New England Forward Clean Energy Market

PROPOSED MARKET RULES, VERSION 1

PROPOSED BY

Massachusetts Department of Energy Resources

DEVELOPED WITH SUPPORT FROM

The Brattle Group

Sustainable Energy Advantage

PRESENTED AT DOER PUBLIC WEBINAR
FEBRUARY 3, 2023

Brattle

Sustainable Energy Advantage

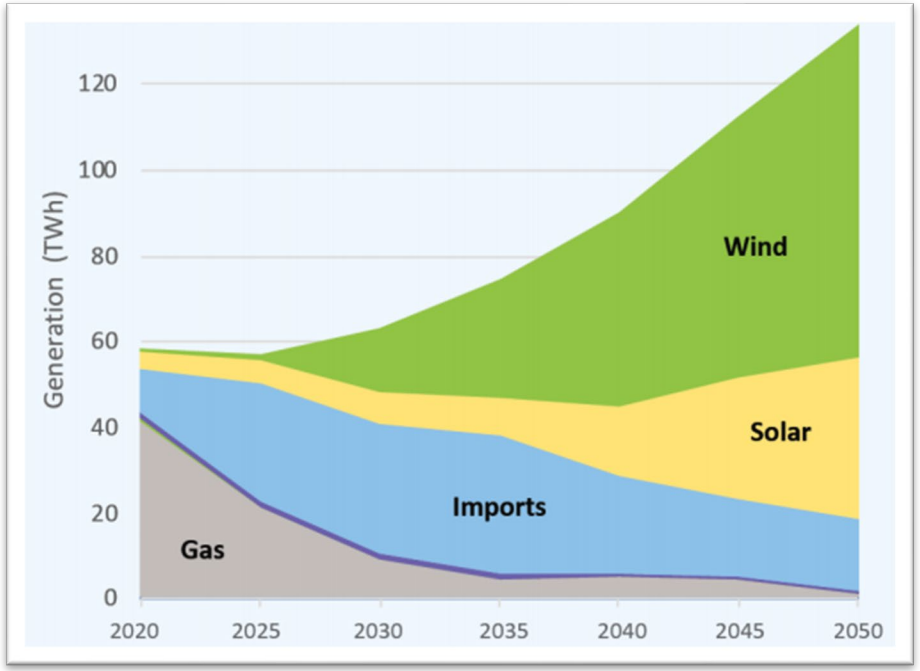
DOER
Massachusetts Department of Energy Resources

Clean Energy Market Design Reform

- In October 2020, the New England States released a **Vision Statement** for a clean, affordable, and reliable 21st century regional electric grid that identified three core segments of our shared energy system that will require significant changes
  - New England's existing wholesale electricity markets must modernize if they are to support achievement of clean energy laws, while maintaining system reliability and fostering more affordable electricity for regional consumers
  - In July 2019, NESCOE requested that ISO-NE and the New England Power Pool initiate a process to analyze and discuss potential future market frameworks that contemplate and are compatible with the implementation of state energy and environmental laws
  - In early 2021, the ISO's Board of Directors directed the ISO management team to pursue an assessment of policy and market frameworks that could further advance the evolution of the regional power grid
  - Released in April 2022, the *Pathways Study* provides the region with significant data and analysis to evaluate four approaches that could meet the New England states' ambitious environmental goals
- The Massachusetts 2022 Climate Bill directs Energy and Environmental Affairs, in consultation with the DOER and the Department of Public Utilities, to investigate the advantages and disadvantages of using or participating in regional or multi-state competitive market-based mechanisms, structures, systems or competitive solicitations in order to facilitate the development of clean energy generation resources
  - Including but not limited to offshore wind energy generation,
  - To meet the Commonwealth's clean energy needs and
  - Comply with the statewide greenhouse gas emission limits and sublimits established pursuant to the GWSA,
  - While providing benefits for the commonwealth

Current Clean Energy Markets – Status Quo

- The demand for electricity will grow as Massachusetts electrifies the transportation and heating sectors
- In order to meet emission reduction targets, the increased demand for electricity will require new clean resources to be built in New England and for clean energy generation to be incentivized
- Currently, Massachusetts utilizes portfolio standards, such as the **Renewable Energy Portfolio Standard** (RPS) and the **Clean Energy Standard** (CES), to require that the retail energy suppliers annually increase the use of clean energy generation when supplying Massachusetts customers
- Massachusetts also uses the Green Communities Act Clean Energy Procurements (Sections 83C and 83D) to facilitate the financing of clean energy generation facilities
  - The result of these procurements are long-term (up to 20 year) contracts between the Massachusetts distribution companies and the selected projects for energy and attributes (e.g. RECs)
  - The distribution companies may use the RECs for their own RPS compliance obligation or may sell the RECs for other suppliers to buy
  - This increase in REC supply then supports RPS compliance and emission reductions



2050 Decarbonization Roadmap: Electricity Generation by Source

Economic Development & Other State Policy Goals

The current model of long-term contracting includes pursuit of other state goals like economic development, environmental justice, and diversity, equity, and inclusion in the contracting process

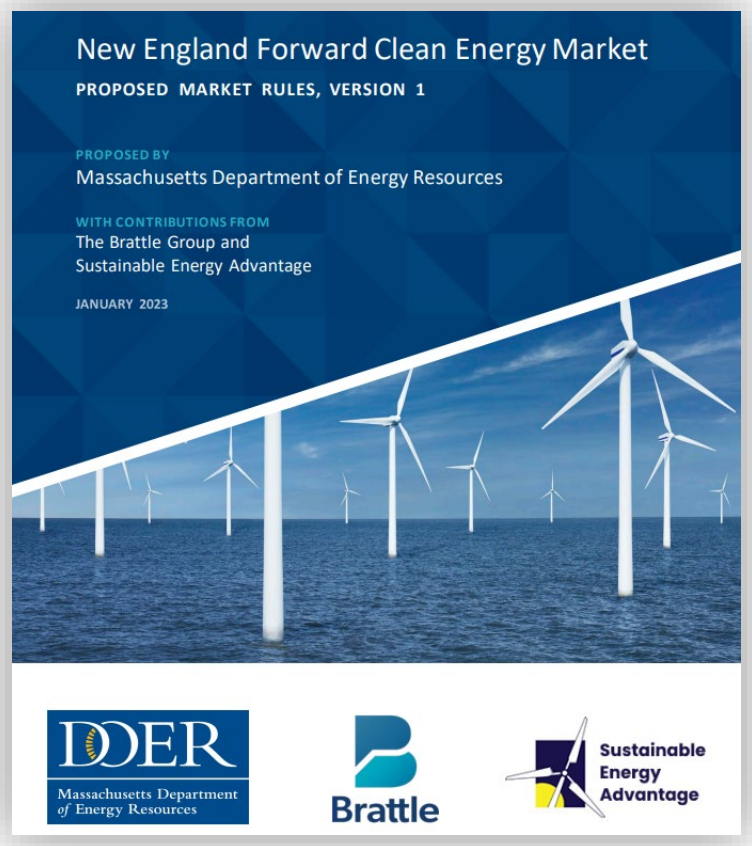
- For instance, Section 83C offshore wind RFP requires projects to demonstrate these additional benefits
- There are limitations to achieving these important Commonwealth goals in the procurement process
  - Cost of commitments is spread over 20-years contracts and funded by all ratepayers
  - PPAs do not include enforcement mechanisms for these commitments
- Neighboring states are increasingly pursuing clean energy economic development initiatives outside of procurement processes

Financing new clean energy through an energy market would separate pursuit of these state goals from t other state goals like economic development, environmental justice, and diversity, equity, and inclusion

- State would set targets for procuring clean energy in a dedicated competitive market
- State must pursue economic development, environmental justice, and DEI goals through other processes, which may include:
  - Environmental permitting and reviews
  - Economic development incentive programs
  - Workforce development grants and partnerships
  - Supplier Diversity Office certifications and support to industry
- This may improve transparency and competition on the cost of economic development initiatives, ensure greater compliance and strengthen enforcement mechanisms, improve the equitable allocation of costs, and better target initiatives

Forward Clean Energy Market (FCEM)

- DOER was interested in investigating clean energy market designs that addressed key goals:
  - (1) support the financing of new clean energy projects with financeable product,
  - (2) support the scale and supply mix of clean energy that will be required to meet the region's and Massachusetts' ambitious clean energy and emission reduction targets while maintaining system reliability
  - (3) be implementable by state and/or federal authorities, integrating effectively with existing regulations.
- To advance regional discussions toward implementation, DOER commissioned consultants at The Brattle Group and Sustainable Energy Advantage to support the development of a detailed design proposal
  - Study process builds on several years of study and design work by New England States Committee on Electricity (NESCOE), New England Power Pool (NEPOOL), Independent System Operator of New England (ISO-NE), and others
  - Engaged in detailed interviews with all New England states and discussions within New England States Committee on Electricity (NESCOE) to inform design proposal
- DOER has issued a detailed proposal for a new "Forward Clean Energy Market" (FCEM) that can attract large-scale investment in clean energy for the region
- DOER seeks stakeholder feedback on the FCEM design proposal, which will be incorporated into the DOER's upcoming report to state legislature and regional engagement



See Full Proposal: New England FCEM Design

Goals of the Proposed FCEM Design

The goal of releasing the FCEM Design Proposal is to contribute to our regional discussions with the New England partners and power sector stakeholders, prompt conversation, and help identify areas for further refinement.

- Enable state policymakers and consumers to reflect and achieve their **decarbonization goals** through a competitive regional marketplace
- Ensure that participation is **voluntary**, costs are assigned to voluntary buyer participants, and that no costs are imposed on non-participants in the FCEM
- **Align with and augment other contracting and policy instruments** that states and consumers have used, and will continue to use, to meet policy goals, while allowing states to replace existing policy and contract mechanisms with a competitive market mechanism if desired
- Achieve economically efficient and affordable clean energy transition through the use of **competitive markets**, and by aligning with complementary competitive wholesale and retail market structures across the region
- Offer **robust and commercially reasonable financial terms** sufficient to attract the large-scale investments in developing and financing new clean energy infrastructure
- Align with **system reliability** needs and the market and regulatory structures, both present and future, that will be needed to maintain reliability throughout clean energy transition
- Provide a **sound governance framework** that reflects a proper level of state oversight, empowers consumers to reflect their goals, enables innovation in policy and product design, and offers a stable and sustainable foundation for attracting large-scale financial investments

Design objectives as derived from New England States' Vision Statement Report to the Governors and from the states' engagement in the development of this FCEM design proposal.

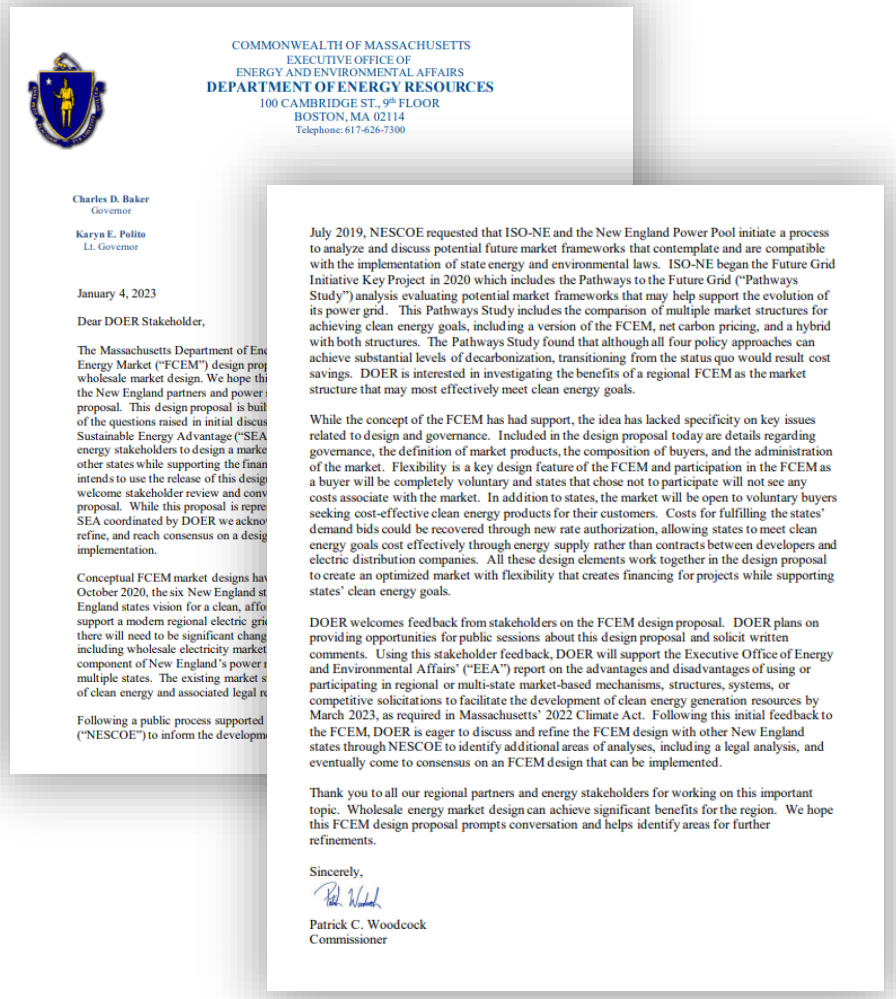
Massachusetts DOER is Seeking Stakeholder Feedback

Massachusetts Process

- Public webinar to present FCEM report (today)
  - Introduction
  - Technical Review
  - Question and Answer
- Stakeholder comments requested, due **February 17, 2023** (to joanna.k.troy@mass.gov)
- Stakeholder feedback will inform DOER's report to legislature, due by **March 1, 2023** (required by Massachusetts' 2022 Climate Act, Section 85)

Regional Engagement

- Engagement with NEPOOL, ISO-NE and regional stakeholders and processes
- Continued discussion with New England states via NESCOE to revise and refine the FCEM proposal, seeking consensus on an FCEM design that can be implemented



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., 9TH FLOOR
BOSTON, MA 02114
Telephone: 617-626-7300

Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

January 4, 2023

Dear DOER Stakeholder,

July 2019, NESCOE requested that ISO-NE and the New England Power Pool initiate a process to analyze and discuss potential future market frameworks that contemplate and are compatible with the implementation of state energy and environmental laws. ISO-NE began the Future Grid Initiative Key Project in 2020 which includes the Pathways to the Future Grid ("Pathways Study") analysis evaluating potential market frameworks that may help support the evolution of its power grid. This Pathways Study includes the comparison of multiple market structures for achieving clean energy goals, including a version of the FCEM, net carbon pricing, and a hybrid with both structures. The Pathways Study found that although all four policy approaches can achieve substantial levels of decarbonization, transitioning from the status quo would result cost savings. DOER is interested in investigating the benefits of a regional FCEM as the market structure that may most effectively meet clean energy goals.

While the concept of the FCEM has had support, the idea has lacked specificity on key issues related to design and governance. Included in the design proposal today are details regarding governance, the definition of market products, the composition of buyers, and the administration of the market. Flexibility is a key design feature of the FCEM and participation in the FCEM as a buyer will be completely voluntary and states that chose not to participate will not see any costs associate with the market. In addition to states, the market will be open to voluntary buyers seeking cost-effective clean energy products for their customers. Costs for fulfilling the states' demand bids could be recovered through new rate authorization, allowing states to meet clean energy goals cost effectively through energy supply rather than contracts between developers and electric distribution companies. All these design elements work together in the design proposal to create an optimized market with flexibility that creates financing for projects while supporting states' clean energy goals.

DOER welcomes feedback from stakeholders on the FCEM design proposal. DOER plans on providing opportunities for public sessions about this design proposal and solicit written comments. Using this stakeholder feedback, DOER will support the Executive Office of Energy and Environmental Affairs' ("EEA") report on the advantages and disadvantages of using or participating in regional or multi-state market-based mechanisms, structures, systems, or competitive solicitations to facilitate the development of clean energy generation resources by March 2023, as required in Massachusetts' 2022 Climate Act. Following this initial feedback to the FCEM, DOER is eager to discuss and refine the FCEM design with other New England states through NESCOE to identify additional areas of analyses, including a legal analysis, and eventually come to consensus on an FCEM design that can be implemented.

Thank you to all our regional partners and energy stakeholders for working on this important topic. Wholesale energy market design can achieve significant benefits for the region. We hope this FCEM design proposal prompts conversation and helps identify areas for further refinements.

Sincerely,

Patrick C. Woodcock
Commissioner

See: Letter from Commissioner Woodcock

Technical Review

What is the forward clean energy market?

A new component of the New England wholesale electricity marketplace through which Massachusetts and other states can coordinate procurements of large amounts of clean energy at a competitive price

Buyers Submit bids to purchase

Sellers Submit offers to sell

FCEM New England (FCEM-NE)

- New independent non-profit entity FCEM-NE is created and overseen under joint authority of 6 New England states and federal government
- Conducts a coordinated regional procurement for clean energy certificates (similar to ISO-NE bulk electricity markets)
- 3-year forward auction, conducted every year
- Auction clearing format selects winning buyers and sellers, sets clearing price, and seeks to maximize the volume of trade
- New resources can gain 15-year (reducing to 7-year over time) fixed-price commitments

Buyers Winning buyers receive certificates, make payments

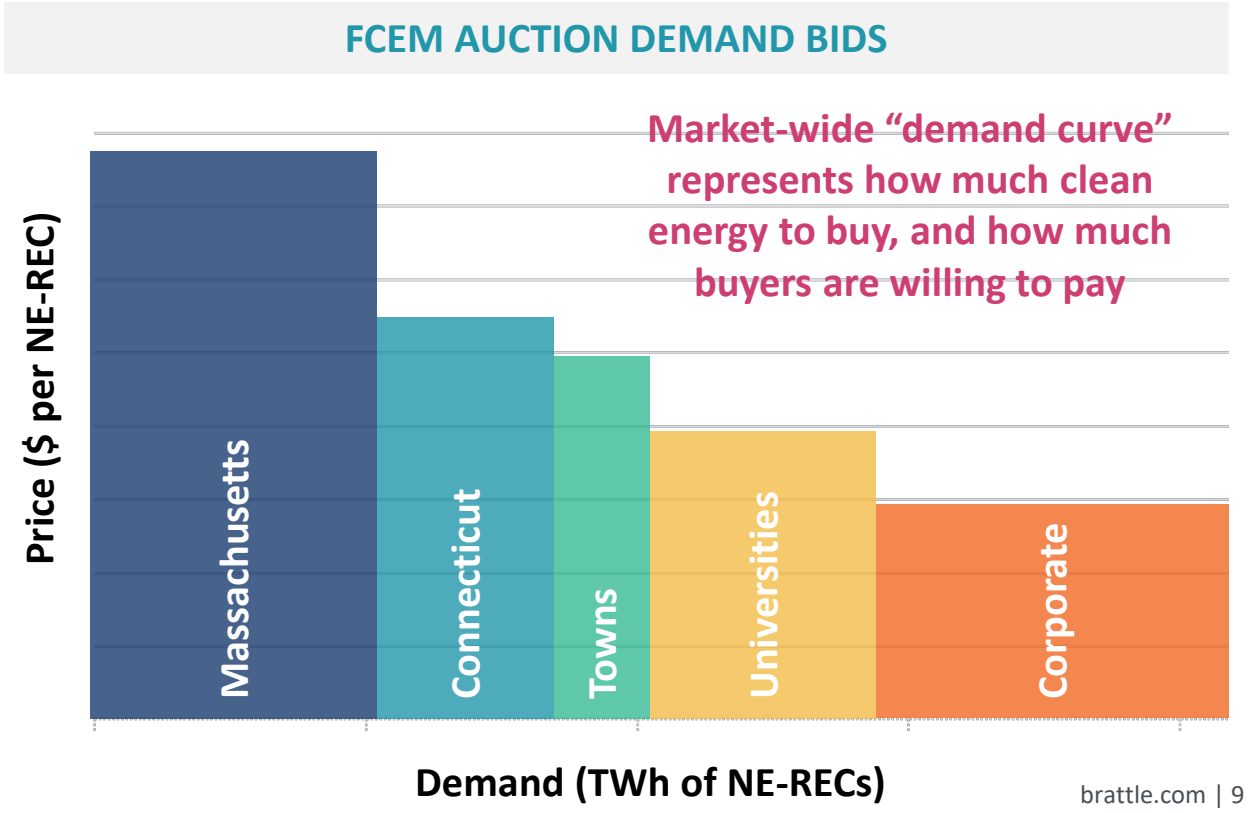
Sellers Winning sellers deliver certificates, earn payments

Who can buy in the FCEM?

FCEM can accept all types of buyers from state agencies, suppliers, utilities, and smaller buyers such as localities, universities, and corporate buyers

How it works:

- Buyers place “demand bids” that represent desired amount of clean energy and maximum price they are willing to pay
- Buyers can specify one or more categories of renewable energy certificates (RECs) or other certificates they wish to buy
- Buyers can specify “new-only” demand bids
- FCEM auction will seek to fill as many buy orders as possible, clearing price is always equal or below the buyer’s specified price

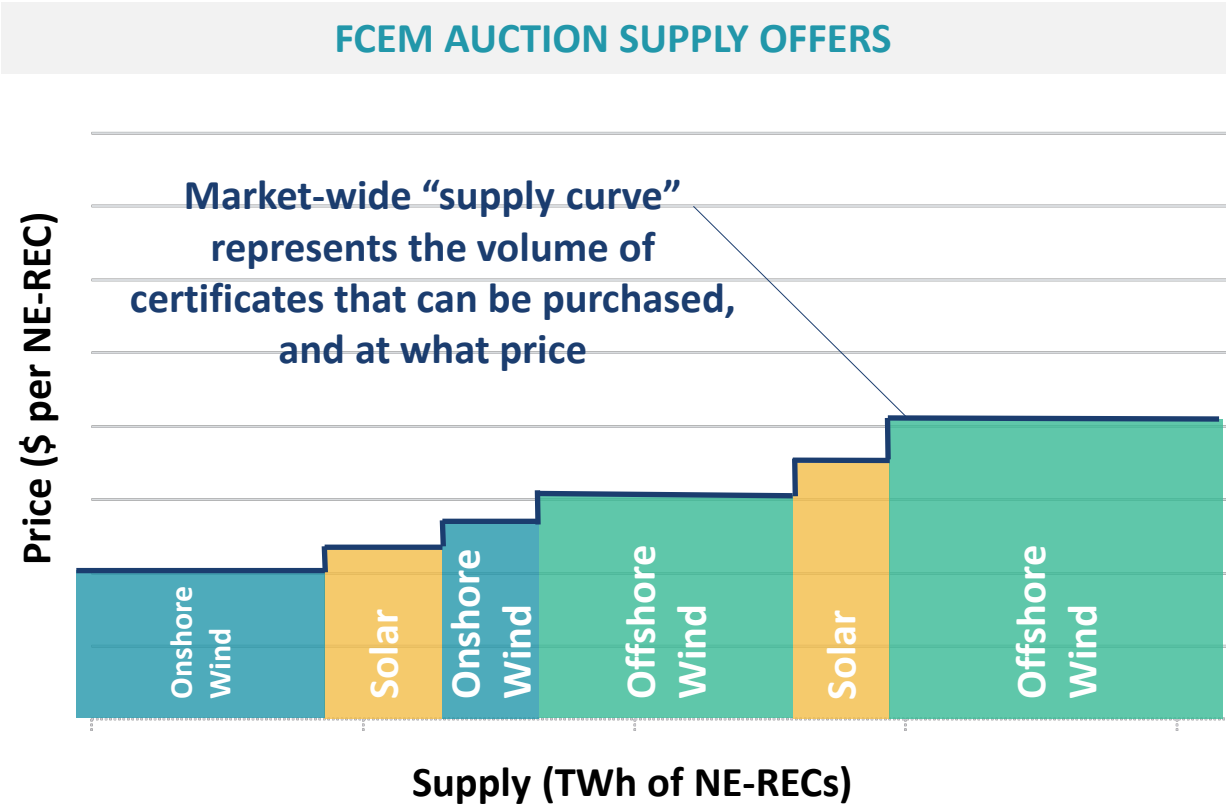


How do sellers offer into in the FCEM?

FCEM adapts regional energy markets to allow renewable and clean energy to compete and get financed through competitive markets

How it works:

- Sellers place “sell offers” that represent the volume of certificates they can deliver, and their offer price
- Resources can offer to sell one or more categories of renewable and clean energy certificates for which they are eligible
- New resources are eligible for 15 (eventually reducing to 7) year commitments

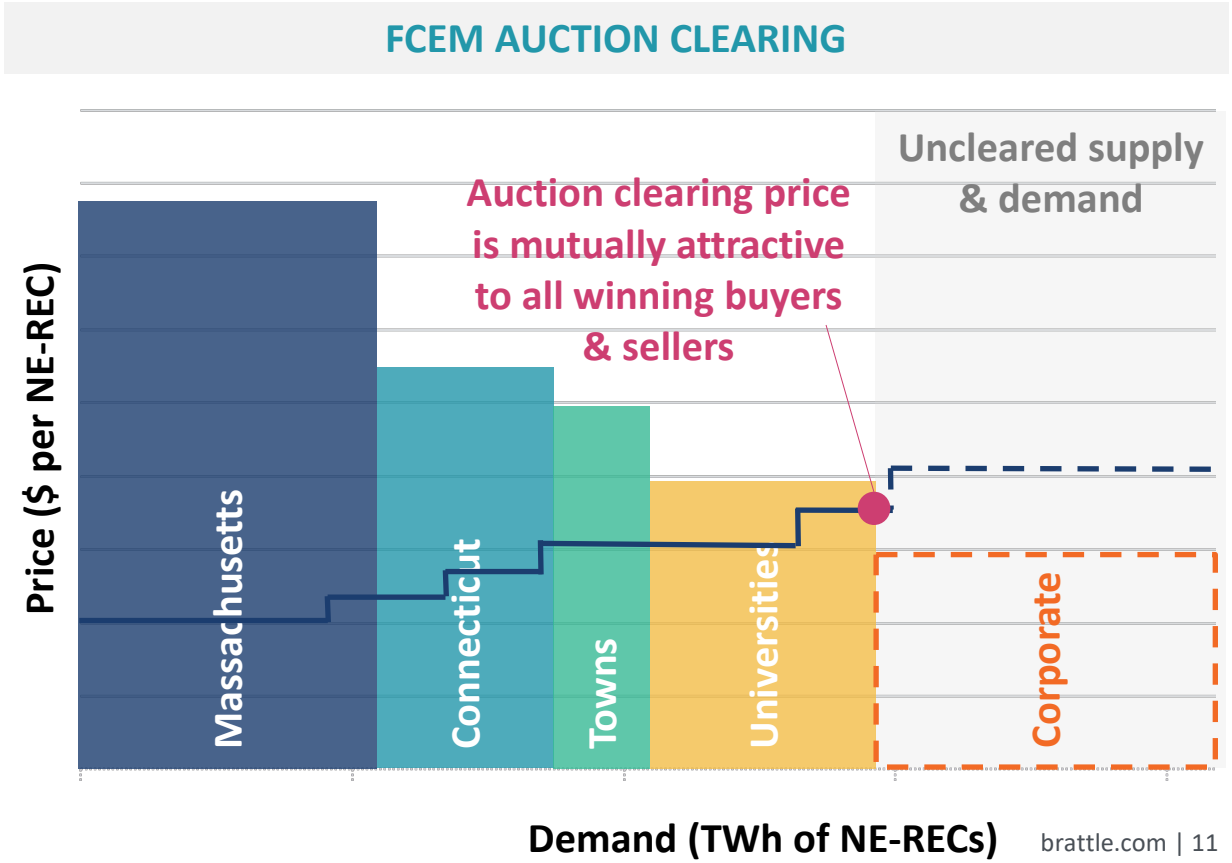


How does the auction clear and set prices?

FCEM auction clearing seeks to maximize the benefits from trade, matching aggregate buy and sell commitments at a mutually attractive price

How it works:

- FCEM-NE conducts auction clearing in an optimized format
- Buy orders and sell offers stacked in price order with matching volumes
- Single clearing price for each certificate product
- Sellers that offer at a high a price may not clear (buyers that offer at a lower price may not clear)



What products can be purchased via the FCEM?

- Products are unbundled clean or renewable energy certificates, minted and tracked by NEPOOL-GIS
- Multiple categories of products can be purchased (no maximum limit)
- **State-defined certificates** can be listed and defined by state authorities
- **Regionally-defined certificates** will be defined in the FCEM market rules (4 products proposed in initial launch)

	Product	Description & Purpose	Eligible Resources
State	**State-Defined Certificates** *Units: MWh*	• Different in all states • Enable states and retail providers to meet current laws and requirements	Determined by state laws or regulations
Regionally-Defined Products	**New England Renewable Energy Certificate** *NE-REC* *Units: MWh*	• Renewable product, eligibility consistent with most or all states' current criteria. States may decide to allow such RECs for use in compliance with their Class I RPS. • NE-RECs cannot be minted in negative price intervals (i.e., during curtailment events)	Onshore wind, offshore wind, solar, run-of-river hydro <30 MW, tidal, wave. Distributed resources eligible if qualified and delivering into ISO-NE energy markets
	Clean Energy Attribute Certificate *NE-CEAC* *Units: MWh*	• Clean energy product, includes nuclear and large hydro to maximize scope of eligible supply (increases competition, reduces system cost) • NE-CEACs cannot be minted in negative price intervals (i.e., during curtailment events)	Onshore wind, offshore wind, solar, hydroelectric, nuclear, tidal, wave. Distributed resources eligible if qualified and delivering into ISO-NE energy markets
	GHG Marginal Abatement Certificate *NE-GHG* *Units: MWh_{GHG}*	• New product focused on tons of GHG displaced by a resource (rather than MWh produced) • Aims to favor clean resources producing energy at the times and locations that displace the most GHG emissions • Storage and demand response eligible	Onshore Wind, offshore wind, solar, nuclear, hydroelectric, storage, and demand response. Storage resources eligible only for net GHG abatement from injecting at a time of higher marginal emissions than when the resource charged
	Clean Capacity Certificate *NE-CCC* *Units: MW-month*	• Allow states and customers to procure reliability/capacity needs from zero-carbon emitting resource types • Capacity value denominated identically to ISO-NE definitions	Onshore wind, offshore wind, solar, nuclear, hydroelectric, storage, and demand response. Clean capacity imports are eligible, as long as qualified under ISO-NE capacity qualification rules

How will FCEM support financing for new clean energy resources?

To achieve design objectives, the FCEM must attract large-scale and stable investment in new clean energy, reducing the overall financing risk to developers and reducing the price risk ratepayers currently assume with long term contracts

Several design elements seek to ensure FCEM can attract new resources and necessary financing:

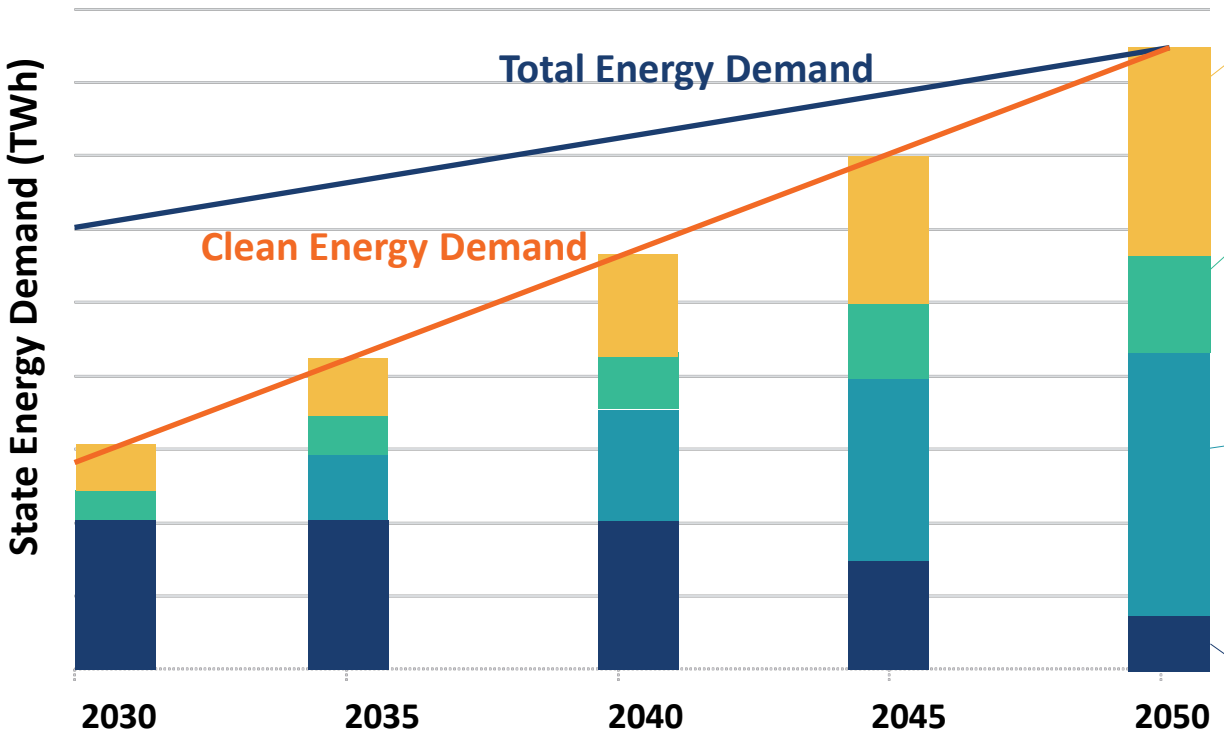
- Price lock-in for new resources, beginning at 15 years at FCEM launch, declining to 7 years as the market gains maturity
- Accessible, predictable, and annually-conducted regional auction, creating robust opportunities to monetize unhedged clean resource value over the long term
- Long-term participation commitments for state buyers and stable, price-locked commitments, ensuring no state can suddenly cease participation (graduated withdrawal can be achieved over 10 years from public notice)
- Phased entry buy bid option for state entities making large purchases that have flexibility in resource online date

Stakeholder input requested on how to improve access to financing for FCEM resources (while keeping supply-side risks with investors, and buy-side/regulatory risks with customers)

What is the role of FCEM compared to other policies & contracts?

State agencies and customers have flexibility to decide whether and how much they wish to rely on FCEM purchases vs. other policies and contracts

EXAMPLE: HYPOTHETICAL CLEAN ENERGY SUPPLY PLAN



FCEM Purchases (New or Existing)
State determines share of clean energy supply needs to procure via FCEM, potentially increasing reliance over time as market gains maturity

FCEM New Resource Purchases
A share of FCEM purchases can be earmarked for 7-15 year new resource commitments (transitions to eligibility as existing supply after initial term)

New State Contracts & Policies
New contracts and state policies will continue to be needed to focus on state policy objectives not addressed by FCEM such as employment, DEI, environmental justice (transparency in FCEM can inform better resource selection & pricing)

Existing Contracts
As existing contracts expire, resources become eligible to compete in FCEM

Questions and Discussion

Questions for Stakeholders

- Are there key aspects of the FCEM Design Proposal that have **advantages or disadvantages** over the status quo?
- Are there design aspects that are key to **financing a portfolio of new clean energy resources** and supporting the Commonwealth meeting emission reduction targets?
- Will there be sufficient **interest** from both buyers and sellers for an FCEM?
- What processes would help achieve **effective implementation** of a clean energy market design?
- Are there other clean energy market reforms that could be considered as **alternatives** or operate with an FCEM?
- Are there any other **state policy goals** that overlap with the FCEM Design Proposal?
- How should DOER proceed to **engage with regional stakeholders** to progress clean energy market reforms?

Stakeholder comments requested, due **February 17, 2023** to joanna.k.troy@mass.gov
Stakeholder feedback will inform DOER's report to legislature, due by **March 1, 2023** (required by Massachusetts' 2022 Climate Act, Section 85)

Contact Information

Kathleen Spees

PRINCIPAL | THE BRATTLE GROUP

Kathleen.Spees@brattle.com

412.445.2694

Joanna Troy

DIRECTOR, ENERGY POLICY AND PLANNING | MASSACHUSETTS DOER

joanna.k.troy@state.ma.us

Bob Grace

PRESIDENT & MANAGING DIRECTOR | SUSTAINABLE ENERGY ADVANTAGE

bgrace@seadvantage.com

508.665.5855