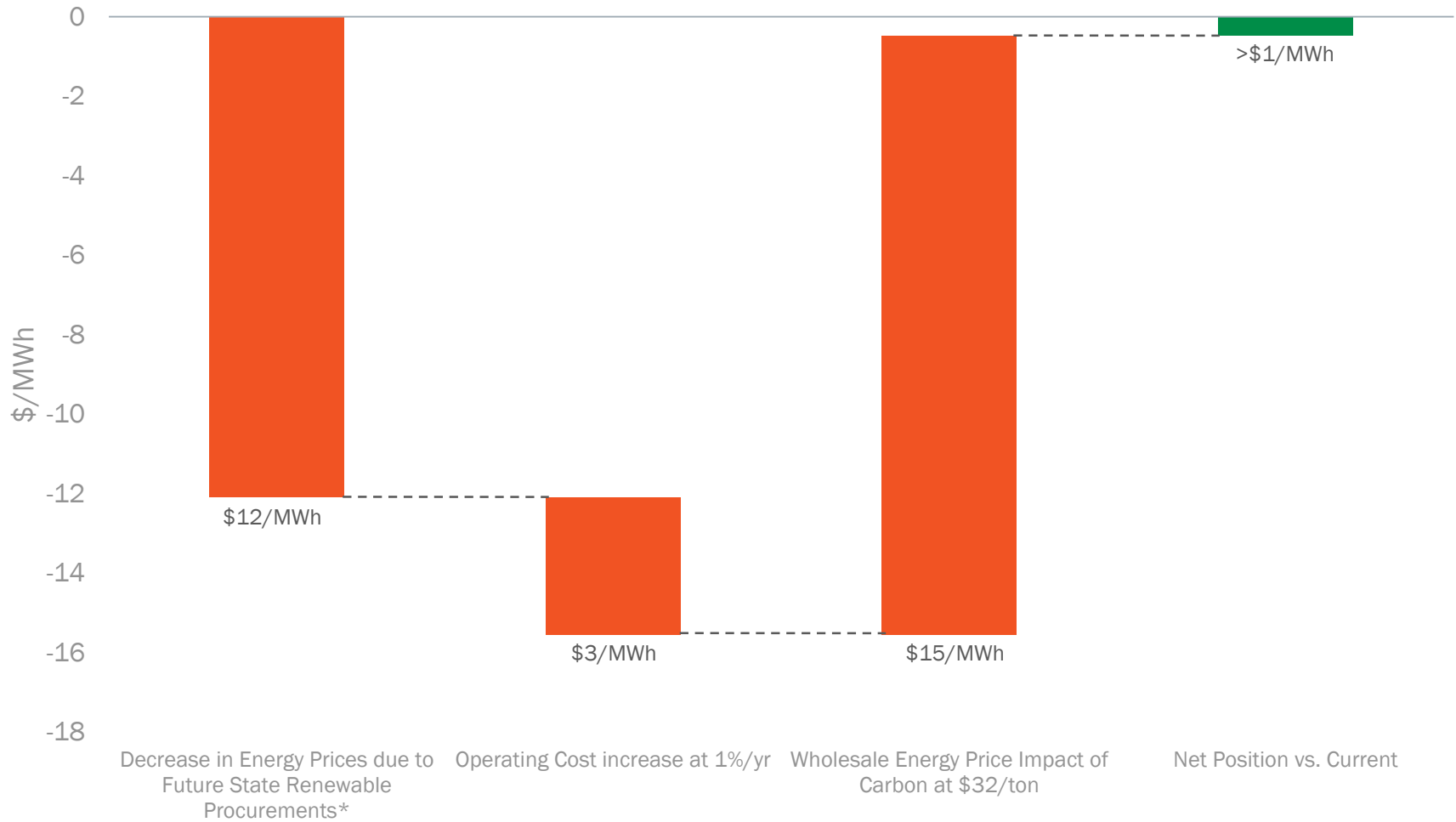
To address concerns regarding to new entry by clean generation, Exelon proposes that the carbon price proposal be combined with a clean generation procurement backstop mechanism. The FCM-C or FCEM proposals are examples of such a mechanism, as is the current range of state RPS & clean generation contracting programs. Any of these mechanisms could be combined with the carbon price proposal to achieve the desired result.

Carbon pricing enhances efficiency of all backstop mechanisms

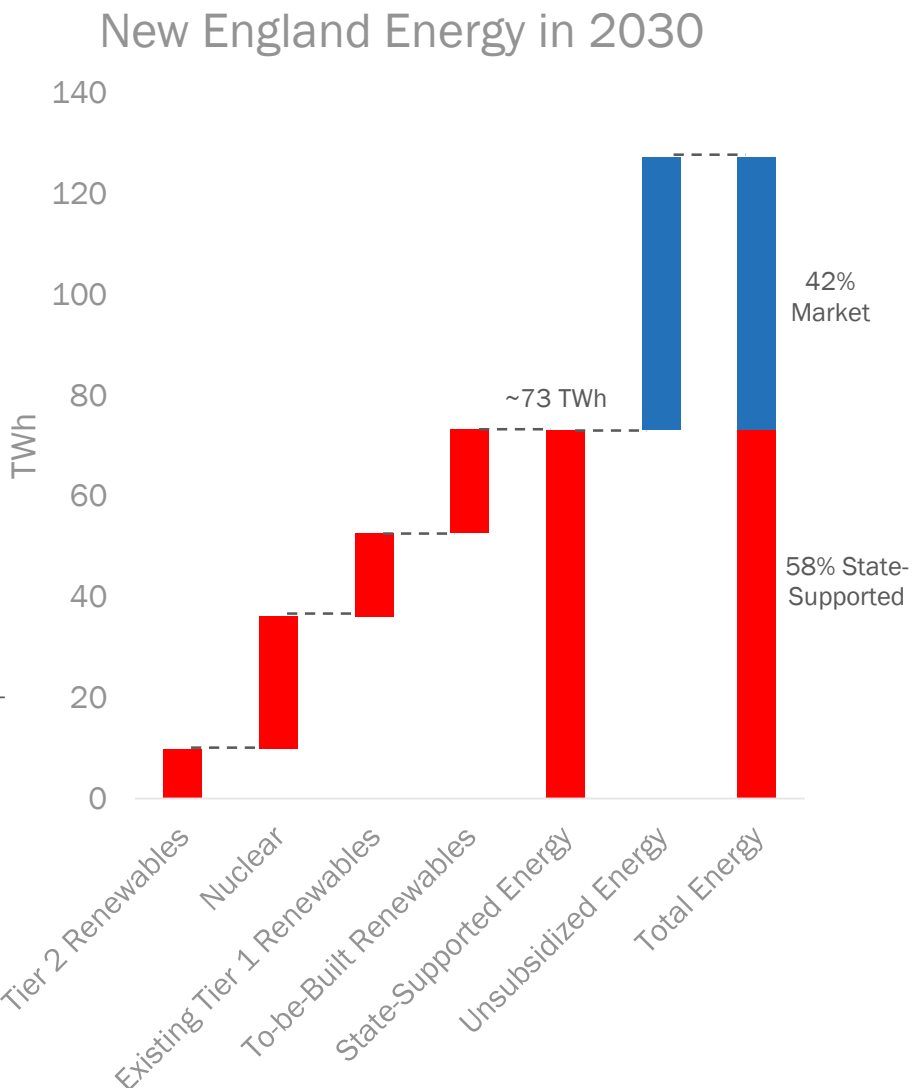
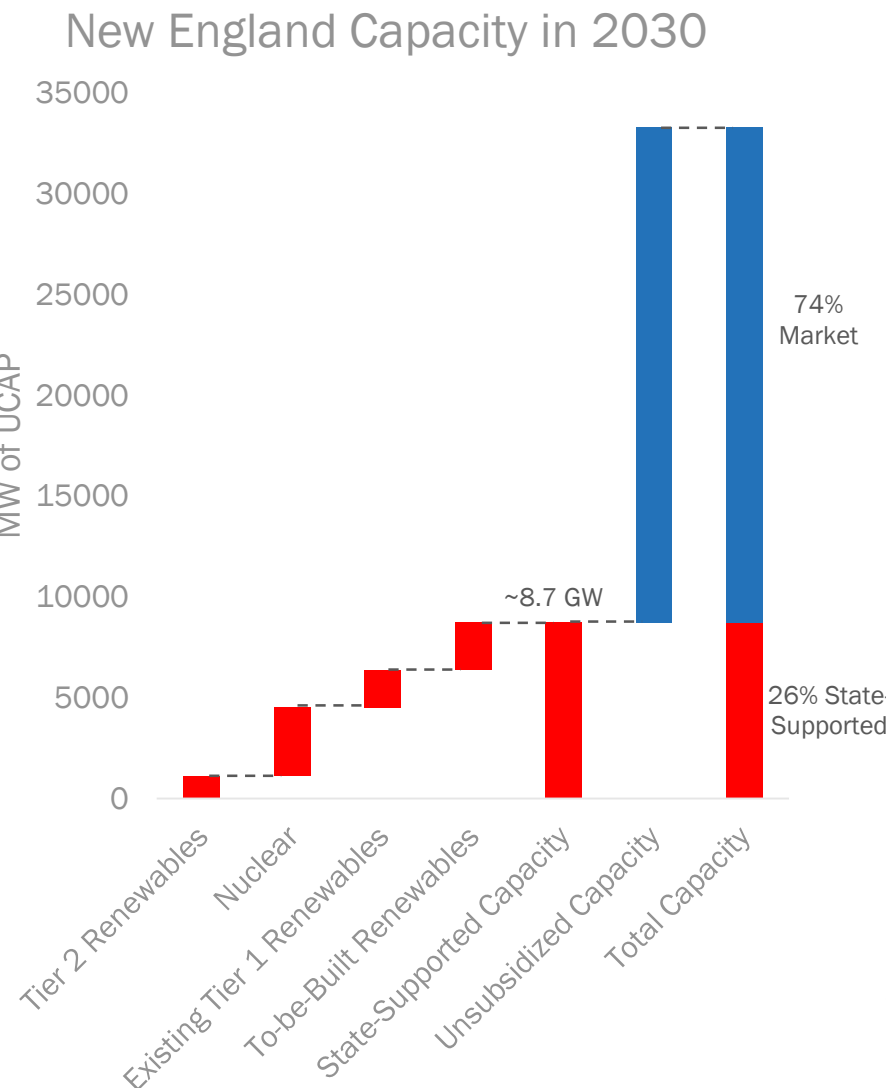
- Carbon pricing at an adequate level can provide a complete and efficient solution to achieving carbon reductions without the need to rely on backstop mechanisms
- However, carbon pricing and other mechanisms such as RPS, contracts or an FCEM are not mutually exclusive
 - To prevent sudden consumer impacts, it may not be feasible to immediately incorporate the level of carbon pricing necessary to cover the cost of investment in new zero-carbon generation. A \$32/ton price should be sufficient to keep largest existing zero carbon resources in-market
- From a consumer perspective, carbon pricing is not an additive expense but should allow REC prices, contract rates or FCEM prices to be proportionally lower
 - Future contracts can include a mechanism to offset contract rates with carbon price benefits dollar for dollar
- Because the benefits of carbon pricing can be attained with or without these other mechanisms it should be thought of as a foundation upon which these other mechanisms can be layered to the extent they demonstrate merit.

A \$32/ton carbon price is sufficient to offset future price suppression and cost inflation for nuclear

Incremental New England Nuclear Economics over 2020-2030 with State-Driven Renewable Buildout and \$32/ton Carbon

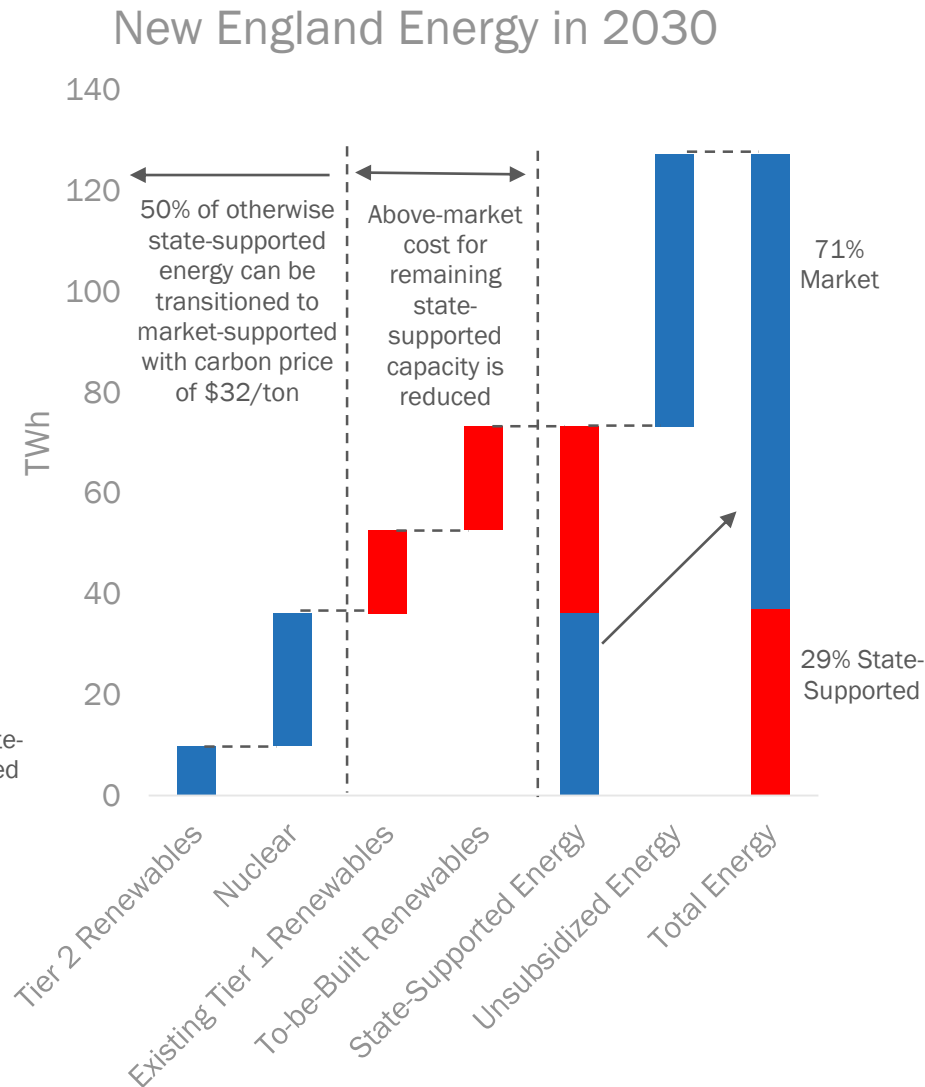
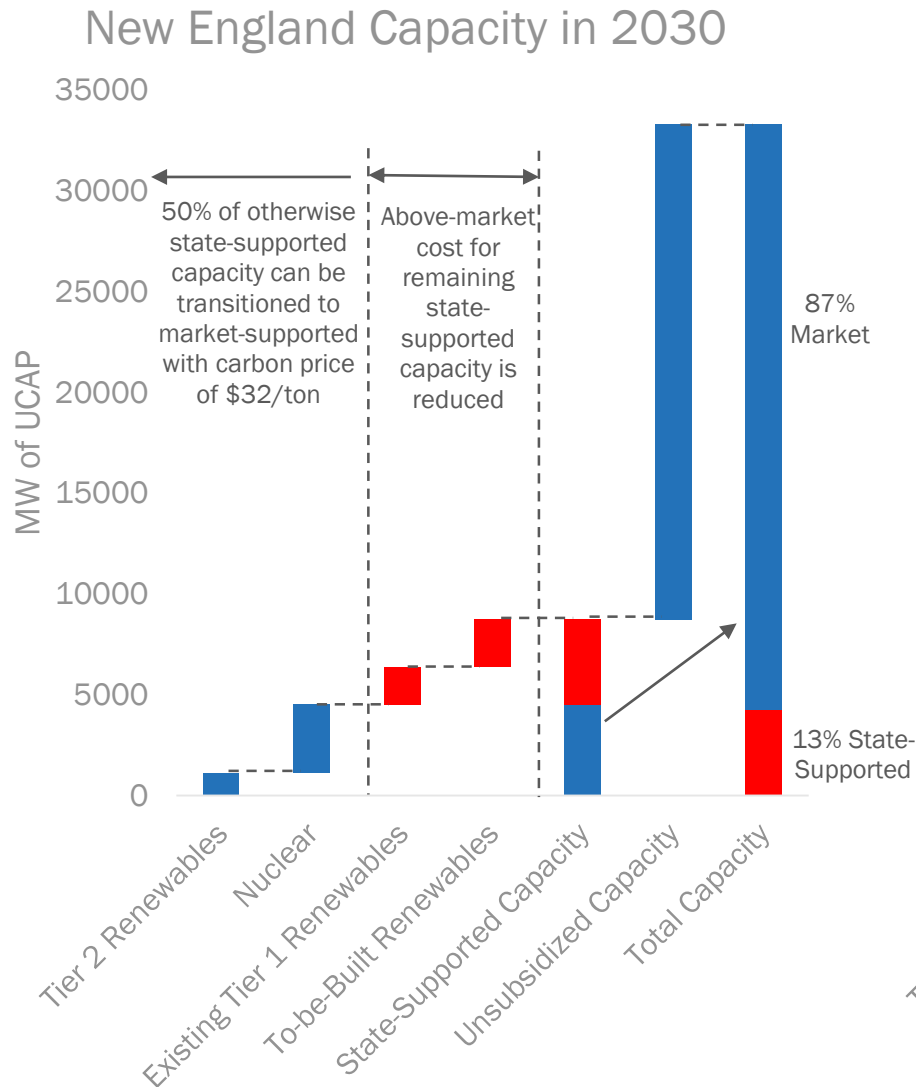


Under the current status quo, approximately 25% of capacity and 60% of energy will require state support by 2030



Note: To-be-built renewables includes 9.45 TWh of incremental clean generation specified in MA H. 4568

A \$32/ton carbon price would transition about half of state-supported energy and capacity to market



Note: To-be-built renewables includes 9.45 TWh of incremental clean generation specified in MA H. 4568

Legal concerns are not unique to carbon price proposal, and in any event are surmountable

- The term "just and reasonable" is ambiguous and courts have recognized FERC has wide discretion to determine what is just and reasonable
- There is statutory and case law support for the concept that FERC can consider environmental issues in setting rates
- The same fundamental legal issue is raised by both the carbon price proposal and the various versions of the FCM-C/FCEM proposals. Both require FERC to accept as just and reasonable rates that reflect environmental goals.

Recommended Next Steps

- Continue work on refining proposals that have not reached the needed level of development
- Once all proposals have been developed, request that the ISO conduct an economic evaluation of the costs and benefits of each proposal, including carbon pricing
- Goal: identify the proposal that best balances the functioning of wholesale markets and cost to consumers while providing the states with the flexibility to meet their needs.

Timeline: FCM and CT 2-20 MW Clean Energy Solicitation

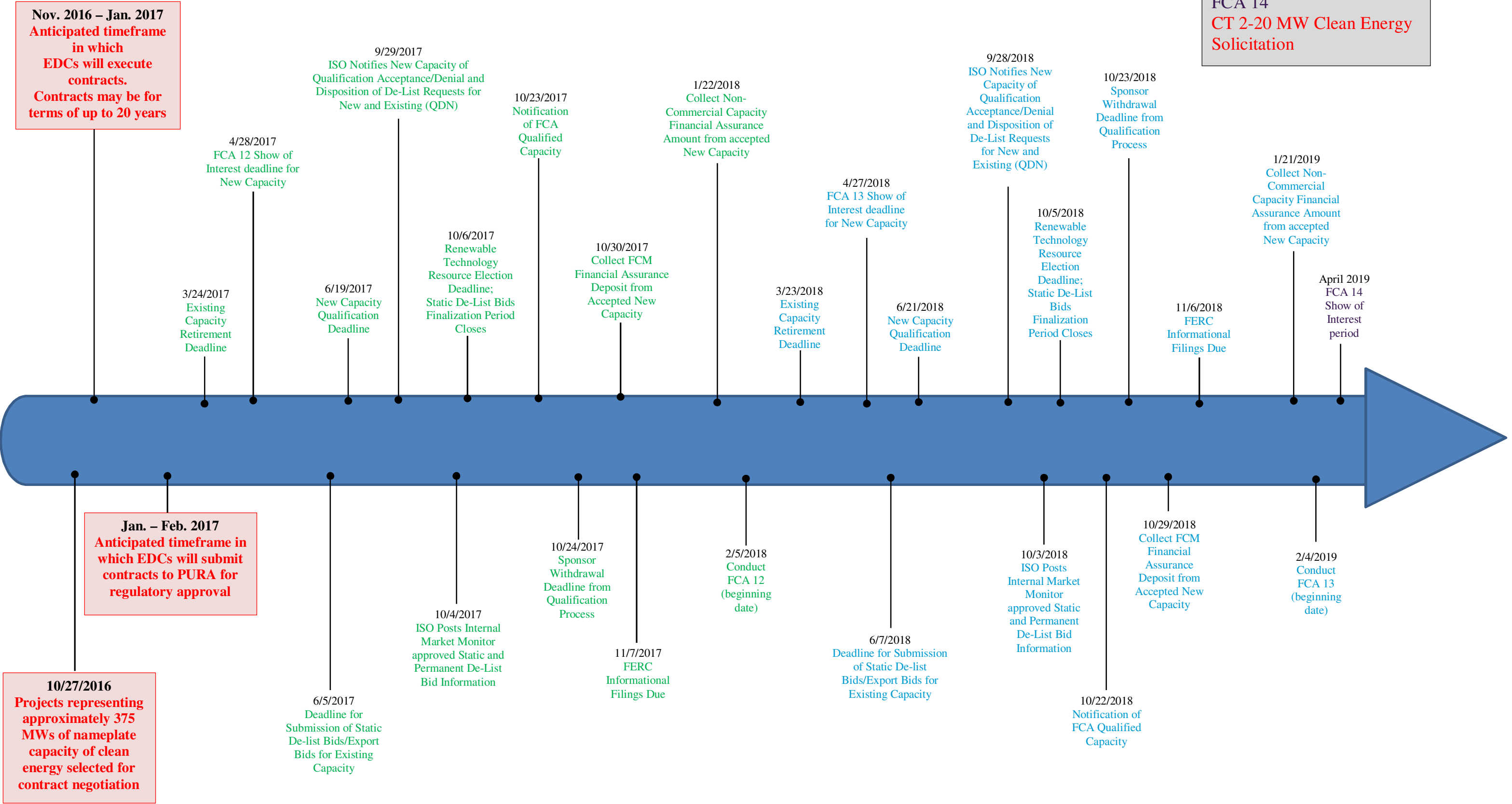
Key:

FCA 12

FCA 13

FCA 14

CT 2-20 MW Clean Energy Solicitation



Timeline: FCM and MA Clean Energy Solicitation

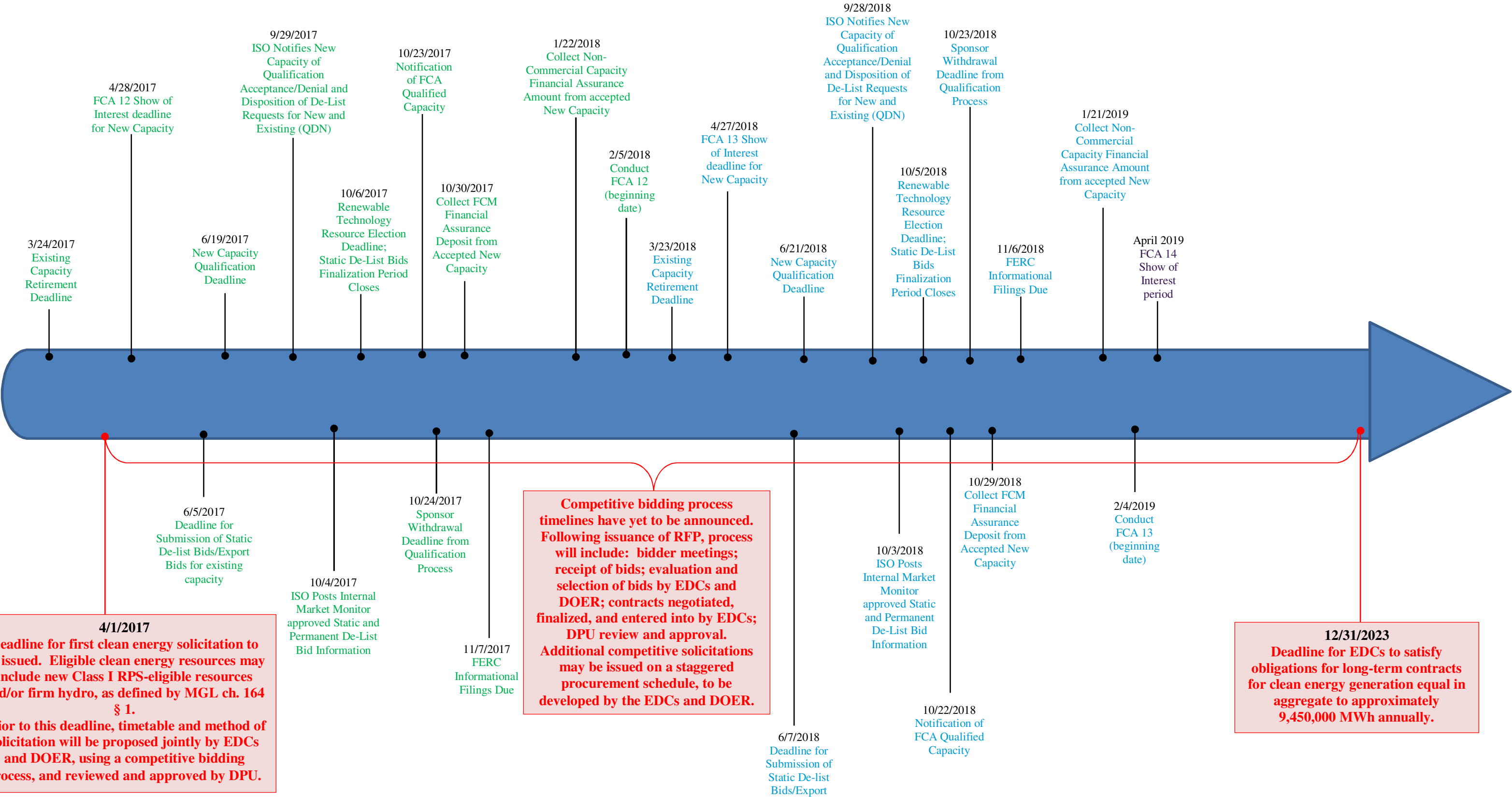
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FCA 12

FCA 13

FCA 14

MA Clean Energy Solicitation



Timeline: FCM and MA Offshore Wind Solicitation

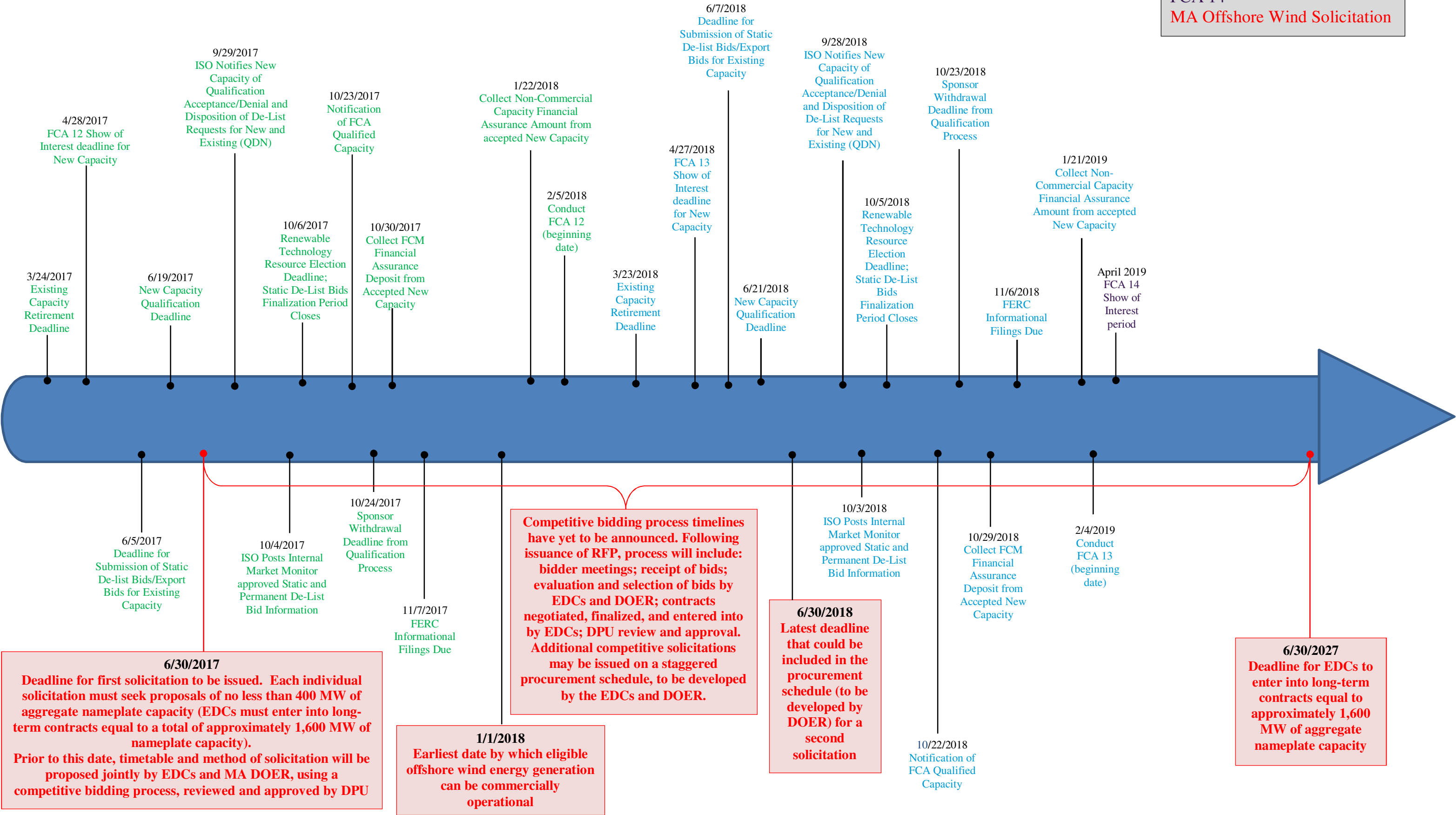
Key:

FCA 12

FCA 13

FCA 14

MA Offshore Wind Solicitation



Timeline: FCM and Multi-State Clean Energy Solicitation

Key:

FCA 12

FCA 13

FCA 14

Multi-State Solicitation

