

New England's Power System:  
A Collective State Update  
*Environmental Business Council NH:*  
*NH's Evolving Energy Future*  
October 2, 2019

Ben D'Antonio, Counsel & Analyst  
New England States Committee on Electricity



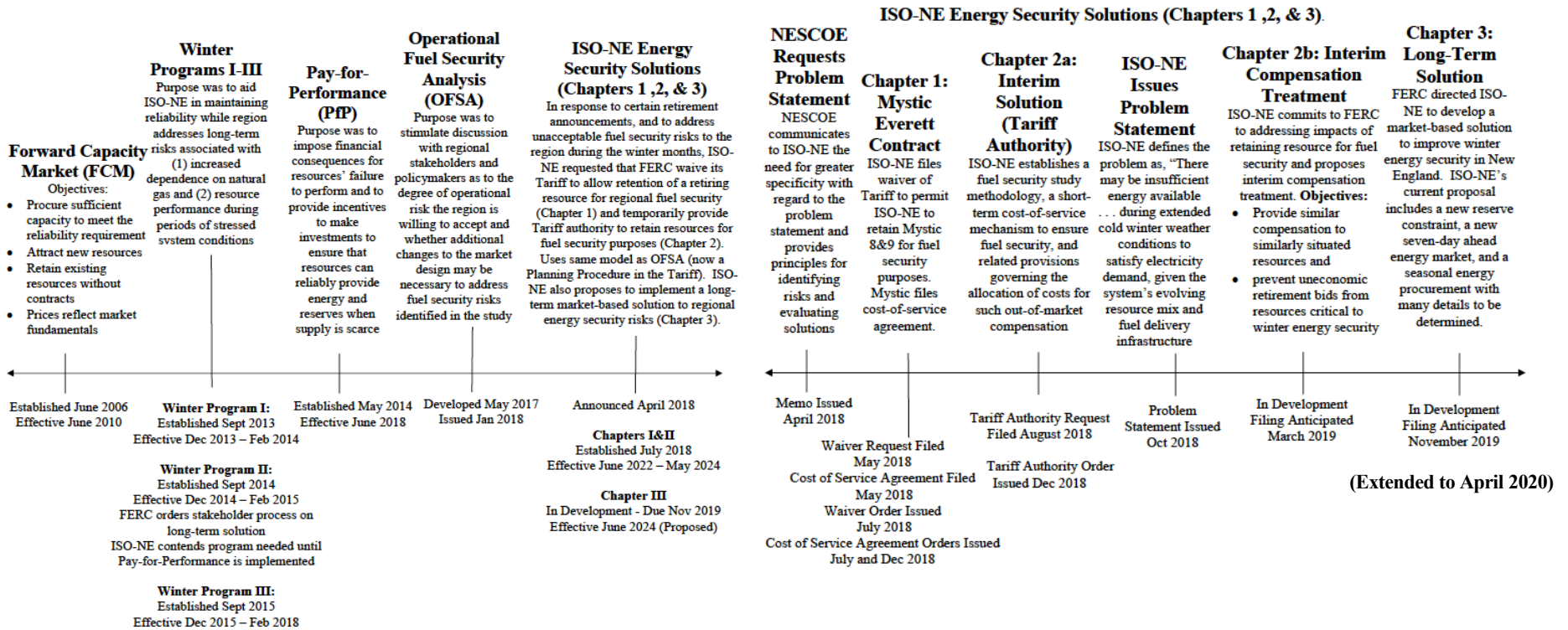
NESCOE is New England's Regional State Committee, governed by a Board of Managers appointed by each of the New England Governors to represent the collective views of the six New England states on regional electricity matters

- ✧ **Focus:** Resource Adequacy, System Planning & Expansion
- ✧ **Resources:** 5 full-time staff with diverse disciplines & experience. Consultants on markets, transmission & for independent studies
- ✧ **More information:** including filings & comments at
  - [www.nescoe.com](http://www.nescoe.com)
  - Twitter: @NESCOEStates

# Overview

- State Laws and Mechanisms
- Analysis of Renewable and Clean Energy
- Resource Adequacy and State Laws

# Regional Focus on Energy Security



# State Law Basics

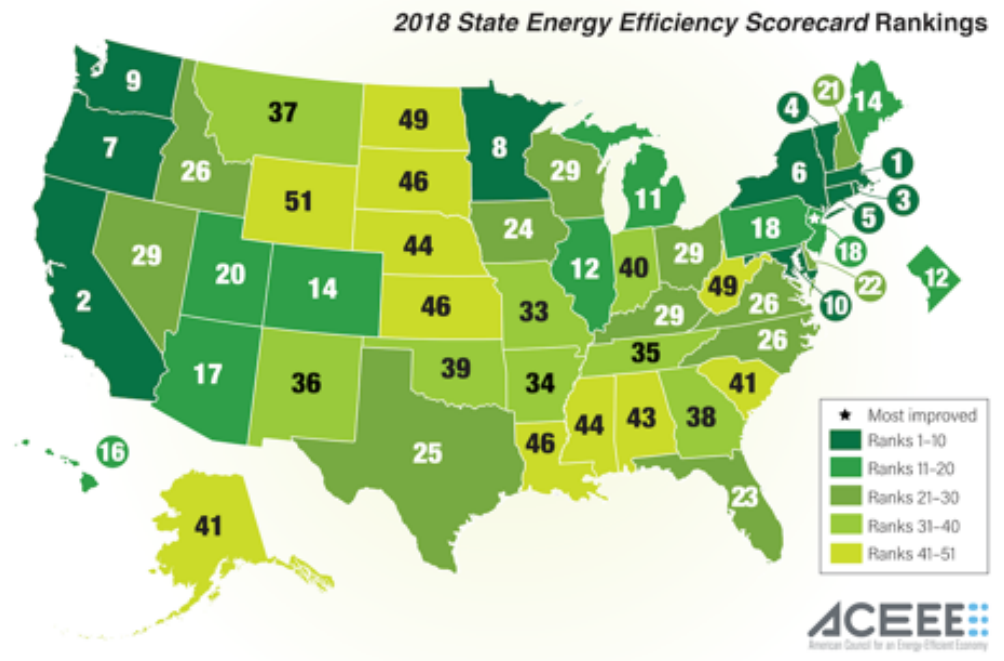
- Each New England State adopts laws and regulations reflective of the policies each state identifies as appropriate for consumers in that state as well as the mechanisms through which to implement those policies
- New England States with policies that prioritize clean energy resources have committed to explore a mechanism to value the attributes of those resources, while ensuring consumers in any one state do not fund the public policy requirements mandated by another state's law
  - Most recent example: <https://www.coneg.org/wp-content/uploads/2019/03/New-England-Governors-Statement-of-Cooperation-on-Regional-Energy-3-15-19.pdf>

# State Laws and Mechanisms

- State Laws
  - Energy Efficiency
  - Renewable Resources
  - Carbon Dioxide Emissions Reduction
- Programs and Mechanisms to Support State Laws
  - System Benefits Charge and Other Electric Bill Surcharges
  - Renewable Portfolio Standard
  - Net Metering
  - Long-Term Contracting
  - Regional Greenhouse Gas Initiative (RGGI)
  - Other Initiatives

# Energy Efficiency – the “first” fuel

Installed measures (e.g., products, equipment, systems, services, practices and/or strategies) on end-use customer facilities that **reduce the total amount of electrical energy needed, while delivering a comparable or improved level of end-use service**. Such measures include, but are not limited to, the installation of more energy efficient lighting, motors, refrigeration, HVAC equipment and control systems, envelope measures, operations and maintenance procedures, and industrial process equipment. – *ISO-NE Tariff §1.2.2.*



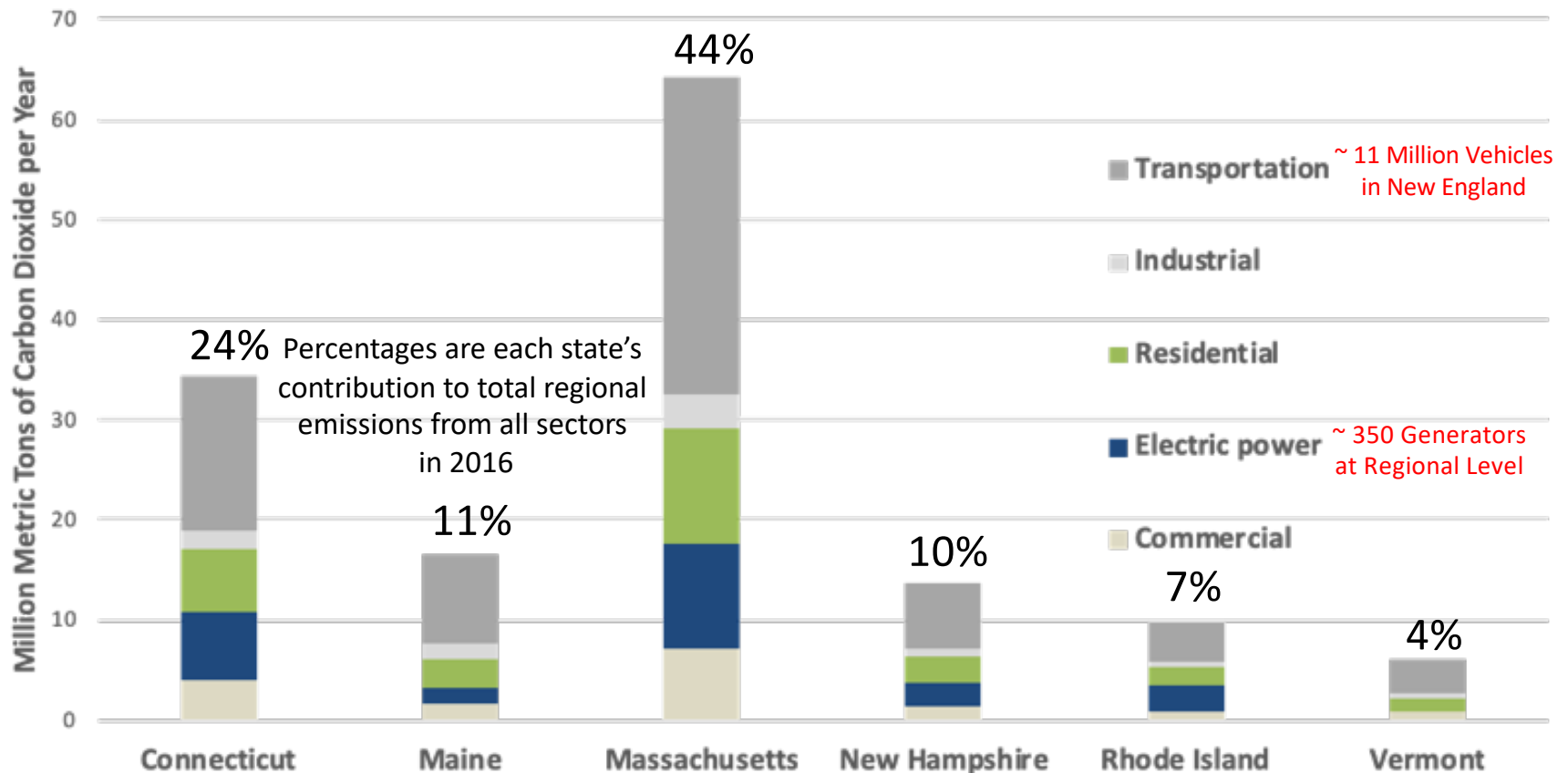
# Renewable Resources

Common Technologies	State	State-Specific Additional Technologies
<ul style="list-style-type: none"> <li>• Wind</li> <li>• Solar Photovoltaic (PV)</li> <li>• Small Hydro</li> <li>• Landfill Gas</li> <li>• Biomass (subject to eligibility requirements)</li> <li>• Anaerobic Digestion</li> <li>• Geothermal</li> <li>• Solar Thermal</li> <li>• Ocean Thermal</li> <li>• Wave</li> <li>• Tidal</li> <li>• Fuel Cells using Renewable Fuels</li> </ul>	<b>Maine</b>	Municipal Solid Waste (“MSW”) with recycling, combined heat and power (“CHP”), Thermal
	<b>Massachusetts</b>	Sustainable biomass, certain new or incremental hydroelectric, MSW with recycling
	<b>Connecticut</b>	Sustainable biomass, MSW, fuel cells using non-renewable energy, CHP, new hydro, large-scale hydro (only if shortfall in Class I resources, capped at 5% in 2020), low-emission advanced renewable energy conversion technologies
	<b>Rhode Island</b>	Sustainable biomass
	<b>Vermont</b>	Large Hydro, small distributed generation
	<b>New Hampshire</b>	“Useful thermal energy”, CHP, new or co-fired biomass, biodiesel



# Carbon Dioxide Emissions Sources

Energy Related Carbon Dioxide Emissions,  
by Sector 2016



Sources: U.S. Energy Information Administration, U.S. Department of Transportation, ISO New England  
 Note: EIA's electric power emissions represent generation that is geographically located within the state.  
 Not all states measure emissions in this manner.

# Carbon Dioxide Emissions Reduction Targets

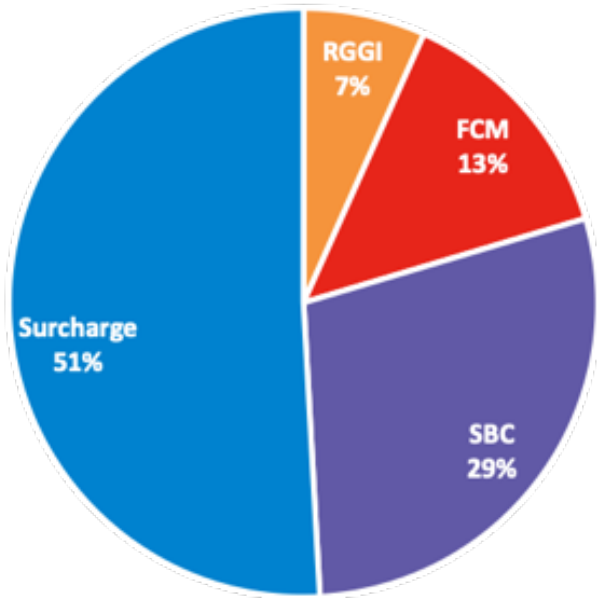
	Power Sector	Economy-Wide	Legal Authorities
<b>Connecticut</b>	Regional Greenhouse Gas Initiative (RGGI):  2.5% per year reduction until 2020; Approximately 750 thousand tons per year until from 2021-2030	10% below 1990 levels by 2020 45% below 2001 levels by 2030 80% below 2001 levels by 2050	Conn. Gen. Stat. §§ 22a-200a and 22a-200c
<b>Maine</b>		10% below 1990 levels by 2020 80% below 1990 levels by 2050	38 Me. Rev. Stat. ch. 3-A and 3-B
<b>Massachusetts</b>		25% below 1990 levels by 2020 80% below 1990 levels by 2050	Mass. Gen. Laws ch. 21A § 22 and ch. 21N § 3
<b>New Hampshire</b>		n/a	N.H. Rev. Stat. Ann. § 125:O
<b>Rhode Island</b>		10% below 1990 levels by 2020 45% below 1990 levels by 2035 80% below 1990 levels by 2050	R.I. Gen. Laws §§ 42-6.2-2, 42-17.12(19), 23-23, and 23-82
<b>Vermont</b>		40% below 1990 levels by 2030 80-95% below 1990 levels by 2050	30 V.S.A. § 255 2016 Comprehensive Energy Plan

# **PROGRAMS AND MECHANISMS TO SUPPORT RESOURCES REQUIRED BY STATE LAWS**

The following section provides information on a range of programs and mechanisms used by New England states to support certain types of electric generation resources that are able to satisfy public policies reflected in statutes and regulations.

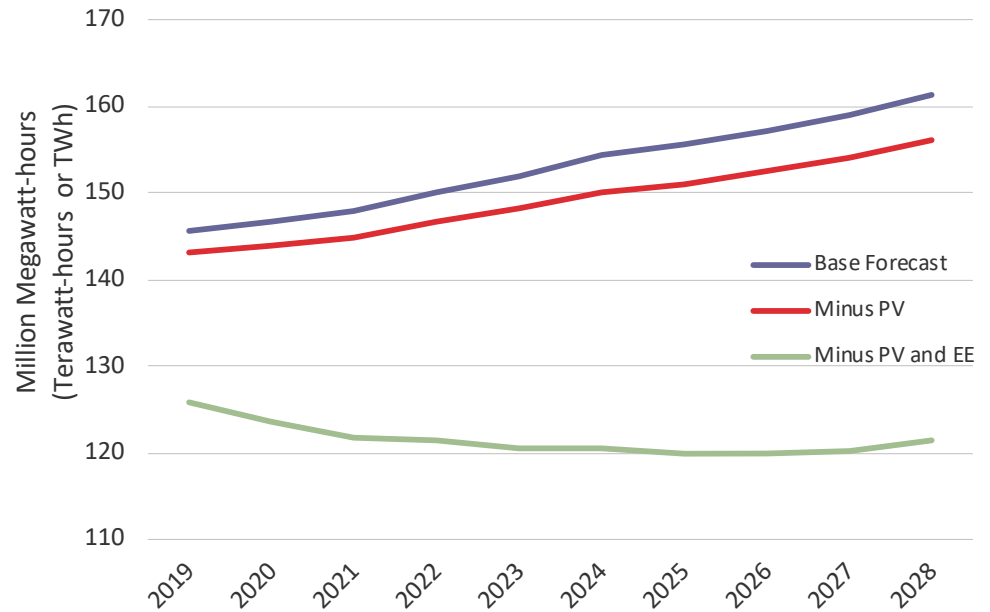
# System Benefit Charge (SBC) and Other Electric Bill Surcharges

Average Annual Energy Efficiency Budgets, by Funding Source 2019-2024 ~ \$1.1 Billion per Year



Source: ISO-NE Energy Efficiency Forecast

Forecasted Annual Energy Demand, After Impact of Solar PV and Energy Efficiency New England Region Wide



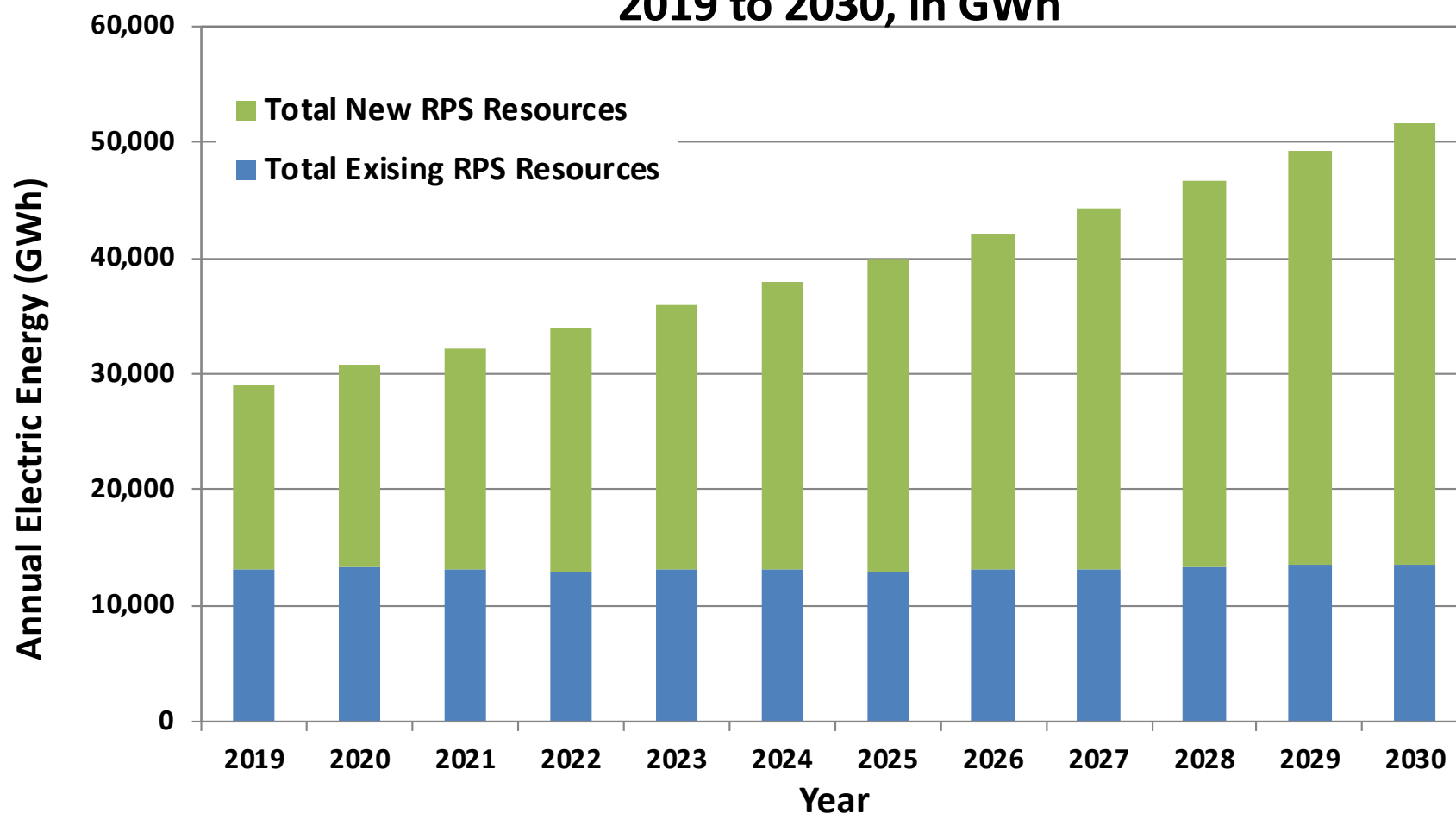
Source: ISO-NE Capacity Energy Loads and Transmission Report

# Renewable Portfolio Standard

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Connecticut</b>												
Class I	19.5%	21.0%	22.5%	24.0%	26.0%	28.0%	30.0%	32.0%	34.0%	36.0%	38.0%	40.0%
Class II	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Class III	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
<b>Maine</b>												
Class I	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Class Ia		2.5%	5.0%	8.0%	11.0%	15.0%	19.0%	23.0%	27.0%	31.0%	35.0%	40.0%
Class II	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
<b>Massachusetts</b>												
Class I	14.0%	16.0%	18.0%	20.0%	22.0%	24.0%	26.0%	28.0%	30.0%	32.0%	34.0%	35.0%
Class IIa	2.7%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Class IIb	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Clean Energy Standard	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	5.0%
<b>New Hampshire</b>												
Class I	9.6%	10.5%	11.4%	12.3%	13.2%	14.1%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Class II	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Class III	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Class IV	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
<b>Rhode Island</b>												
Existing	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
New	12.5%	14.0%	15.5%	17.0%	18.5%	20.0%	21.5%	23.0%	24.5%	26.0%	27.5%	29.0%
<b>Vermont</b>												
Distributed Generation	2.2%	2.8%	3.4%	4.0%	4.6%	5.2%	5.8%	6.4%	7.0%	7.6%	8.2%	8.8%
Standard	52.8%	56.2%	55.6%	55.0%	58.4%	57.8%	57.2%	60.6%	60.0%	59.4%	62.8%	62.2%

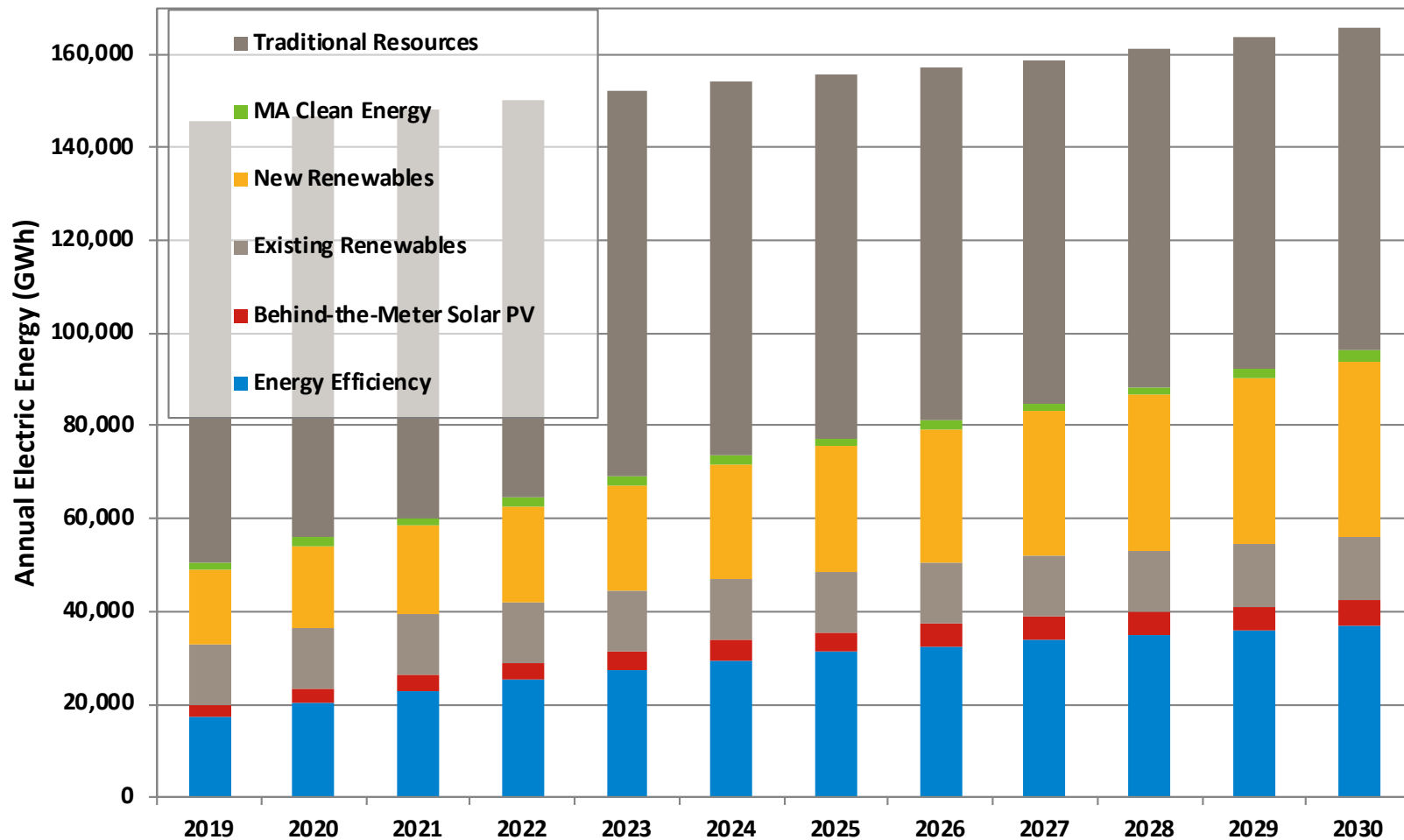
# Renewable Portfolio Standard

Total projected RPS targets (all classes) for New England, 2019 to 2030, in GWh



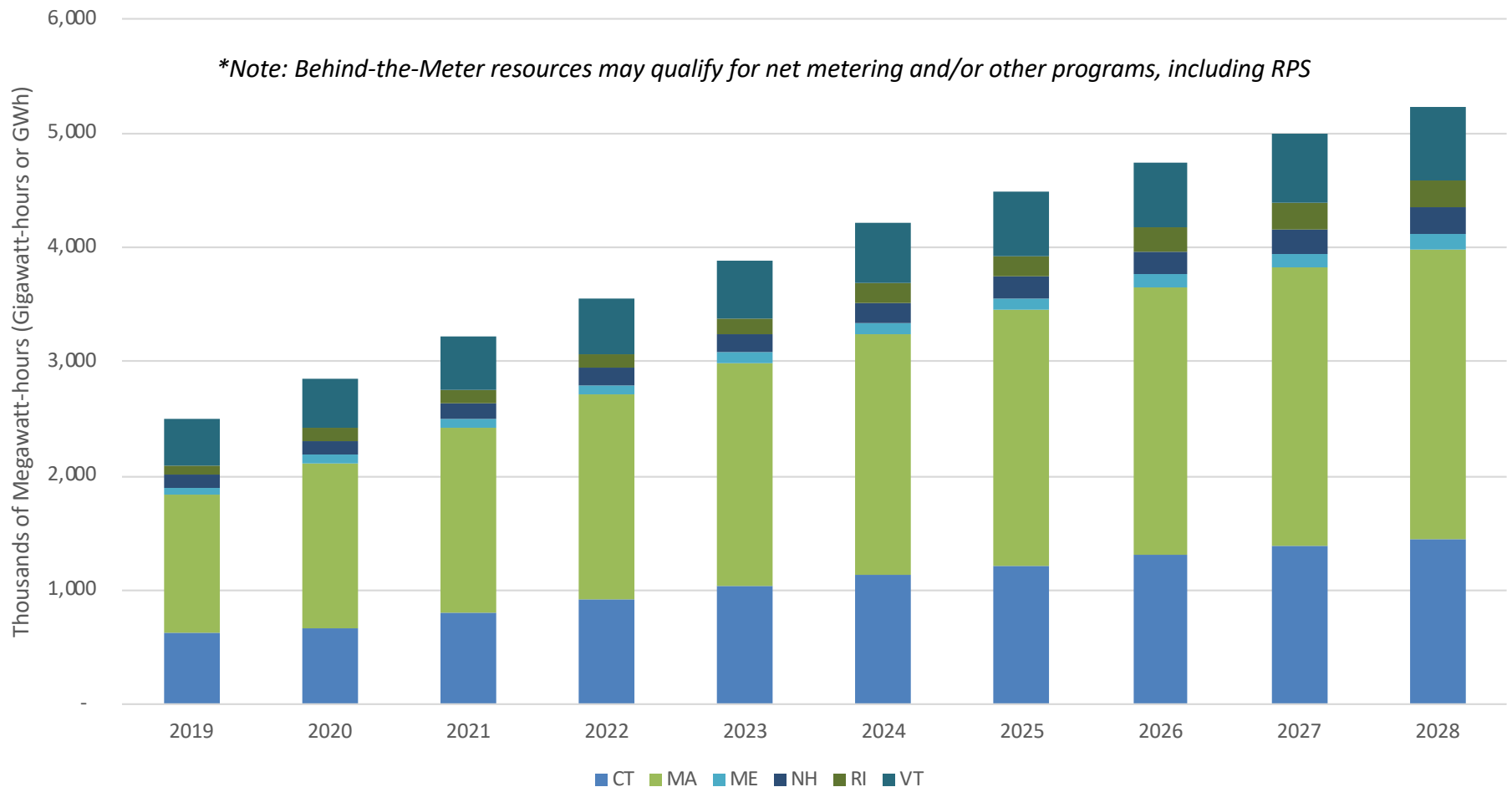
# Public Policy Resource Outlook

Total projected policy resource targets (all classes) and goals for New England, 2019 to 2030, in GWh



# Behind-the-Meter Solar

Forecasted Energy from Behind-the-Meter Solar PV Resources, GWh



Source: ISO New England Solar PV Forecast



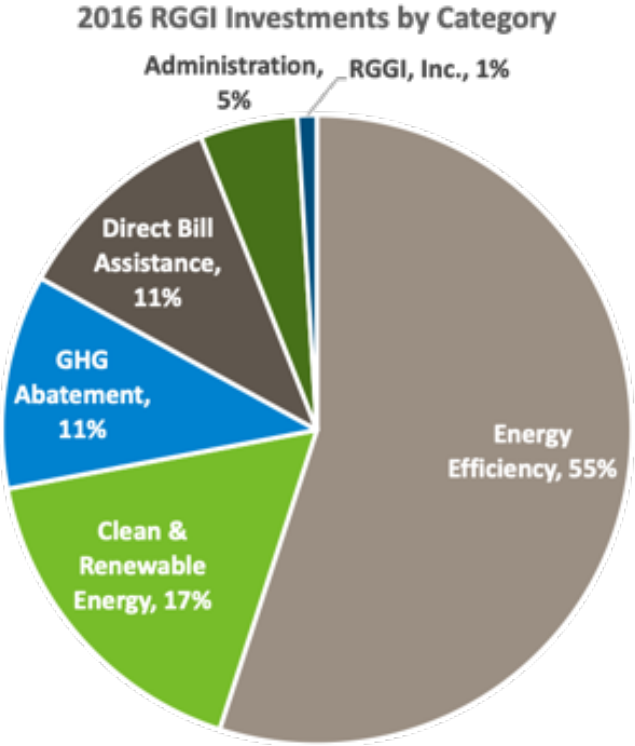
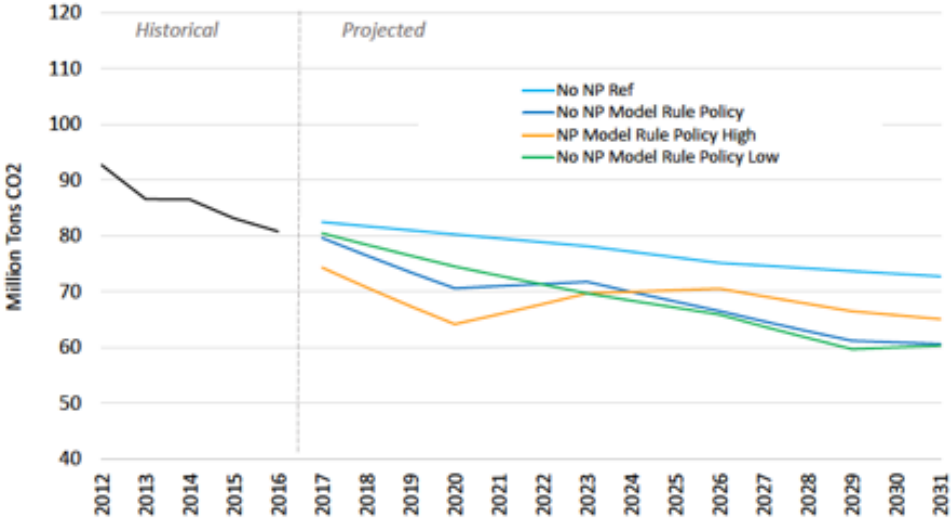
# Long-Term Contracts

- Clean Energy Request for Proposals (RFP)
  - Entities from three of the New England States - Connecticut, Massachusetts, and Rhode Island - jointly issued an RFP from private developers of clean energy and transmission. The three states selected projects that were, collectively, about 460 MW. None of the projects included transmission.
- Massachusetts Long-Term Contracts for Clean Energy
  - Massachusetts Electric Distribution Companies (EDCs) entered into long-term contracts with H.Q. Energy Services Inc. and related transmission agreements with Central Maine Power Company (CMP) in connection with the New England Clean Energy Connect 100% Hydro project. The Massachusetts Department of Public Utilities (DPU) approved the long-term contracts with Hydro Quebec Energy Services, Inc. FERC approved the related transmission agreements with CMP. The project is subject to further federal review and approval.
- Connecticut, Massachusetts, and Rhode Island Long-Term Contracts for Off-shore Wind
  - Massachusetts EDCs entered into long-term contracts with Vineyard Wind LLC for an 800 megawatt offshore wind generation project. In 2019, the DPU approved the Vineyard Wind contracts and subsequently approved a request by the EDCs to issue an RFP soliciting additional offshore wind generation.
  - The Rhode Island Public Utilities Commission has approved a long-term contract for the Revolution Wind 400 megawatt offshore wind generation project.
  - In 2018, the CT Public Utilities Regulatory Authority approved long-term contracts for the 200 megawatt Revolution Wind project.
- Connecticut Zero Carbon Solicitation and Procurement
  - Connecticut selected two nuclear power bids from Millstone Power Station and Seabrook Nuclear Power Plant, along with nine solar project bids totaling 165 MW – two of which are paired with energy storage – and one 104 MW offshore wind project in a solicitation for zero-carbon electricity-generating resources.

*\*\*Note: Several states have already procured clean energy resources via long term contract under these and other existing state energy procurement authorities\*\**

# Regional Greenhouse Gas Initiative (RGGI)

RGGI CO2 Emissions – 2017 Model Rule Review, Draft Model Rule Policy Scenario Results

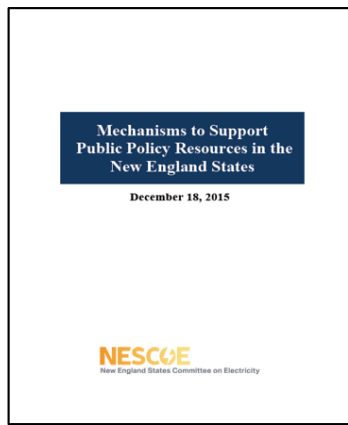


Source: [www.RGGI.org](http://www.RGGI.org)

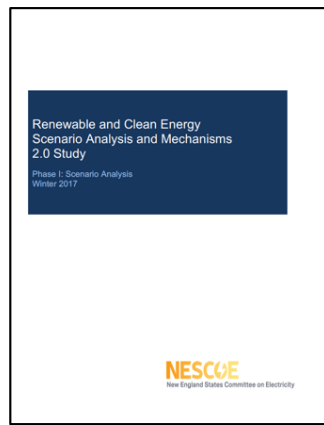
# Other Initiatives

- Green Banks
  - Connecticut Green Bank
  - Rhode Island Infrastructure Bank
  - Vermont Economic Development Authority
- Grid Modernization
  - Distribution System Planning
- Storage
  - Massachusetts Energy Storage Initiative
- Electric Vehicles
  - New England Governors – Eastern Canadian Premiers’ 2014 Resolution: five percent (5%) fleet market share penetration of alternative fuel vehicles by 2020
  - Four New England States joined the 2013 State Zero-Emissions Vehicle Program Memorandum of Understanding:
    - Connecticut: 175,000 (*est.*) by 2025
    - Massachusetts: 300,000 by 2025
    - Rhode Island: 43,000 by 2025
    - Vermont: 18,000 by 2025

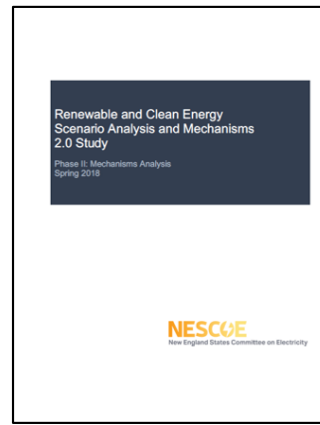
# Renewable and Clean Energy Analysis



2015  
Whitepaper



2017  
Scenario Analysis  
Modeling



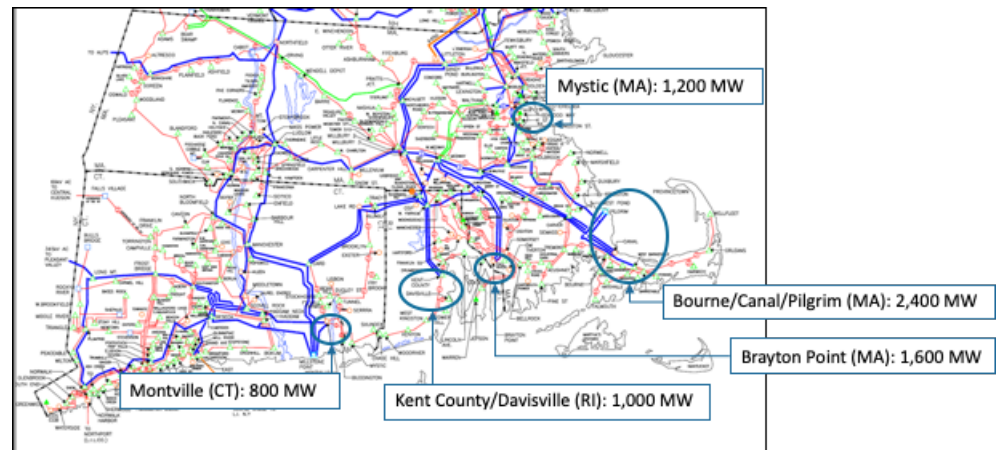
2018  
Mechanisms  
Analysis

**This analysis is to inform consideration of options; it is not a recommendation or an expression of preferences**

For more information, please visit the Resource Center at NESCOE's Website

[nescoe.com](http://nescoe.com)

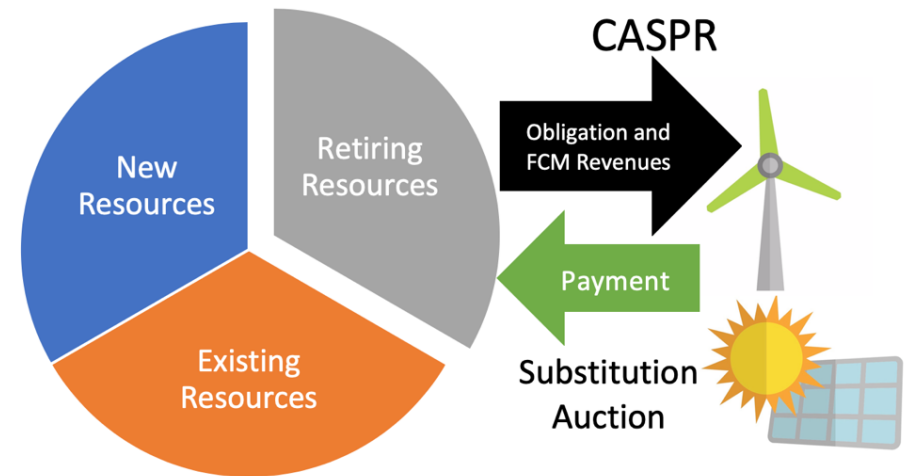
2019-2020  
Off-shore Wind  
Integration



# Resource Adequacy and State Policies

- States' long-term contracts with resources capable of supporting state policies may not be counted toward ISO-NE's FCM procurement target
- Renewable Technology Resource (RTR) Exemption Phasing-out
- ISO-NE's "CASPR" reforms allow new resources supported by long-term contracts to buy-out retiring resources' capacity supply obligations

Forward Capacity Market



[nescoe.com](http://nescoe.com)

Home | Nescoe

nescoe.com 67% Search

**NESCOE**  
New England States Committee on Electricity

CONTACT FAQ

About NESCOE Our Work Governors' Initiatives Focus Areas Resource Center News and Updates

### WHAT IS NESCOE?

NESCOE is a not-for-profit entity that represents the collective perspective of the six New England Governors in regional electricity matters and advances the New England states' common interest in the provision of electricity to consumers at the lowest possible prices over the long-term, consistent with maintaining reliable service and environmental quality.

WHO WE ARE OUR WORK

### Our resources

Communications and Filings provides access to documents submitted by NESCOE to the Federal Energy Regulatory Commission (FERC), ISO New England (ISO-NE) and other entities, as well as presentations to various audiences.

VISIT RESOURCE CENTER