



Environmental Update

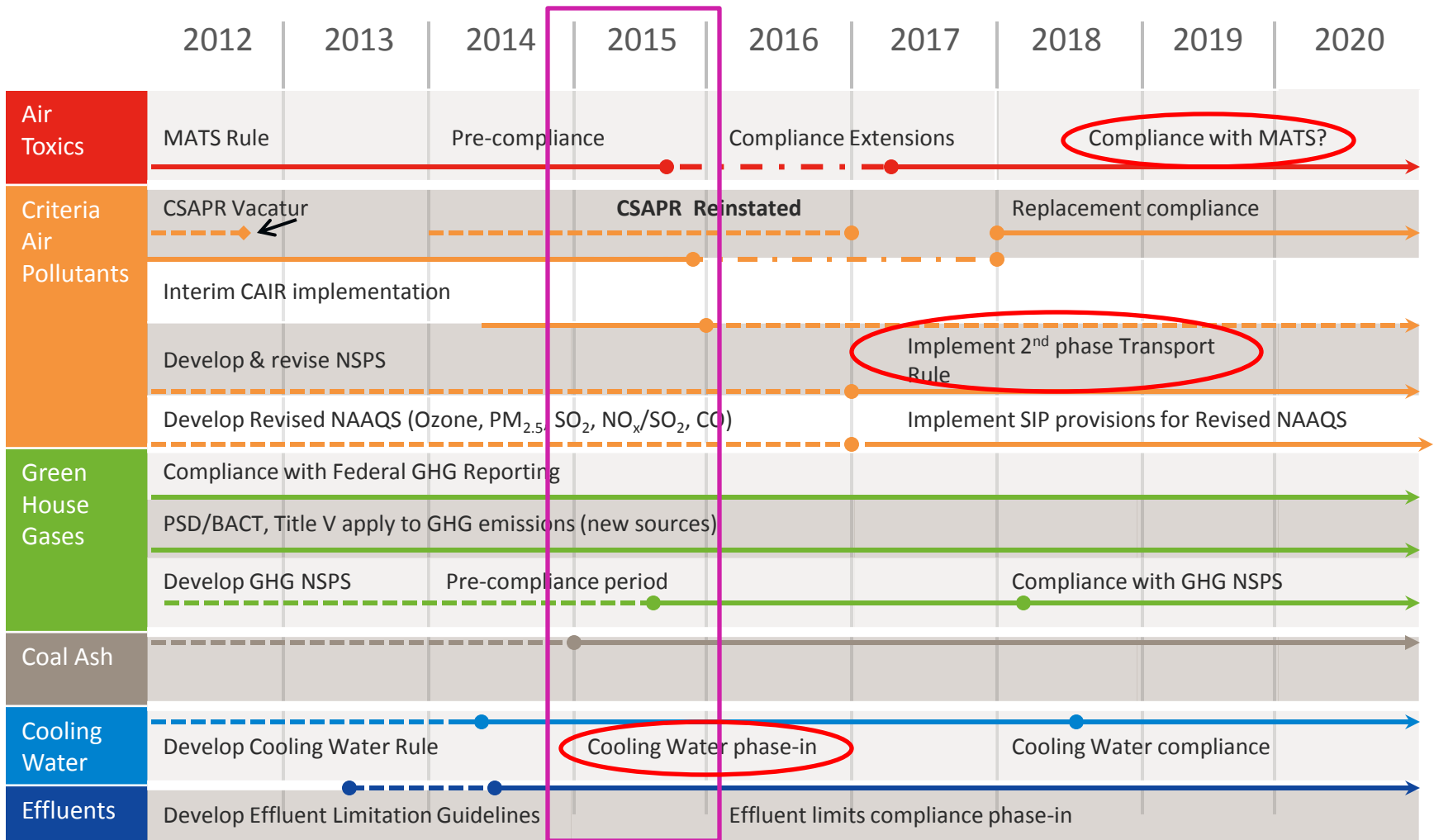
Planning Advisory Committee

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SENIOR ANALYST, SYSTEM PLANNING



Timeline of Major EPA Regulatory Actions Impacting Electric Generators

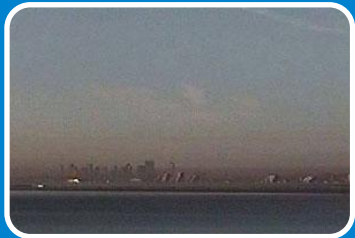


Major Environmental Regulatory Activity Affecting Generators



Mercury & Air Toxics Standards

- Implementation well underway in New England
- Technical revisions and corrections proposed in December 2014
- Supreme Court hears MATS challenge, decision expected by June 2015



Ozone

- More stringent ozone standard range (60-70 ppb) proposed
- Final action due by October 2015
- Affected areas expected to expand across southern New England

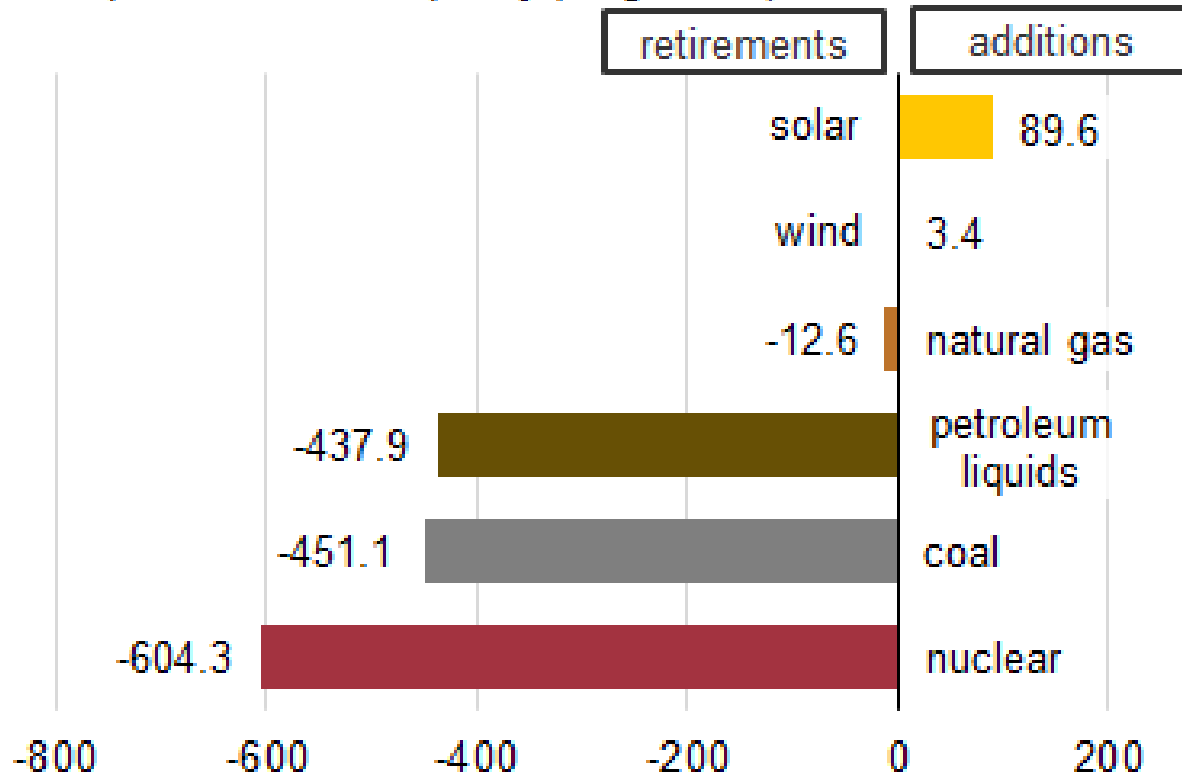


Cooling Water Intake Rule

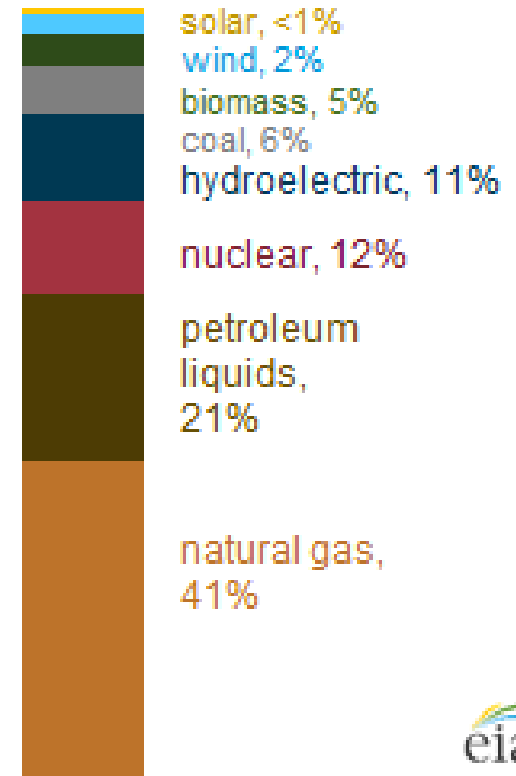
- Affected generators may need operational changes or retrofits
- Requires Endangered Species Act habitat and species protection
- Additional litigation ongoing through 2015

System Environmental Performance Will Differ With Changes in Capacity Mix

New England generator retirements and additions (2014)
nameplate summer capacity (megawatts)



capacity mix, end of 2014
percent of total (33,247 MW)



Source: Energy Information Administration

MERCURY & AIR TOXICS STANDARDS IMPLEMENTATION

Final Rule 77 FR 9304 (February 16, 2012)

Startup, Shutdown Reconsideration 79 FR 68777 (November 19, 2014)

Technical Corrections – Prepublication (December 19, 2014)

Mercury & Air Toxics Standards (MATS) Implementation

Regional Implementation Activities

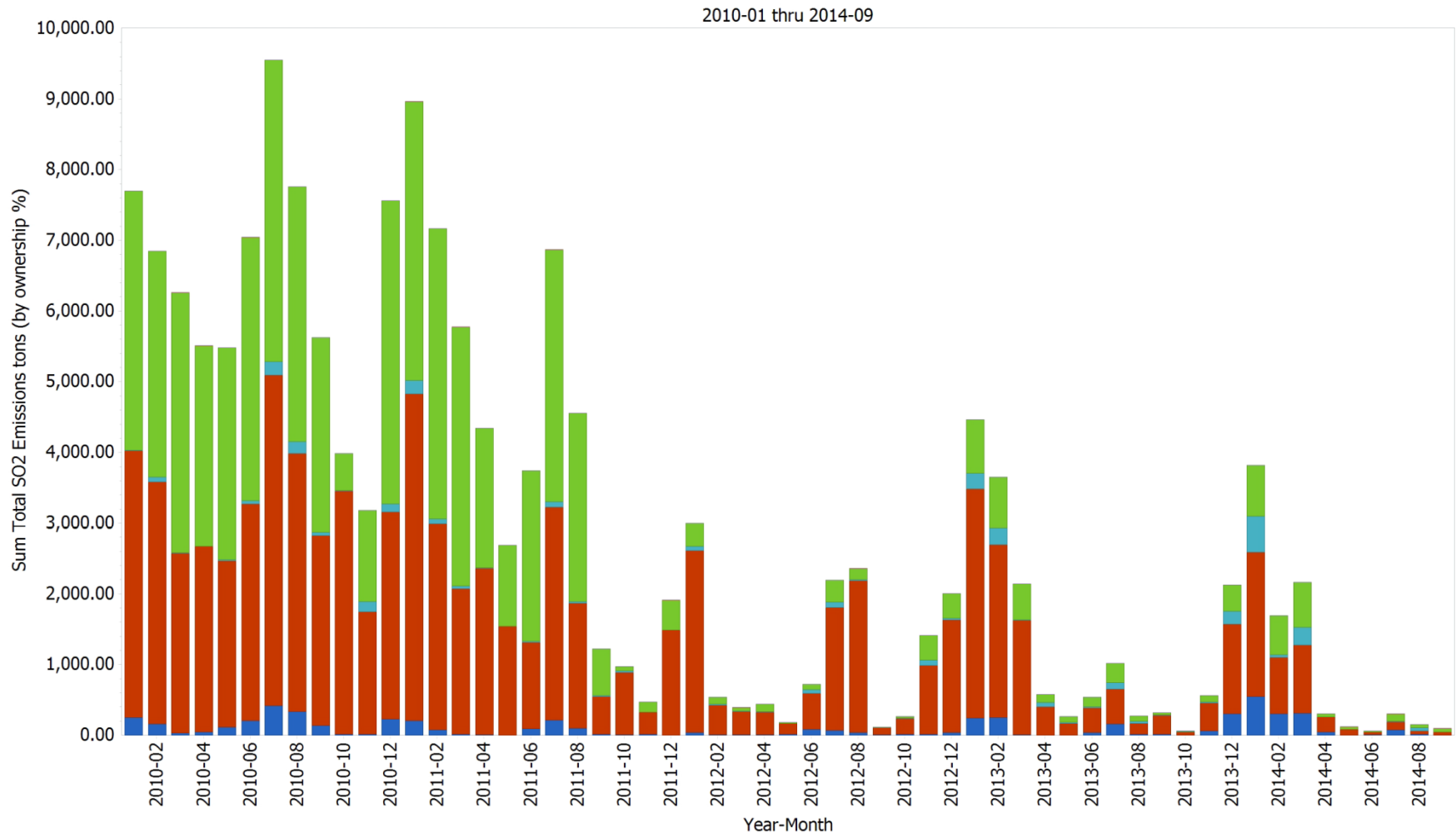
- **April 16, 2015 Compliance Deadline:** affected coal- and oil-fired generators throughout the region appear already or preparing to comply with applicable emission limits and reporting requirements
- **December 17, 2014:** deadline for submitting MATS compliance extension requests (120 days before April 2015)

EPA Proposes Minor Revisions & Corrections to 2012 MATS

- **December 19, 2014:** EPA proposed technical revisions and corrections to compliance, monitoring and reporting requirements
 - Corrections would harmonize conflicting definitions and applicability tests in different MATS provisions
 - Removes **affirmative defense** clause shielding generators from civil penalties for MATS violations due to equipment malfunctions

Source: [EPA Proposed MATS Corrections](#), Prepublication Rule (December 19, 2014)

New England RGGI Sources SO₂ Emissions By State (2010-2014)



Source: Ventyx Velocity Suite

CT MA ME NH RI VT

Most Coal-fired Steam Units Already Retrofit with MATS controls

Mount Tom Station

Unit 1: 143 MW (coal)
Activated carbon injection (Hg)
Spray dry absorber & fabric filter baghouse (acid gases)
(Deactivated)

Bridgeport Harbor

Unit 3: 383 MW (coal)
Activated carbon injection (Hg)
Fabric filter baghouse (acid gases)

Merrimack Station

Unit 1: 112.5 MW (coal)
Unit 2: 338 MW (coal)
Activated carbon injection (Hg)
Wet Scrubber (acid gases)

Schiller Station

Unit 4: 48 MW (coal)
Unit 6: 48 MW (coal)
Extension request until April 2016 to add controls **(Out for public comment)**

Brayton Point Station

Unit 1: 243 MW (coal)
Unit 2: 244 MW (coal)
Unit 3: 612 MW (coal)
Activated carbon injection (Hg)
Spray dry absorber & fabric filter baghouse (acid gases)



Sources: EPA, NH DES, EIA, Ventyx Velocity Suite

REGIONAL AIR QUALITY ISSUES

Ozone National Ambient Air Quality Standard Update

Proposed Rule 79 FR 75233 (December 17, 2014)

EPA Proposing Lower Ozone Standard

Final Action due by October 2015

Revised Ozone Standard Under Interagency Review

- **December 17, 2014:** EPA proposes more stringent ozone standard:
 - Current standard 75 parts per billion (ppb)
 - Proposed range 60-70 ppb (eight (8) hour average)
 - <https://federalregister.gov/a/2014-28674>

Ozone Season (March-September) Extended in 2017

- Ozone season will be extended by one (1) month (March – September) in 33 States:
 - Including Connecticut, Massachusetts, New Hampshire, and Rhode Island
 - Operational restrictions

EPA Proposing Lower Ozone Standard (cont.)

Differing permitting requirements

Proposed Changes to Permitting Sources During Phase-in

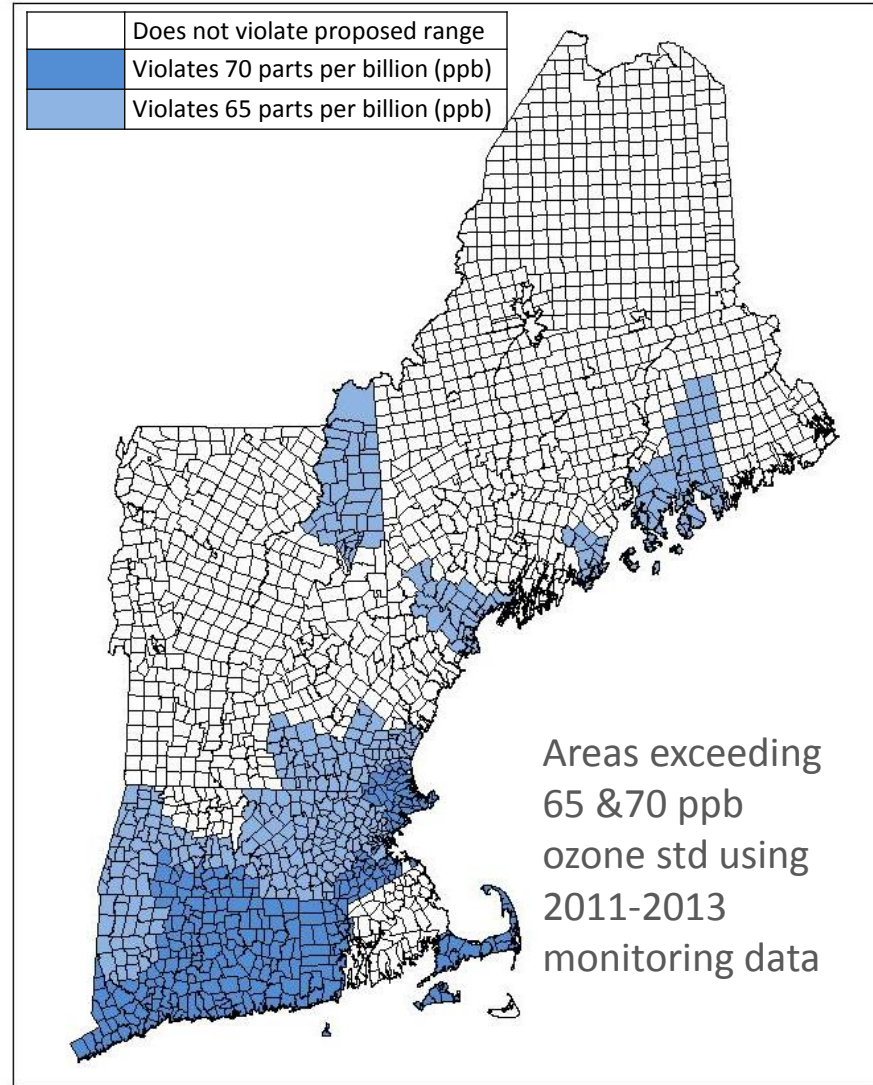
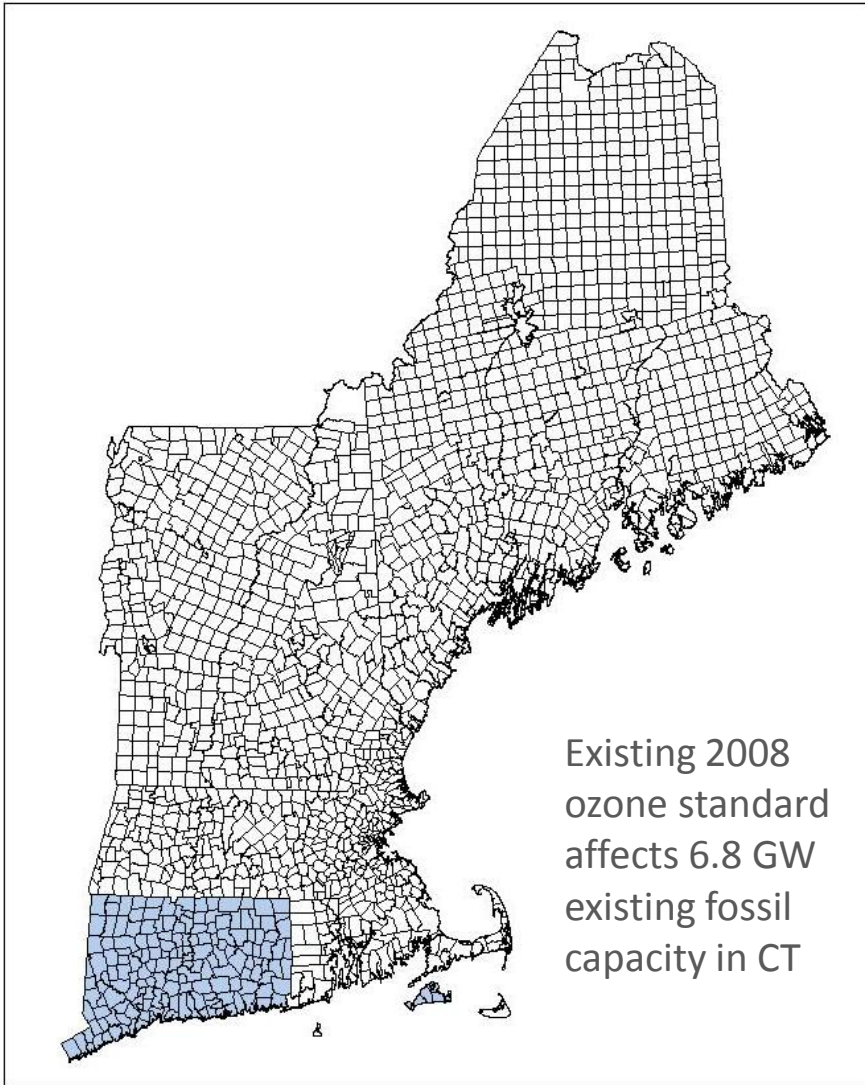
- **Grandfathering pending projects:** EPA is proposing to apply existing 2008 ozone standard requirements to any in-the-pipeline permit applications that meet certain conditions, rather than the expected 2015 ozone standard requirements
- Eligible projects are those meeting certain milestones by October 2015

Overview of Ozone Standard Changes

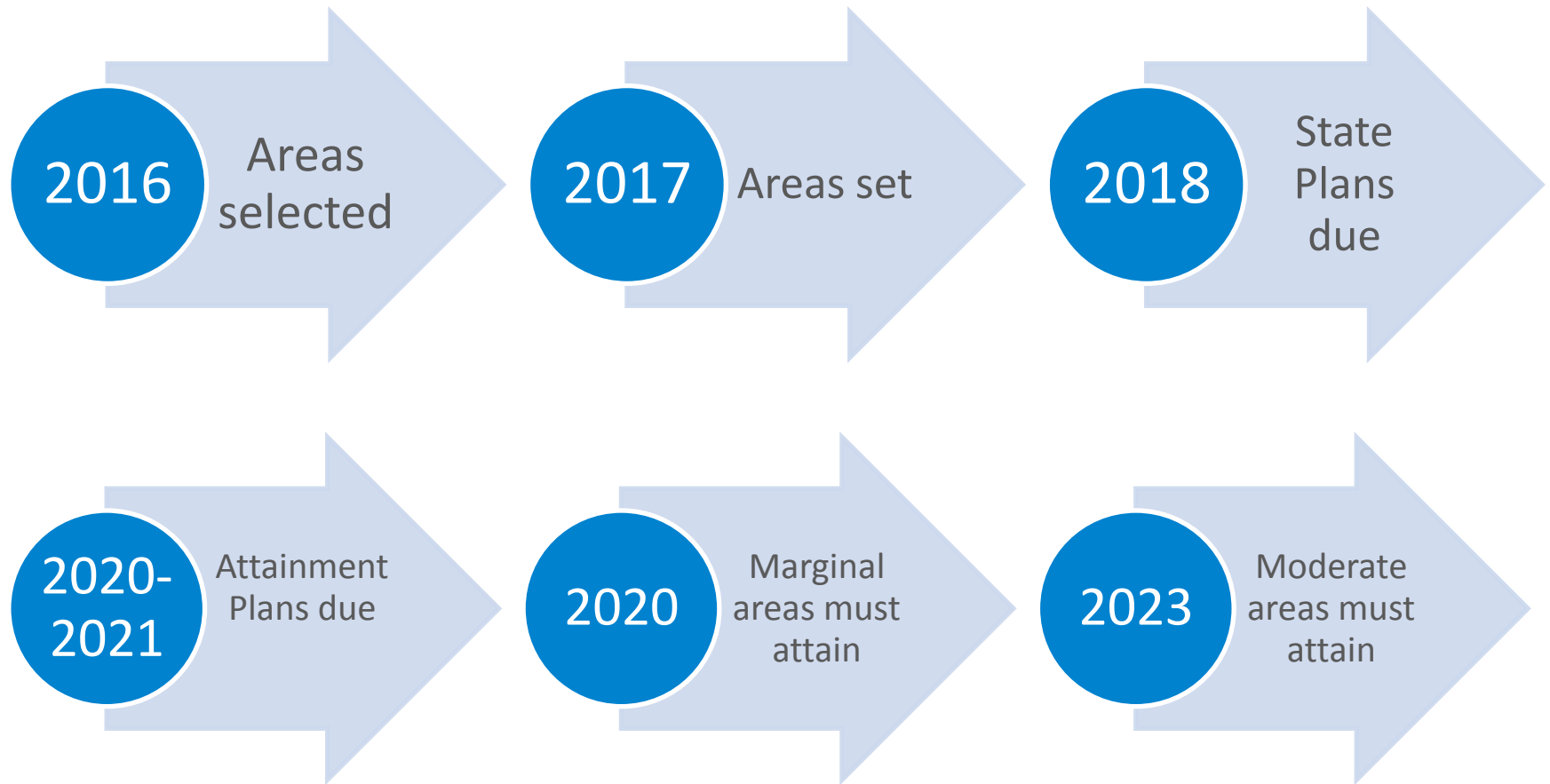
- Prevention of Significant Deterioration (PSD) applications would be grandfathered if:
 - Permitting agency (State or EPA) has formally determined the applications is to be complete on or before the signature date of 2015 standard (expected October 2015), or
 - Public notice for a draft permit or preliminary determination has been published prior to the effective of the 2015 standard

Potential 2015 Ozone Nonattainment Areas

Larger part of Region, More Generators Affected



Tentative Schedule for Area Designations and Corrective Measures



Source: EPA

COOLING WATER INTAKE STRUCTURES 316(B) RULE

Final Rule 79 FR 48299 (August 15, 2014)

Effective October 14, 2014

Cooling Water Intake Structure 316(b) Rule Implementation Involves Species Protection

Final Rule Requires Use of Best Technology Available

- **October 14, 2014:** Final Rule effective, requires existing facilities with cooling water intake structures to evaluate:
 - Impingement mortality standards
 - Entrainment mortality standards
 - Additional measures for protection of threatened or endangered species

316(b) Requires Protection of Threatened or Endangered Species

- EPA will use “the full extent of its [Clean Water Act] authority to object to a State [] permit where EPA finds [] that a State [] permit is likely to *jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat.*” 79 FR 48383

Source: NOAA Fisheries Greater Atlantic Region



Regional Cooling Water 316(b) Rule Impacts

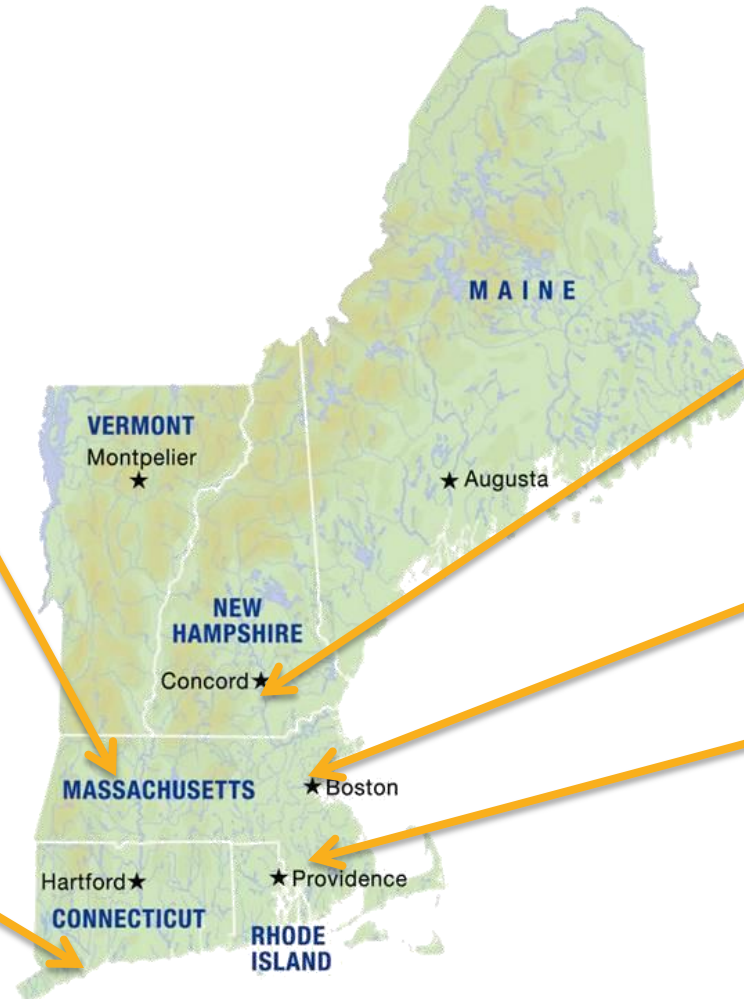
Requires technology retrofits & changes in Operations

Mount Tom Station

Unit 1: 143 MW (coal)
Proposed NPDES permit curtails operation in May-June to minimize impact on fish spawning requires installation of fish exclusion screen on water intake **(deactivated)**

Millstone Point Station

Unit 2 : 872 MW (nuclear)
Unit 3: 1,225 MW (nuclear)
Existing NPDES permit required variable frequency drives or pumps and curtails cooling water usage by 40% during winter flounder spawning season (April-May)



Merrimack Station

Unit 1: 112.5 MW (coal)
Unit 2: 338 MW (coal)
Proposed NPDES permit requires installation of closed cycle cooling system **(pending)**

Kendall Station

Unit 4: 154 MW (natural gas)
NPDES permit eliminates once through cooling. Installing back pressure steam generator and air condensers to convert thermal pollution into useful steam

Brayton Point Station

Unit 1: 243 MW (coal)
Unit 2: 244 MW (coal)
Unit 3: 612 MW (coal)
Unit 4: 435 MW (oil)
NPDES permit required conversion to closed cycle cooling system (natural draft cooling towers)

Source: [EPA Region I](#); facility NPDES permits

Cooling Water Intake 316(b) Rule Coordination With Endangered Species Act (ESA)

EPA Must Ensure No Adverse Impacts on Species or Habitat

- Under the May 2014 Final Rule several provisions require actions to address threatened and endangered species and designated critical habitat
- Requires Fish & Wildlife Service and National Marine Fisheries Service (Services) to review ESA related elements of proposed individual Clean Water Act NPDES permits

Services Will Review Individual Generator NPDES Permits

- Regulators (States & EPA) are required to: “exercise its oversight authority on proposed/draft permits where the Services contact EPA with concerns that a State or Tribal permit *will have more than minor detrimental effects on Federally-listed species or designated critical habitat*”

EPA CLEAN POWER PLAN

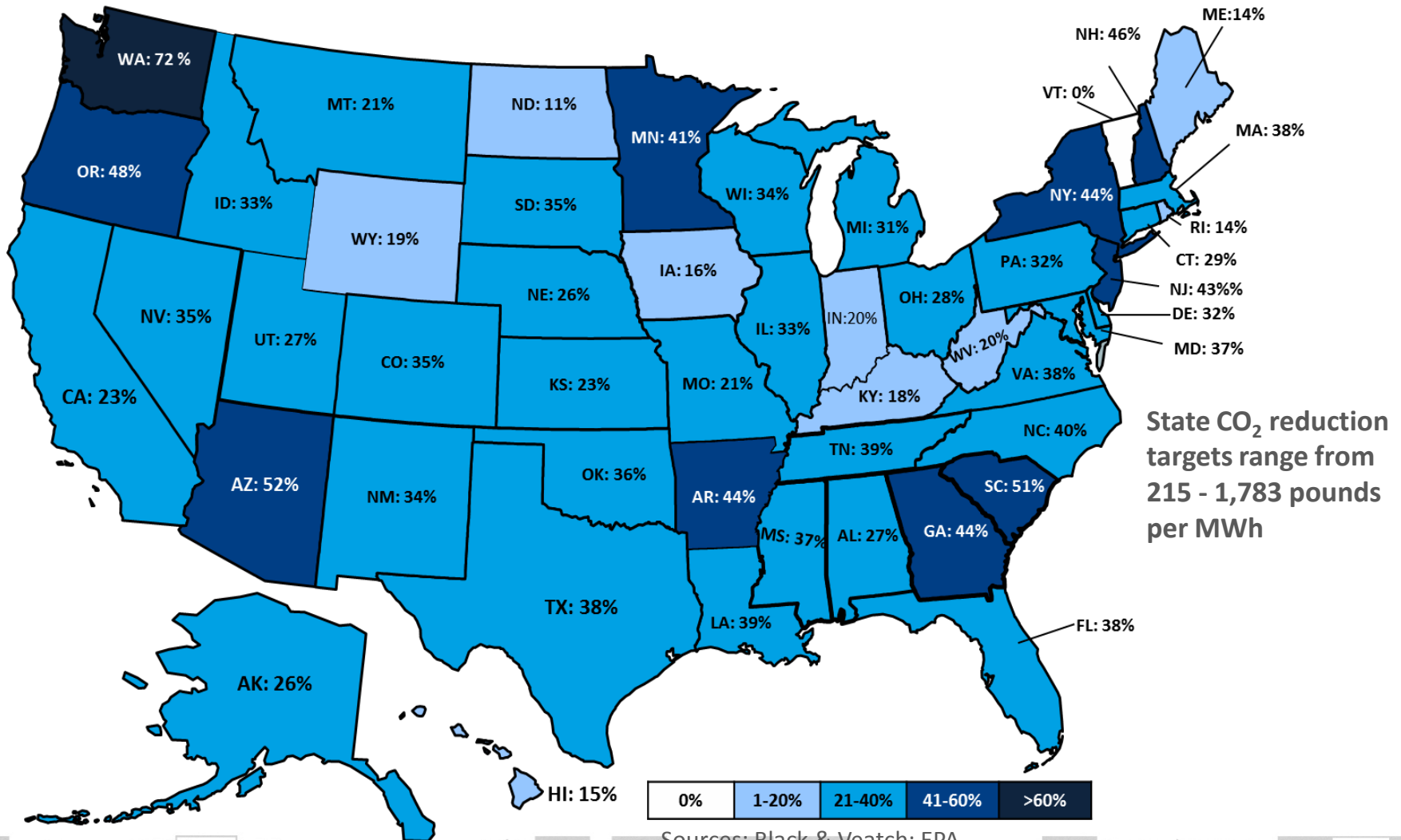
Proposed Rule 79 FR 34830 (June 18, 2014)

*Notice of Data Availability – Rate Conversion 79 FR67406
(November 13, 2014)*

Notice of Data Availability 79 FR 64543 (October 30, 2014)

Regulatory Docket EPA-HQ-OAR-2013-0602

Proposed Clean Power Plan CO₂ Emission Rate State Reduction Targets

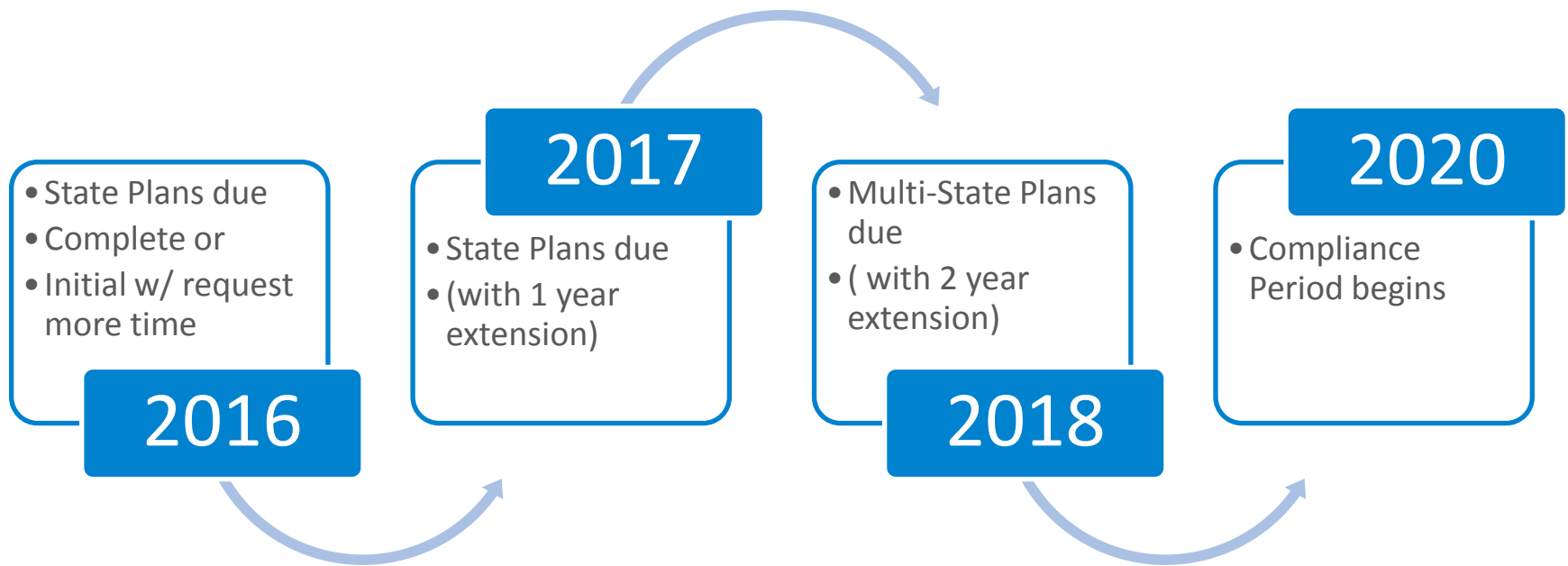


Clean Power Plan Adjustments In Rulemaking Schedule (December 2014)

- **January 7, 2015:** EPA announces adjustments in rulemaking schedule, both 111(d) & 111(b) final rules due during Summer 2015
 - Clean Power Plan for existing generators in States, Indian Country and U.S. Territories
 - Carbon Pollution Standards for new, modified and reconstructed generators
 - Federal plan requirements for meeting Clean Power Plan



Clean Power Plan State Plan Development Schedule



EPA Illustrated Methods for Rate To Mass Based CO₂ Conversions for State Targets

- **November 13, 2014:** EPA issues methodology for converting emission rate-based State CO₂ targets to equivalent mass-based targets
 - [79 FR 67406](#)
- Offers examples for calculating the mass limits for states considering multi-state trading programs as a 111(d) compliance option
- EPA suggests two conversion methods:
 - Option 1: using historical data, produces mass-based equivalent metrics that apply to existing affected EGUs only
 - Excludes new fossil fuel-fired sources
 - Option 2: using both historical data and projected future electric demand, produces mass-based equivalent metrics
 - Includes new fossil fuel-fired sources, since proposed CPP sought comment on the including new, fossil fuel-fired sources as a component of state plans

Clean Power Plan Notice of Data Availability

79 FR 64543

EPA Evaluating Opportunities for Shifting Certain CPP Elements

- **October 30, 2014:** EPA summarizes issues raised by multiple stakeholders, seeking comment on three topics that may go beyond June 18, 2014 proposal:
- Interim Goals (2020-2029) Emission Reduction Compliance Trajectory (Glide Path)
 - Potential credit for early reductions (<2020)
 - Phasing in building block 2 (increased NGCC utilization)
- Certain aspects of the building block methodology
 - Stringency of building block 2
 - Methodology for building block 3 and how building block 3 targets relate to compliance options –
- Methodology for state - specific CO₂ goal calculations
 - Goal - setting equation
 - Alternatives to the 2012 data year

FERC Technical Conference on EPA's Clean Power Plan

- **December 9, 2014:** FERC announced a series of technical conferences to consider the reliability implications of various compliance approaches to EPA's proposed Clean Power Plan:
 - February 19, 2015 - National Overview (Washington, DC)
 - March 11, 2015 - Eastern Region (Washington, DC)
- Whether regulators and industry have the appropriate tools to identify reliability and/or market conditions that may arise
- Potential strategies for complying with the EPA regulations and coordinating with FERC-jurisdictional wholesale and interstate markets
- How planning entities, industry and states coordinate reliability and infrastructure planning processes with environmental compliance efforts to ensure the adequate development of new infrastructure and to manage any potential reliability and operational impacts for proposed compliance plans

MASSACHUSETTS CLEAN ENERGY STANDARD

Massachusetts Proposes Clean Energy Standard

Seeks Increasing “Clean Energy” Sales to Further 2020 Climate Plan

- **December 2014:** Massachusetts proposes a Clean Energy Standard,” specifying percentage of electricity sales in state come from sources with have “clean energy attributes:”
 - **2020:** 45% of electricity sales
 - **2024:** increase to 49% of electricity sales
- **Post 2024:** State would need to develop 10 year schedule of percentage reductions going forward

Proposed Qualifying “Clean Energy Resources”

- Includes two (2) options for qualifying energy sources:
 - Generators that are RPS Class I renewable units
 - Generators demonstrating lifecycle GHG emissions <50% below the lifecycle emissions of an advanced combined cycle generator
- DEP specifies CES requirements are consistent with 2020 Massachusetts Clean Energy and Climate Plan

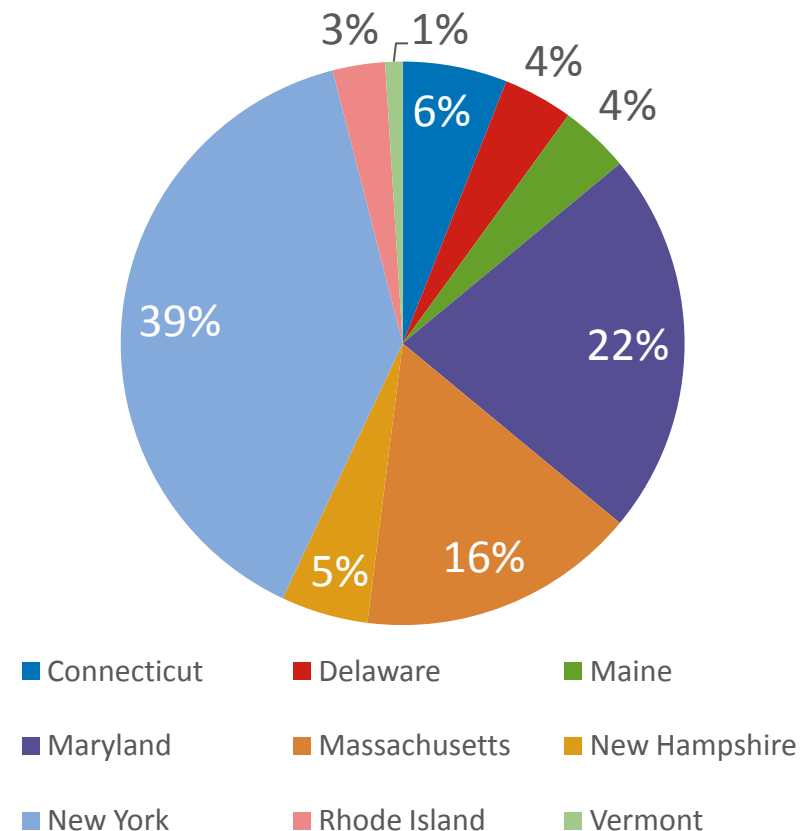
REGIONAL GREENHOUSE GAS INITIATIVE

RGGI Program Overview

Program Overview, Allocations & Compliance Schedule

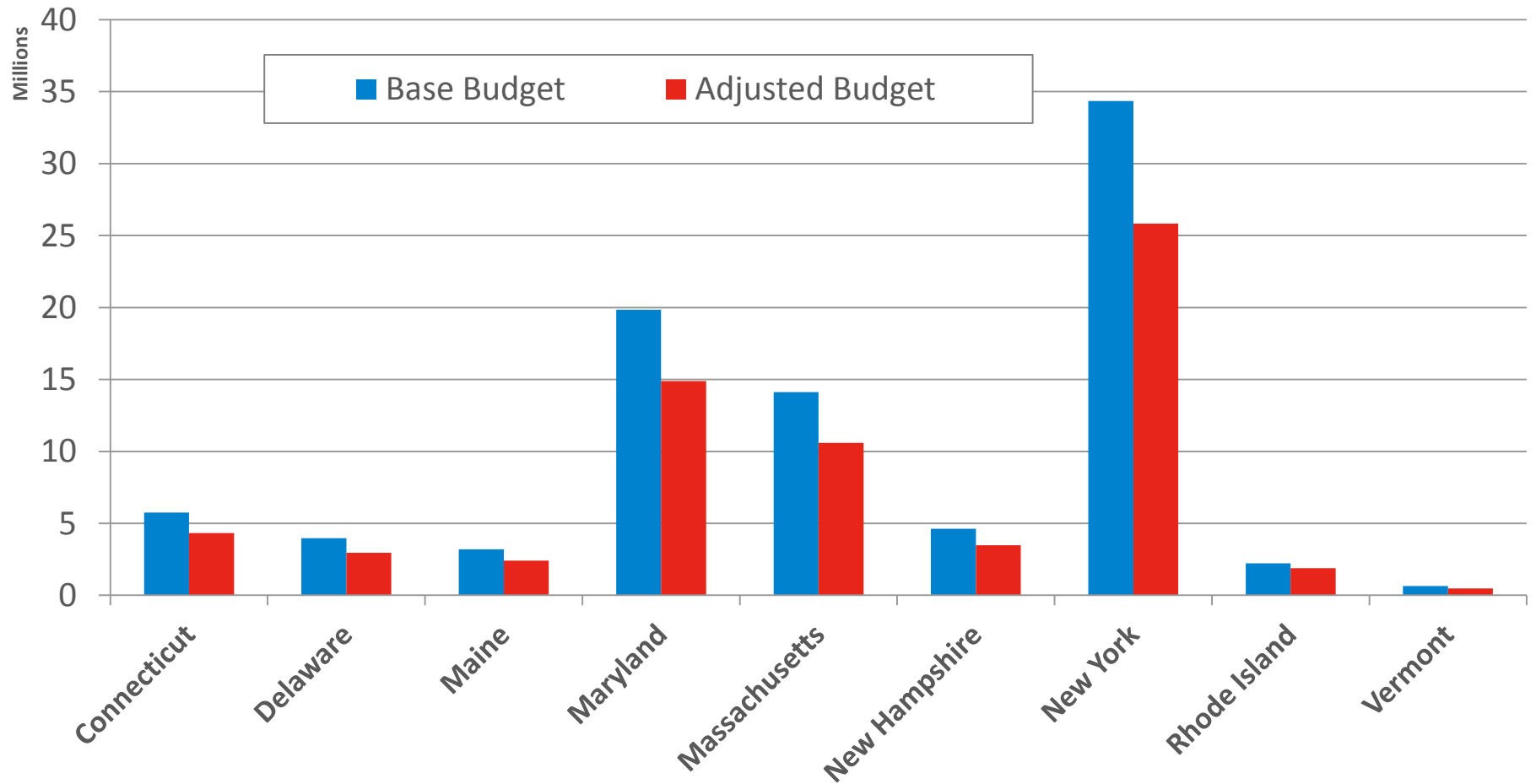
- **88.7** million short tons - RGGI 2015 cap (2014 cap was 91 M)
 - New England share **30.6** M
- **66.8** million short tons - Adjusted RGGI cap
 - New England share **23.1** M
- **March 2, 2015:** deadline for ended control period CO₂ allowances surrender and certification of compliance
 - Affected RGGI sources must have acquired allowances equal to prior three (3) year control period
 - States audit compliance reports

RGGI 2015 CO₂ Allowance Allocation (State %)



Source: RGGI

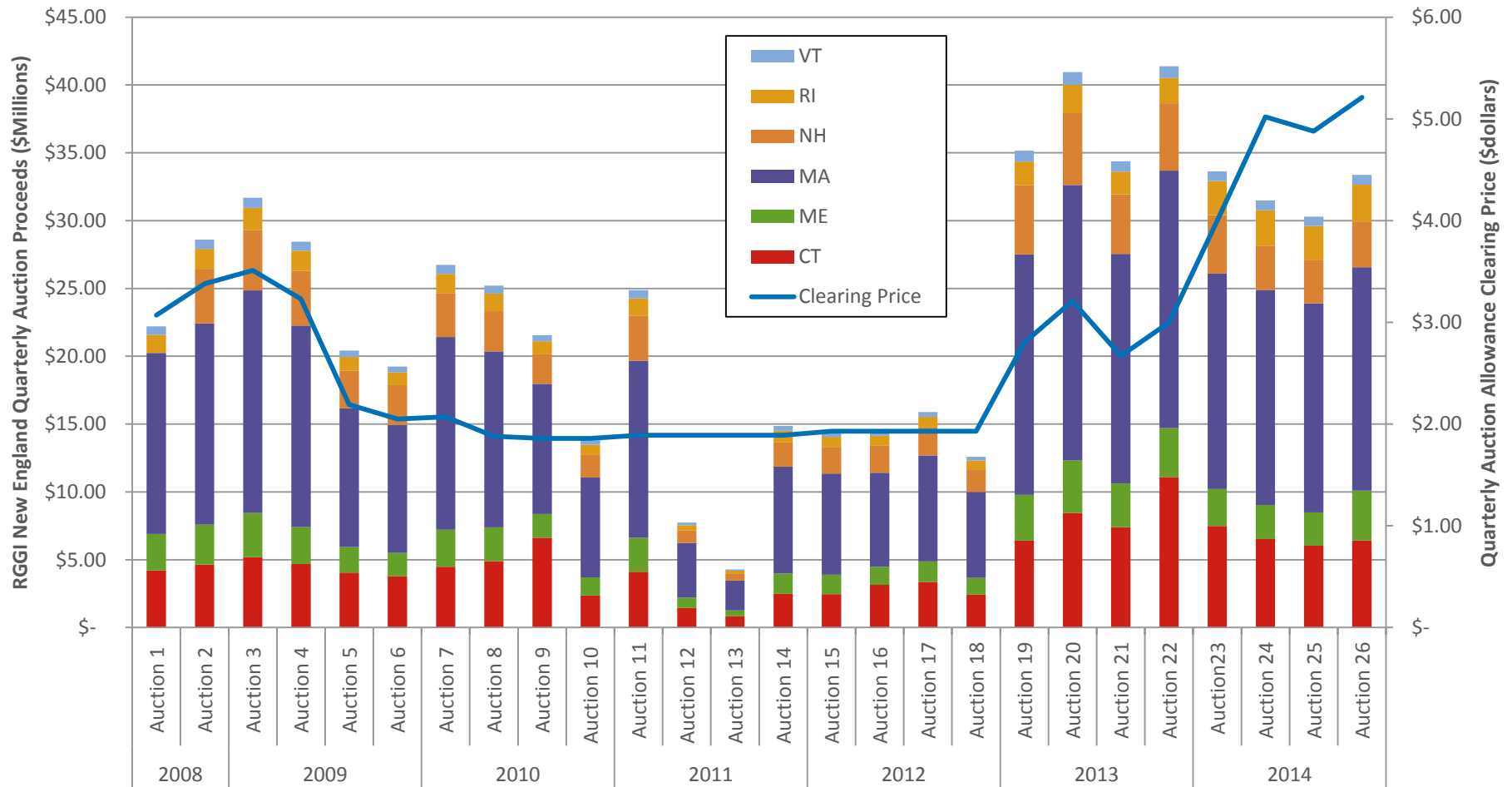
RGGI 2015 CO₂ Allowance Allocation



Source: RGGI

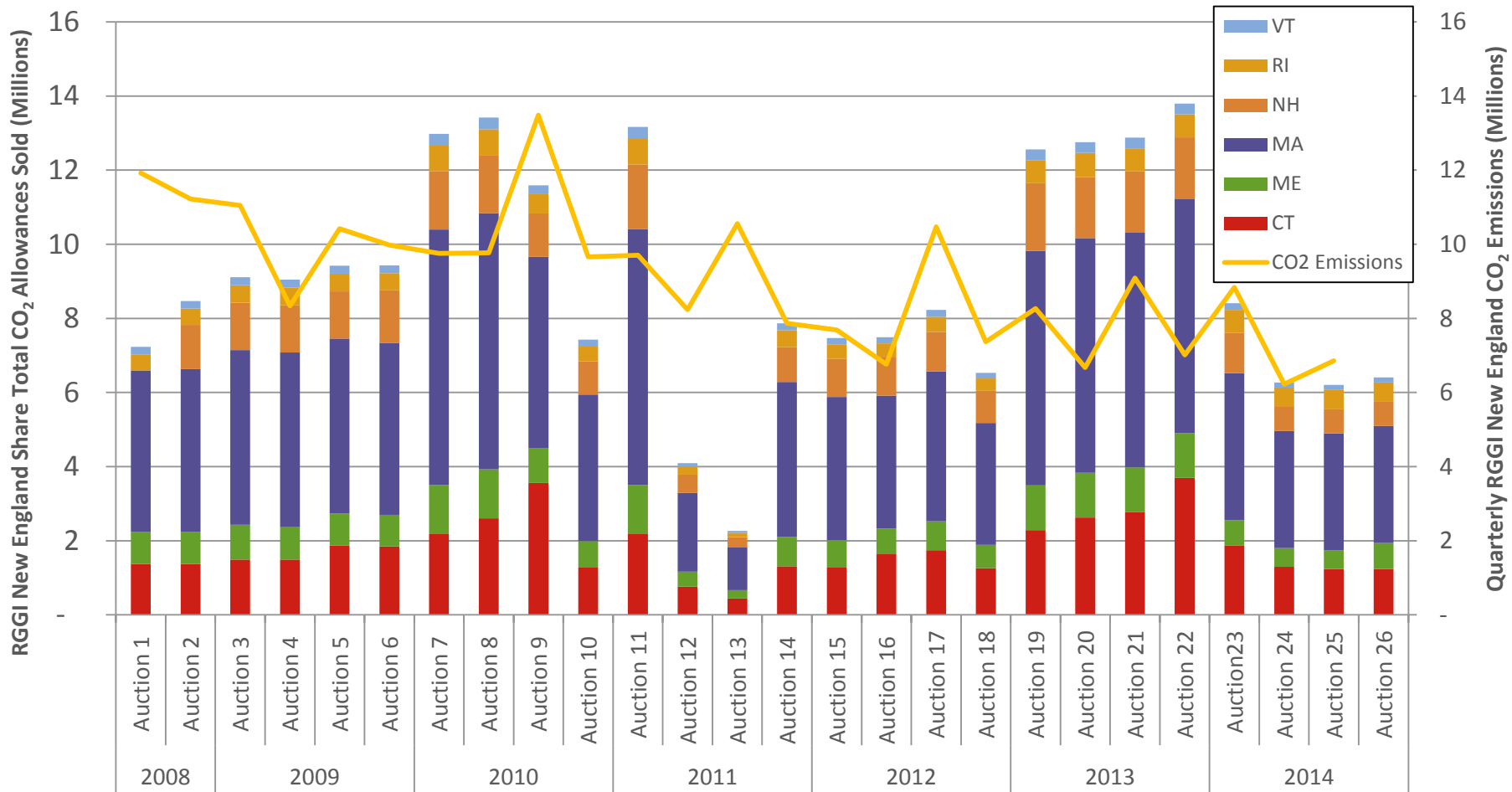
RGGI New England Region: CO₂ Auctions

Regional Proceeds & Clearing Price



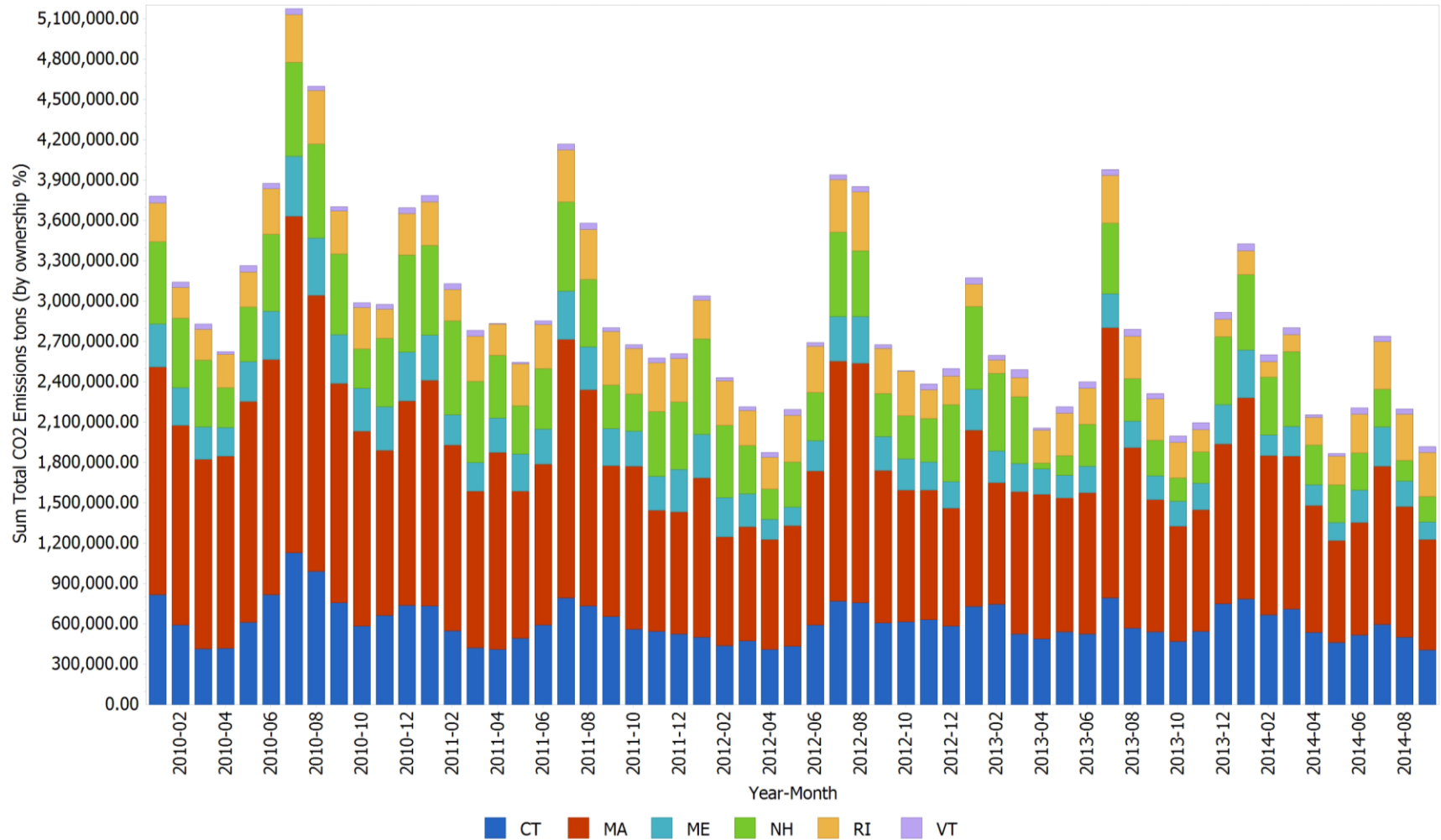
Source: RGGI

RGGI New England Region: CO₂ Allowances Sold & Emissions (2008-3Q – 2014-3Q)



Sources: RGGI; EPA

New England Electric Generator CO₂ Emissions (2010-2014)



Source: Ventyx Velocity Suite

Questions

