



Offshore Wind Development in New England

May 2021 Update

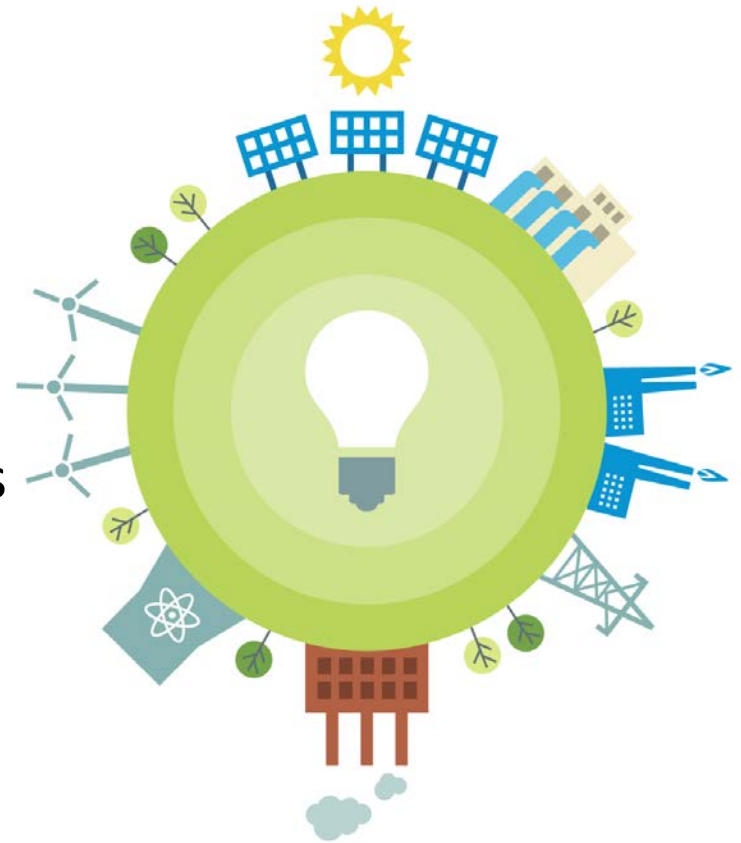
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Presentation Overview

- State Policy Drivers
- Clean Energy Procurements
- ISO Interconnection Queue
- 2019 NESCOE Economic Study
- Cape Cod Resource Integration Studies

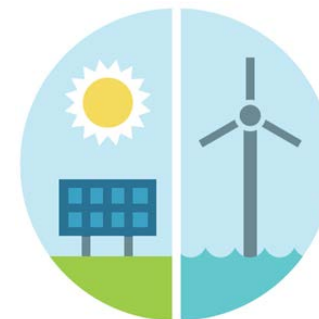


States Target Increases in Renewable and Clean Energy and Deep Reductions in CO₂ Emissions

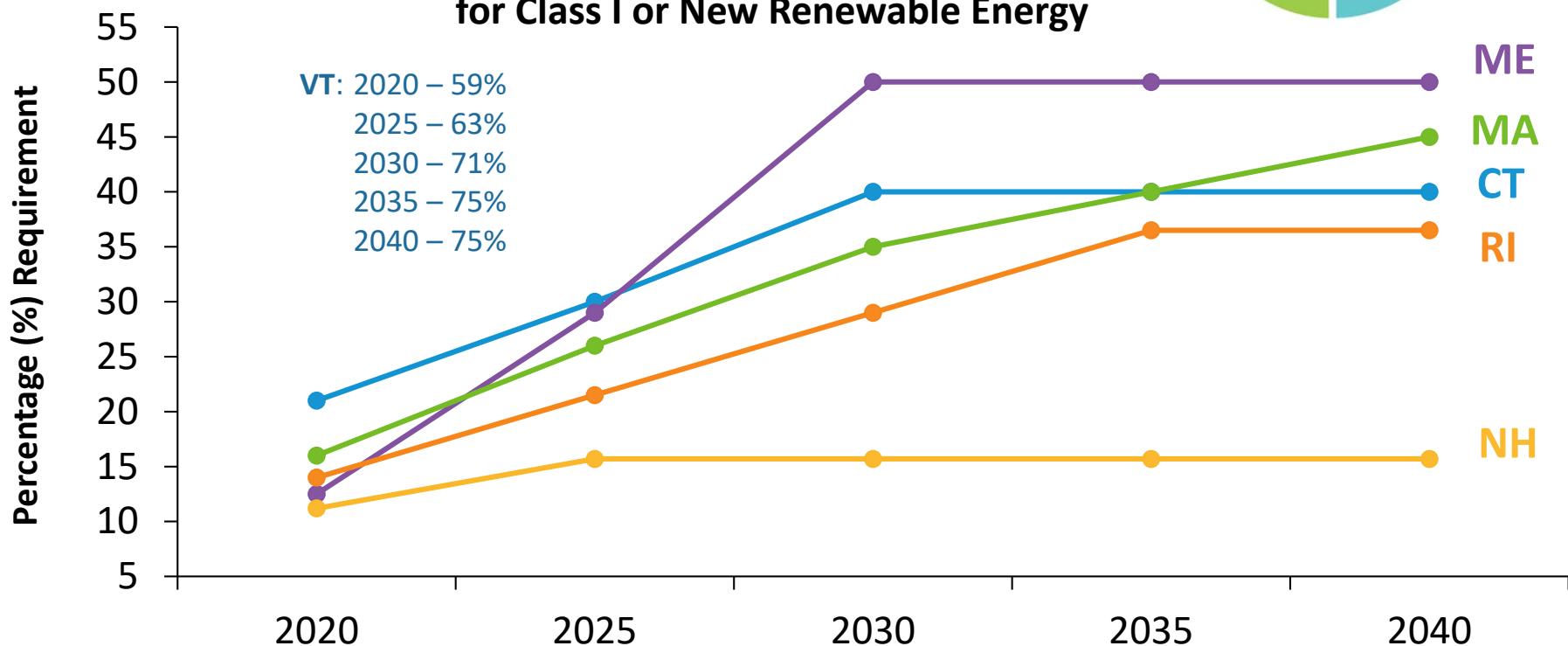
≥80% by 2050	Five states mandate greenhouse gas reductions economy wide: MA, CT, ME, RI, and VT (mostly below 1990 levels)
80% by 2050 Net-Zero by 2050	MA statewide GHG emissions limit MA clean energy standard
90% by 2050	VT renewable energy requirement
100% by 2050 Carbon-Neutral by 2045	ME renewable energy requirement ME emissions goal
100% by 2040	CT zero-carbon electricity goal
100% by 2030	RI renewable energy goal

Renewable Energy Is on the Rise

State policy requirements are a major driver



State Renewable Portfolio Standard (RPS)* for Class I or New Renewable Energy



Notes: State RPS requirements promote the development of renewable energy resources by requiring electricity providers (electric distribution companies and competitive suppliers) to serve a minimum percentage of their retail load using renewable energy. Connecticut's Class I RPS requirement plateaus at 40% in 2030 and remains at that level each year thereafter. Maine's Class I/IA RPS requirement increases to 50% in 2030 and remains at that level each year thereafter. Massachusetts' Class I RPS requirement increases by 2% each year between 2020 and 2030, reverting back to 1% each year thereafter, with no stated expiration date. New Hampshire's percentages include the requirements for both Class I and Class II resources (Class II resources are new solar technologies beginning operation after January 1, 2006). New Hampshire's Class I and Class II RPS requirements plateau at 15.7% in 2025. Rhode Island's requirement for 'new' renewable energy plateaus at 36.5% in 2035. Vermont's 'total renewable energy' requirement plateaus at 75% in 2032; it recognizes all forms of new and existing renewable energy and is unique in classifying large-scale hydropower as renewable.

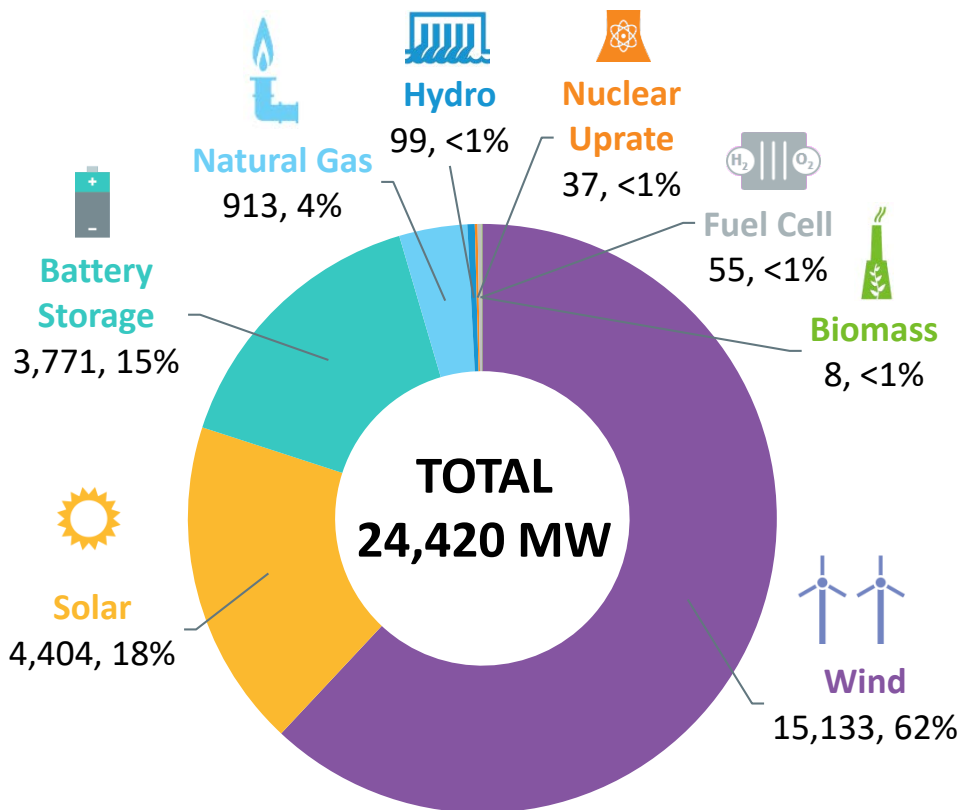
States Accelerate Clean Energy Procurements (2017-2021)

State	State Procurement Initiatives for Large-Scale Clean Energy Resources	Eligible Resources	RFP Target MW (nameplate)	Projected COD/ Selected MW
RI	2021 Offshore Wind RFP (Anticipated – Q2 2021)	Offshore Wind	600 MW	TBD
MA	2021 Offshore Wind RFP (Anticipated – May 2021)	Offshore Wind	400 to 1600 MW	TBD
ME	2020-2021 RPS RFP	ME RPS Class IA renewables	1,710,000 MWh	2022-2024
CT	2019 Offshore Wind RFP	Offshore Wind	400 – 2,000 MW	2026 804 MW
MA	2019 Section 83C II Offshore Wind RFP	Offshore Wind	800 MW	2025 804 MW
RI	2018 Renewable Energy RFP	Solar, Wind, Biomass and Other Eligible Resources	400 MW	2023 50 MW
CT	2018 Zero-Carbon Resources RFP	Nuclear, Hydro, Class I Renewables, Energy Storage	Approx. 1,400 MW (12,000,000 MWh)	2020-2026 11,658,080 MWh
CT	2018 Clean Energy RFP	Offshore Wind, Fuel Cells, Anaerobic Digestion	252 MW	2019-2023 252 MW
MA RI	2017 Section 83C I Offshore Wind RFP	Offshore Wind	800 MW (MA) 400 MW (RI)	2023 800 MW
MA	2017 Section 83D Clean Energy RFP	Hydro Import	Approx. 1,200 MW (9,554,000 MWh)	2022 9,554,940 MWh/year

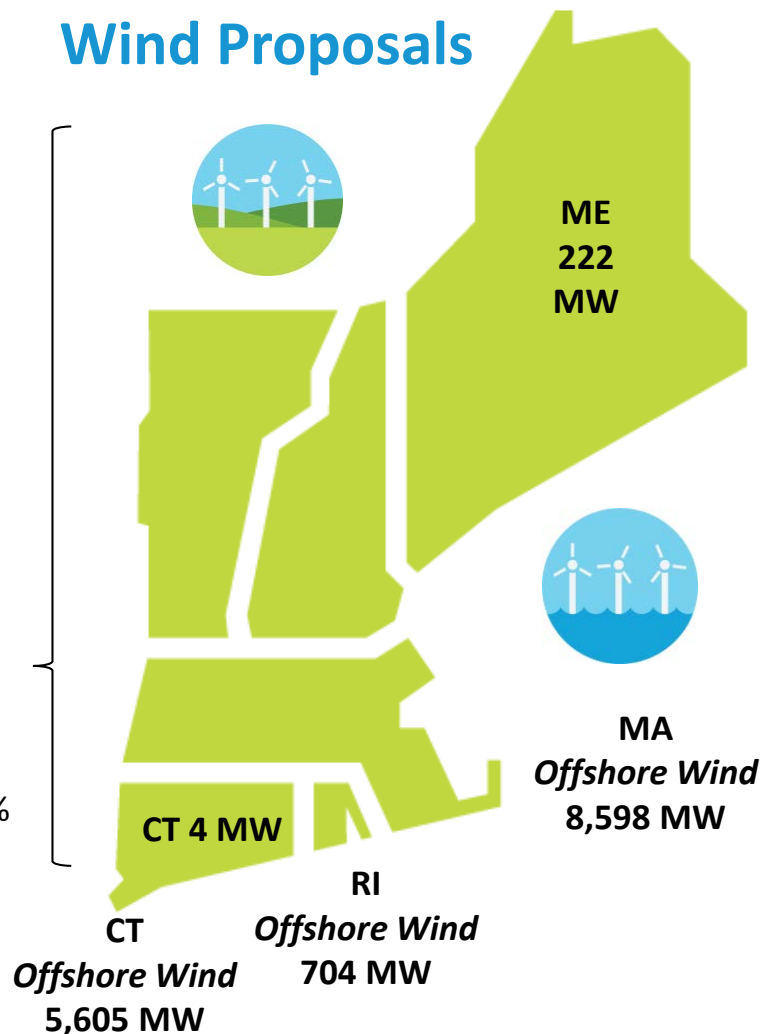


Wind Power Comprises Two Thirds of New Resource Proposals in the ISO Interconnection Queue

All Proposed Resources



Wind Proposals

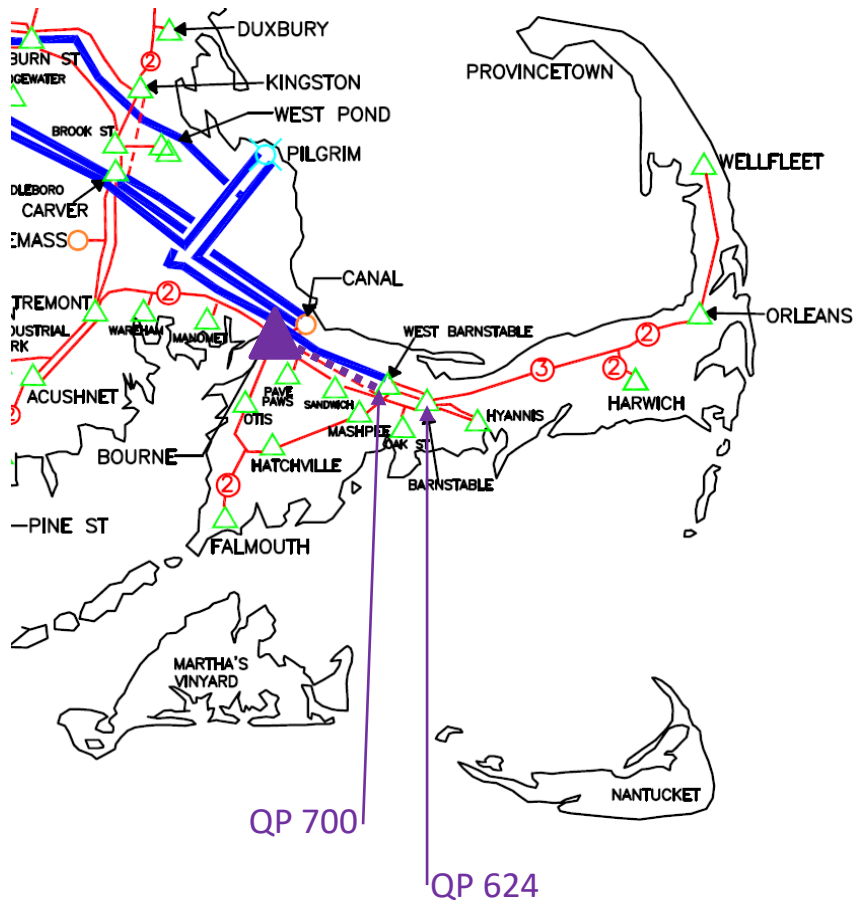


Source: ISO Generator Interconnection Queue (February 2021)
 FERC and Non-FERC Jurisdictional Proposals; Nameplate Capacity Ratings
 Note: Some natural gas proposals include dual-fuel units (with oil backup).
 Some natural gas, wind, and solar proposals include battery storage.

CAPE COD RESOURCE INTEGRATION STUDY (CCRIS)

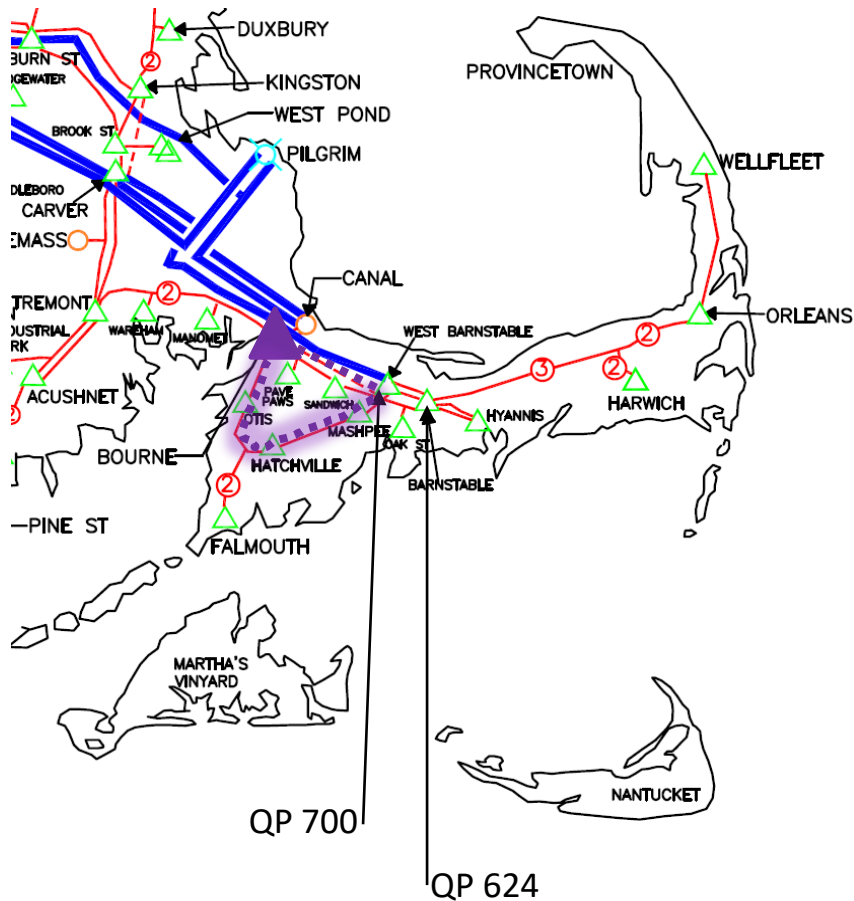
First CCRIS Status and Notice of Second CCRIS

Status of the Interconnection Process on Cape Cod



- QP 624 (800 MW) has a completed System Impact Study and will be interconnecting to the Barnstable 115 kV substation
- QP 700 (800 MW) has a completed System Impact Study and will be interconnecting to the West Barnstable 345 kV substation and will require Network Upgrades, including the following:
 - A 345 kV line from West Barnstable to Bourne
 - Converting a planned 115 kV line to 345 kV
 - New Bourne 345 kV substation
 - New 345/115 kV autotransformer at West Barnstable
- These generators and these upgrades are assumed in the base case for the First CCRIS

Conceptual Cluster Enabling Transmission Upgrades



- The CCRIS will focus on the addition of **new 345 kV transmission infrastructure between West Barnstable and Bourne**
- The CCRIS will identify the **quantity of megawatts** that could be interconnected while also recognizing and further quantifying the overall export limitation from Cape Cod

First CCRIS Conclusions

- With the addition of a new 345 kV line between West Barnstable and Bourne, a total of 2,800 MW of offshore wind can be connected to Cape Cod
 - Without needing additional significant new transmission infrastructure beyond Cape Cod
- The N-1 constraint and loss of right-of-way performance are the primary limiting issues
- Synchronous condensers instead of STATCOMs may be needed for some of the new wind farms
 - Will be confirmed in the Cluster System Impact study
- 1,600 MW (QP 624 & QP 700) of offshore wind projects have already completed their Interconnection Studies
- This means that up-to an additional 1,200 MW can connect after the inclusion of the additional Bourne – West Barnstable 345 kV line



Second CCRIS

- The Second CCRIS will build on the First, by addressing the issues identified for offshore wind additions greater than 2,800 MW in the Cape Cod area
 - N-1 345 kV overloads
 - Loss of right-of-way exposure
 - N-1-1 export limitation
- A remaining 1,600 MW may still be seeking to interconnect to Cape Cod
- An additional 1,200 MW is also seeking to interconnect near Pilgrim substation



Next Steps

- Initiate a Second CCRIS to consider the integration of additional resources in the Cape Cod area
- Present final results of the First CCRIS and cost estimates for the CETU
- Issue CRPS Draft Report for Comment
- After the publication of the final CRPS report, the ISO will open the window for eligible projects to proceed to the CSIS phase
 - Eligible projects must meet the CSIS entry requirements, including the submittal of a Cluster Participation Deposit, to proceed into the CSIS
 - Anticipated for July 2021

Questions

