

THE ENERGY IS ABOUT TO

SHIFT

**WEBINAR 1: *CLEAN ENERGY INFRASTRUCTURE
TO POWER NEW ENGLAND'S COMMUNITIES***

**Pathways to a Community-Centered,
Resilient, and Decarbonized Grid
for New England**

December 5, 2024

Run of show

- Report overview
- Brief background on New England's electrical grid
- Five decarbonization pathways for New England
- Eight key takeaways
- Grid infrastructure options and opportunities
- Part 2: Beyond infrastructure
- Q & A



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Overview

- New England states are committed to climate action
- Several deep decarbonization studies, but no clear infrastructure deployment blueprint for the region exists
- Importance of community engagement largely absent in regional modeling and planning conversations

FOR NEW ENGLAND TO BUILD OUT ITS INFRASTRUCTURE AT THE SPEED AND SCALE NEEDED TO UNLOCK A LOCAL ENERGY TRANSITION, IT WILL TAKE BUY-IN, ACCEPTANCE AND TRUST FROM THE COMMUNITIES THAT WILL HOST THESE CLEAN ENERGY RESOURCES.

The Energy Is About To Shift:

Pathways to a Community-Centered, Resilient, and Decarbonized Grid for New England



A brief history of New England's electrical grid

- New England is **heavily reliant on natural gas for electricity** and heating, but **supply is constrained** and demand is **volatile**
- **Supply constraints and volatility** contribute to **high energy prices** for the region and are associated with **significant GHG emissions**
- The region's grid also faces **resilience risks** as demonstrated by increasingly frequent and **severe winter storm events**
- The **evolution** of New England's grid is **already underway**: retirement of Mystic Station, closure of last coal plant in 2028



Literature review: 5 economy-wide decarbonization studies

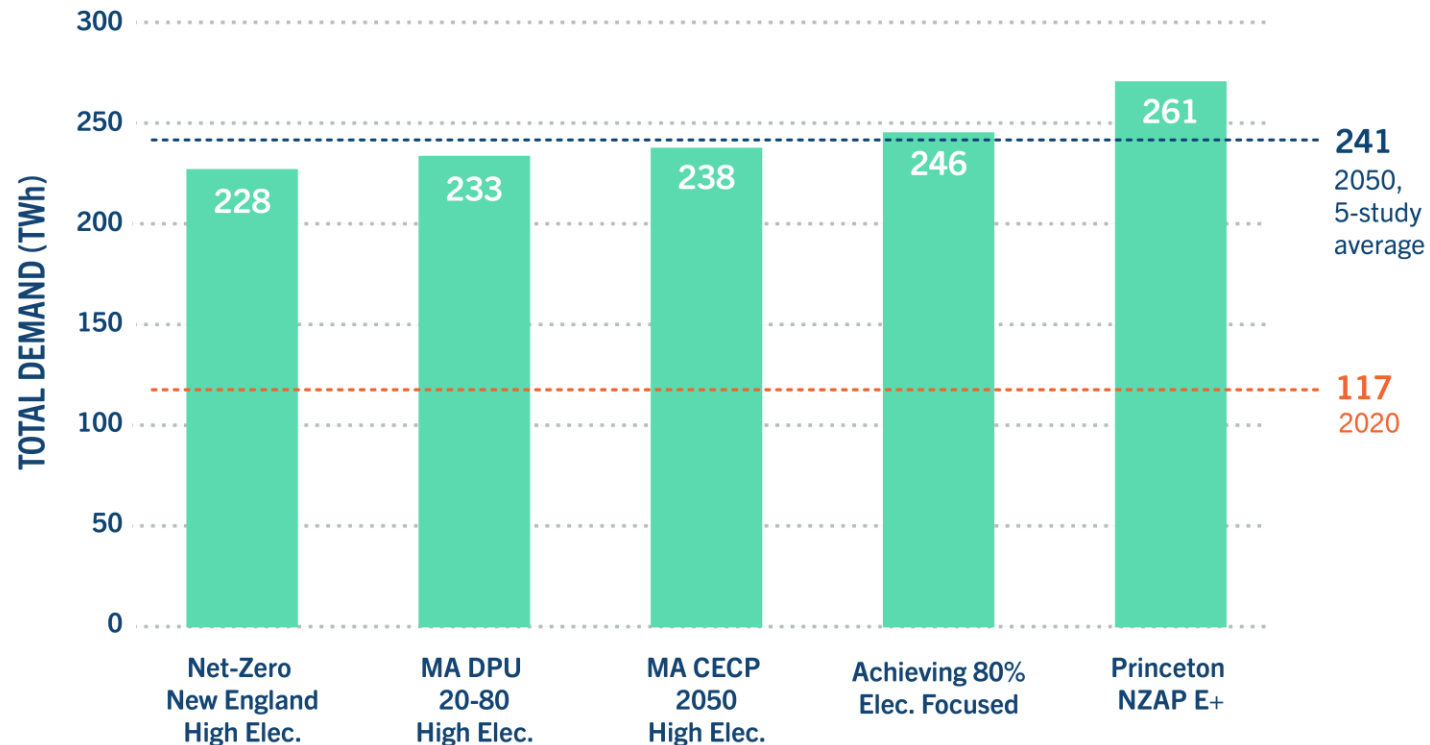
1. Net-Zero America: Potential Pathways, Infrastructure, and Impacts
 - Princeton University (2021)
2. Massachusetts Clean Energy and Climate Plan (CECP) for 2050
 - State of Massachusetts, The Brattle Group, and Evolved Energy Research (2022)
3. Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future
 - Energy Futures Initiative and E3 (2020)
4. Achieving 80% GHG Reduction in New England by 2050
 - The Brattle Group (2022)
5. Massachusetts D.P.U. 20-80 Independent Consultant Report Technical Analysis of Decarbonization Pathways
 - E3 and Scott Madden (2022)

#1: Electrification of end-uses doubles annual demand by 2050



FIGURE 2

**New England Total Annual End-Use Electric Loads:
2020 vs. 2050 5-Study Comparison**

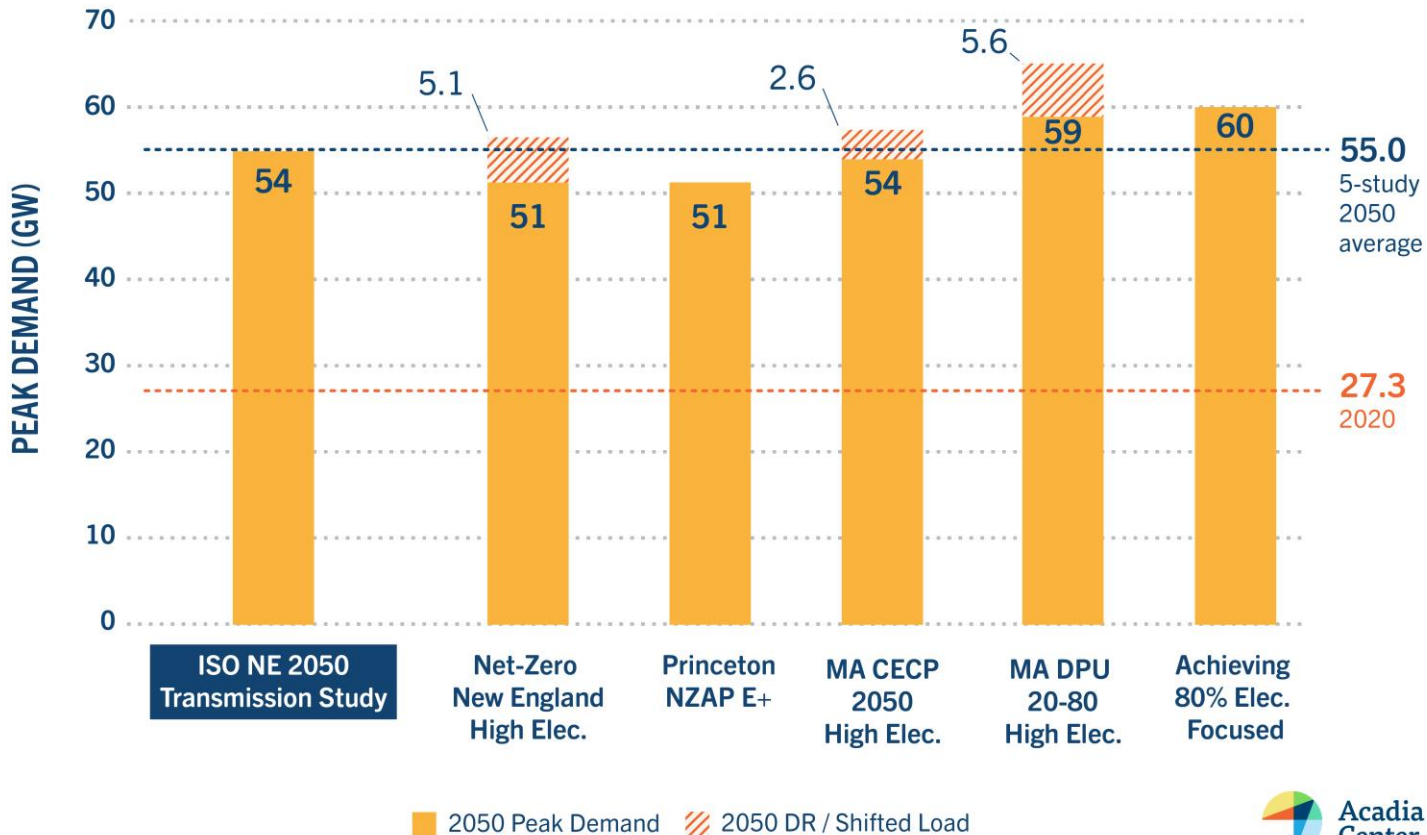


#2: Peak demand doubles, shifts to winter driven primarily by heating electrification



FIGURE 4

New England Peak Electric Demand: 2020 vs. 2050 5-Study Comparison

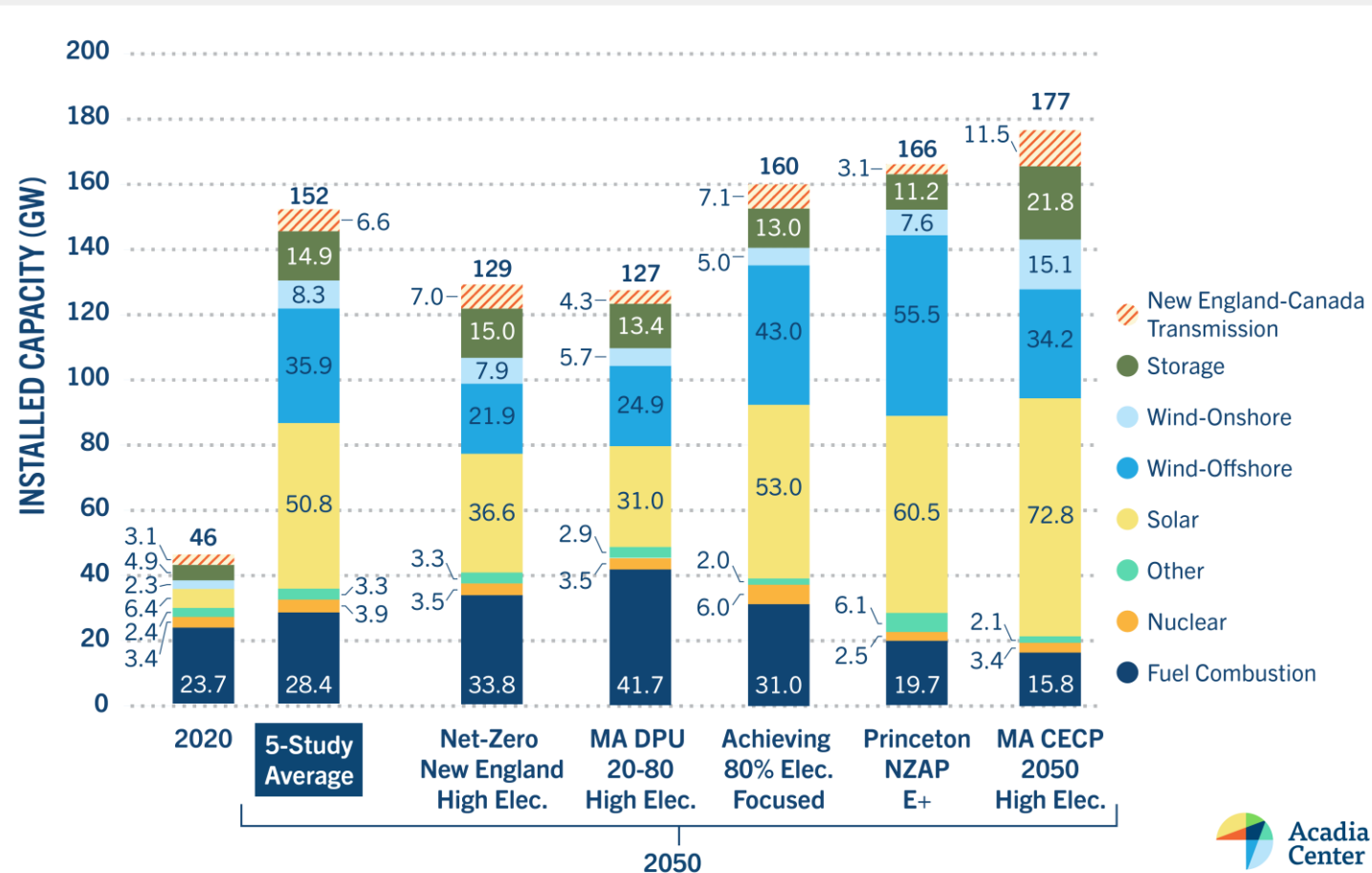


#3: 3x current installed capacity needed to meet 2050 peak demand



FIGURE 8

**Installed New England Capacity by Resource Type:
2020 vs. 2050 5-Study Comparison**

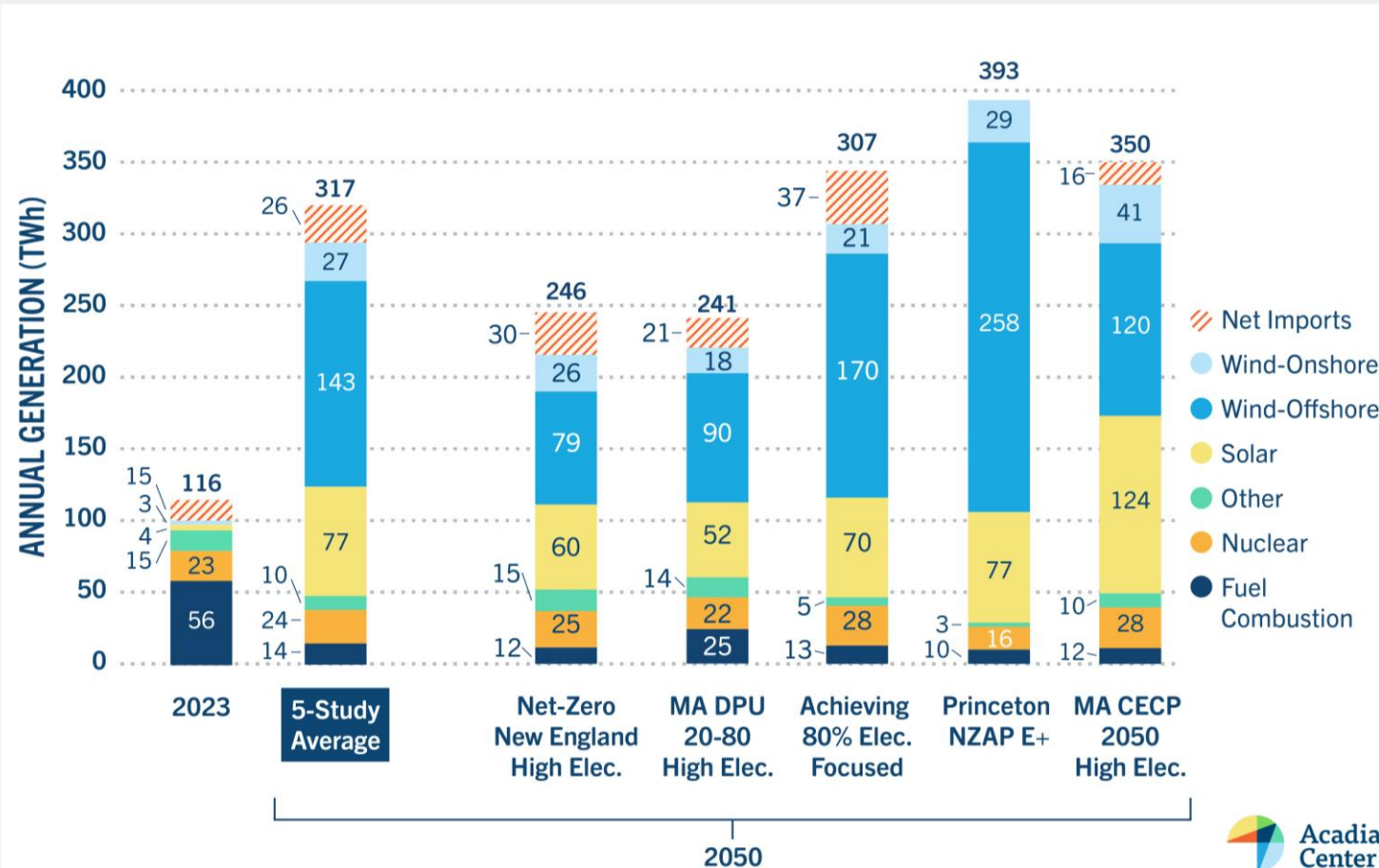


#4: Offshore wind and solar make up bulk of annual electricity generation



FIGURE 9

New England Annual Generation by Resource Type:
2023 vs. 2050 5-Study Comparison

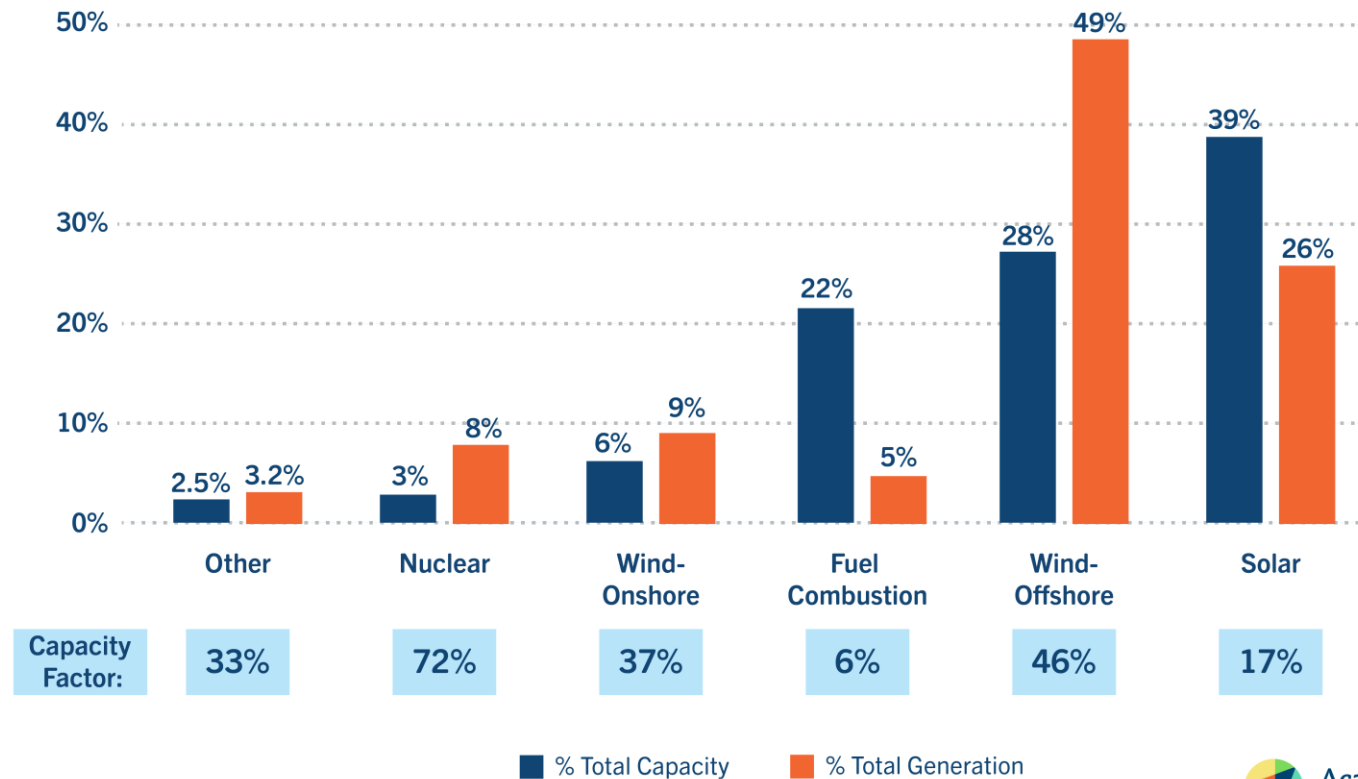


#5: Diverse portfolio of clean generation resources is key



FIGURE 10

% of New England Total Capacity, Total Generation & Capacity Factor by Resource in 2050: 5-Study Average

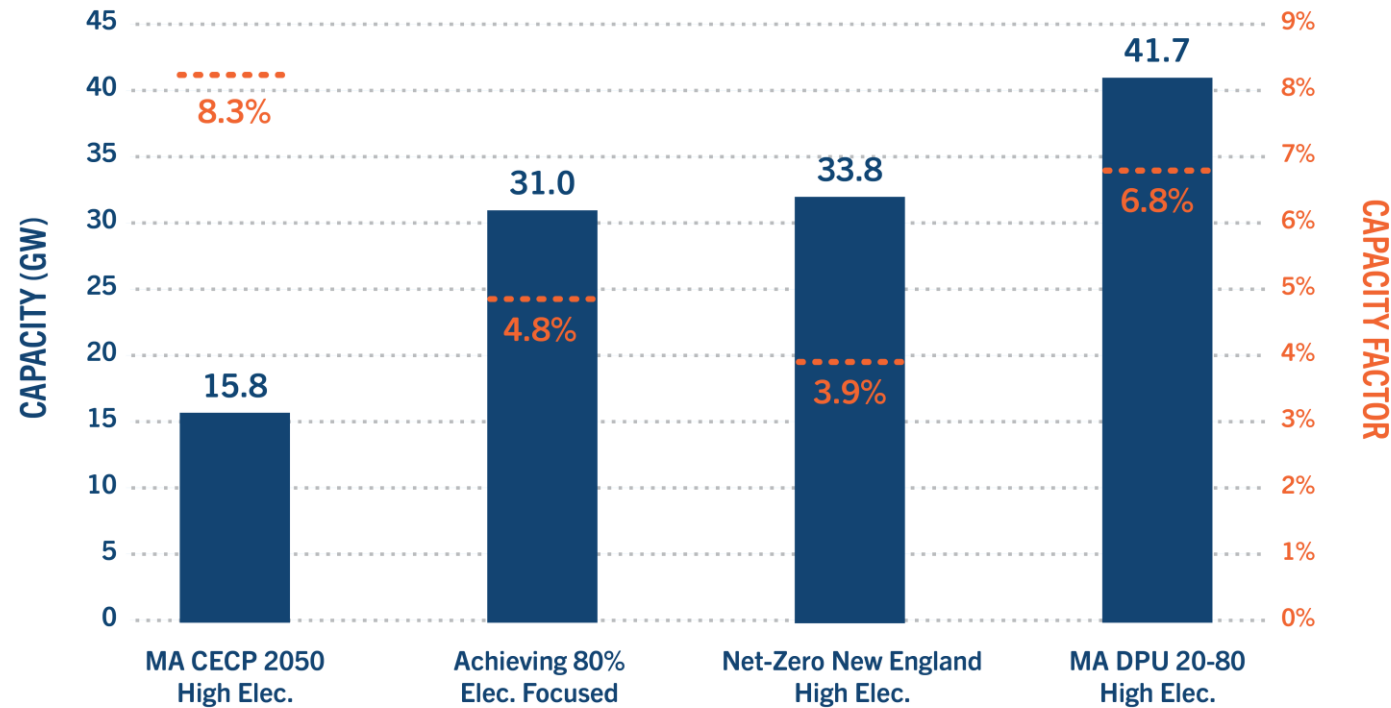


#6: Clean, dispatchable generation capacity needed to balance variable renewables



FIGURE 11

New England Firm Combustion Capacity and Capacity Factor in 2050: 4-Study Comparison



#7: Significant inter- and intraregional transmission expansion needed

- Five studies took conservative approach to modeling interregional transmission: On average **2.1X expansion of New England-Canada** transmission by 2050.
- Only one study (MA CECP 2050) explicitly modeled **all New England interregional transmission** (Quebec, New Brunswick, New York): **4.5X expansion by 2050**.
- The MA CECP 2050 “core” pathway is “All Options”
 - However, also modeled “Regional Coordination” scenario with 2.4X more additions of inter-regional transmission and 2.5X more additions of intra-regional transmission by 2050 relative to All Options
 - Reduced overall capacity needed in region by 10 GW

#8: Just 25 years left to deliver New England's grid of the future

Table 1: 2020 vs. 2050 Summary of Key Energy System Changes in New England Based on 5-Study Electrification-focused Decarbonization Pathway Literature Review

ENERGY SYSTEM FEATURE	"TODAY": NEW ENGLAND'S GRID IN 2020 (REAL-WORLD FIGURES)	"TOMORROW": NEW ENGLAND'S GRID IN 2050 (FIVE-STUDY AVERAGE)
Installed electric generation capacity	43 GW	145 GW (+237%, or >3x)
Share of renewable energy generation	7.1% of TWh	84% of TWh (up 75%)
Annual end-use electric load	117 TWh	241 TWh (+106%, or >2x)
Electric peak demand	27.3 GW	55 GW (+101%, or >2x)
Interregional transmission capacity	5.13 GW	23.74 GW (+360%, or >4.5x)
Annual net electricity imports from neighbors	15.1 TWh (2023*)	22.1 TWh (+46%, or ~1.5x) ³

Grid Infrastructure Options & Opportunities

- Deploy a **diverse portfolio of clean energy resources**
- **Get more out of current infrastructure** with reconductoring, onshoring OSW Tx at existing interconnects, and deploying Grid-Enhancing Technologies (GETs)
- **Look beyond generation** to energy efficiency, interregional transmission, and energy storage
- Align cross-border **regional planning with state vision** to keep pace with rapid technological advancements
- **Reform interconnection** alongside permitting to move more quickly from queue to operation



Join Us Next Time for Part 2: Beyond Infrastructure

- Community involvement and engagement in the energy transition is crucial for the region to meet its deployment goals
- Our report includes six case studies across the region, each focusing on a different key clean energy technology
- We also identify a suite of options and opportunities for addressing barriers to achieving equitable decarbonization, including:
 - Policy, process, and capacity challenges
 - Land use and siting challenges
 - Community engagement challenges

FOR THE REGION'S ENERGY SYSTEMS TO RAPIDLY SHIFT FROM FOSSIL FUEL TO CLEAN, RENEWABLE ENERGY, POLICIES AND PROCESSES FOR SITING, PERMITTING AND COMMUNITY ENGAGEMENT MUST BE IMPROVED AND STRENGTHENED TO UNLOCK A CLEAN ENERGY TRANSITION WITH COMMUNITY INVOLVEMENT.

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Q&A

- [Report](#)
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WEBINAR 2: *BEYOND INFRASTRUCTURE*

January 16, 2025

Noon – 1 PM ET

Zoom Registration in follow up email