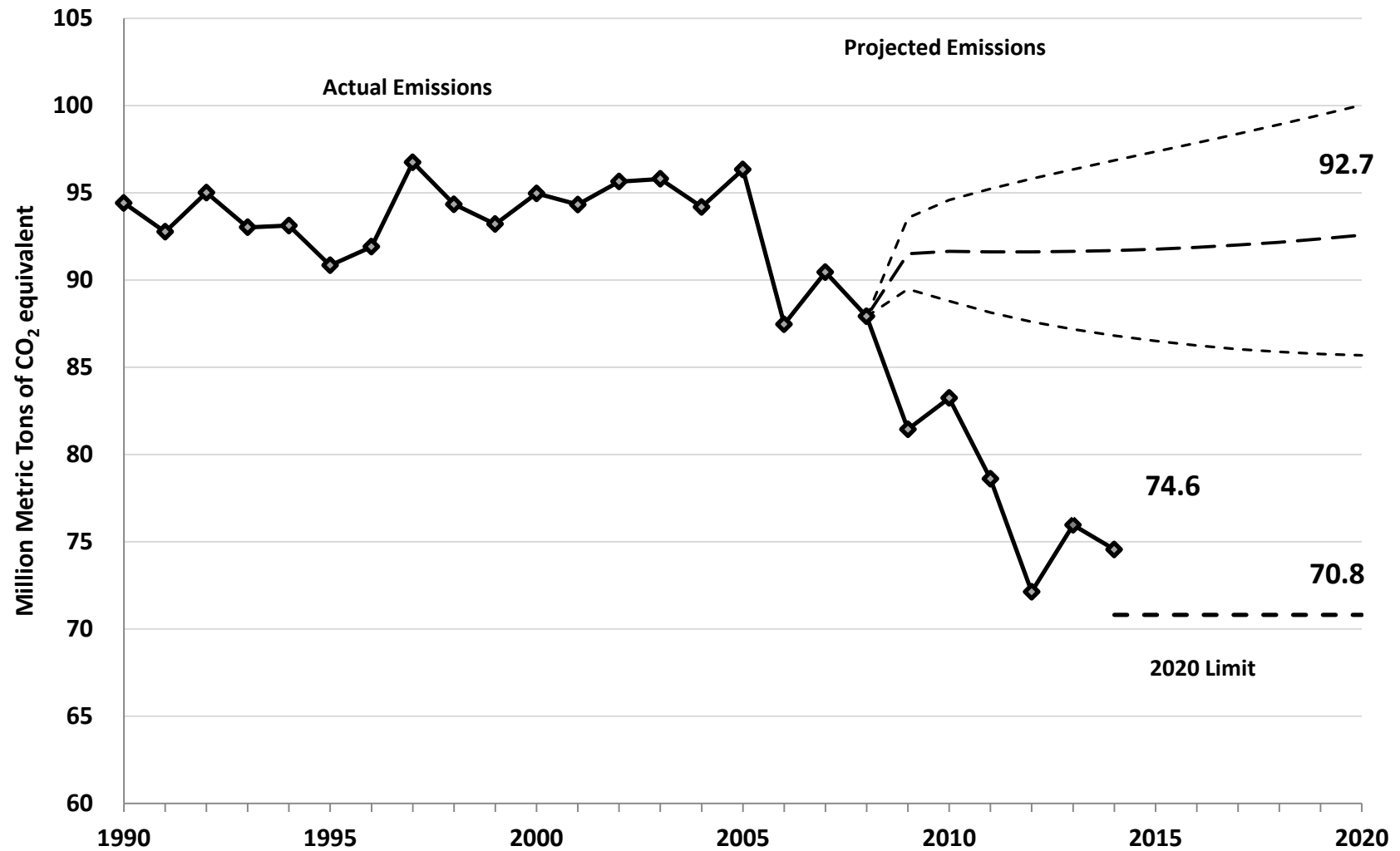
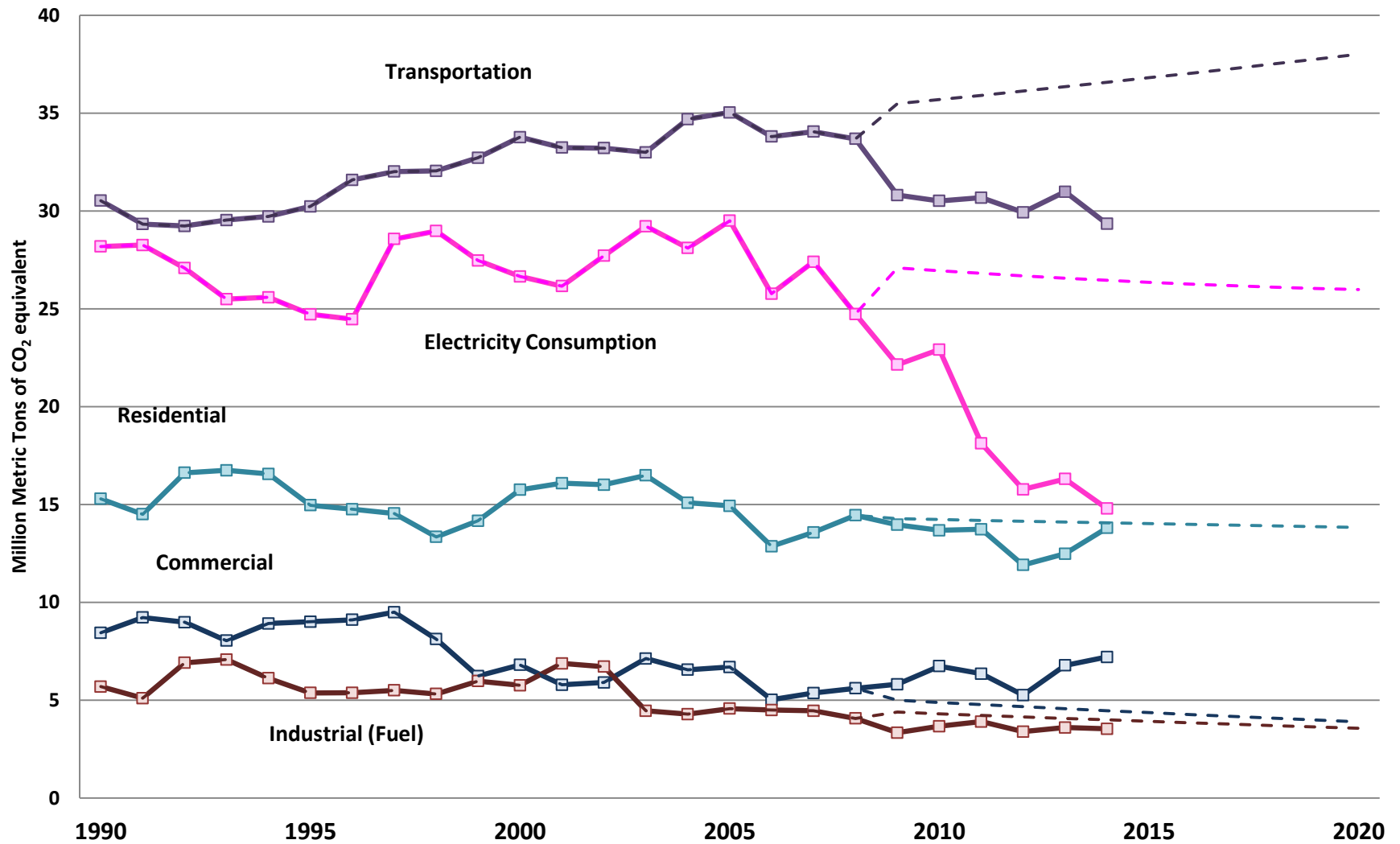


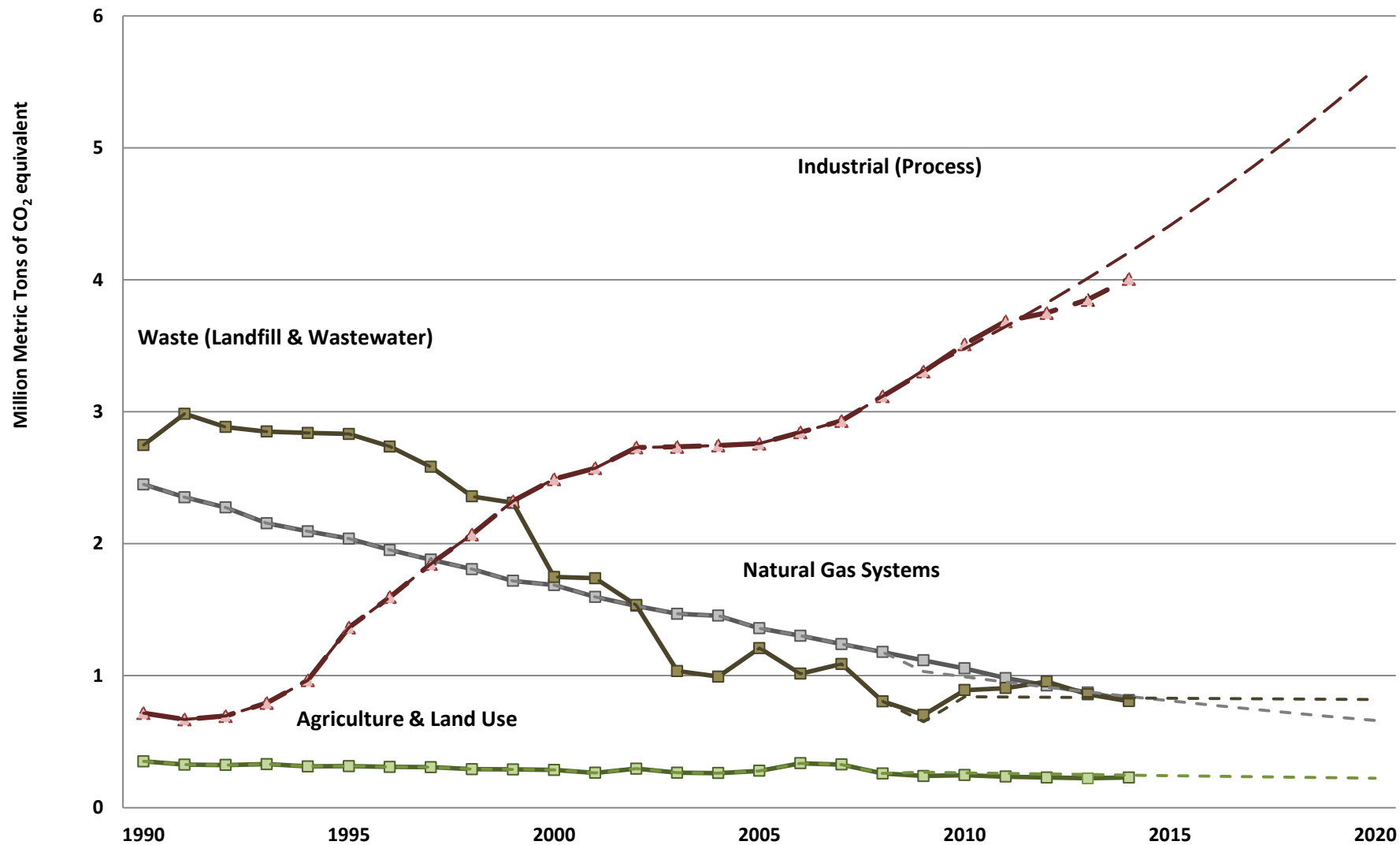
Massachusetts GHG Emissions



Massachusetts GHG Emissions from Fuel Combustion (by Sector)



Massachusetts GHG Non-Fuel Combustion Emissions (by Sector)



SIP Steering Committee

May 23, 2017



SIP Update

SIP Steering Committee
May 23, 2017



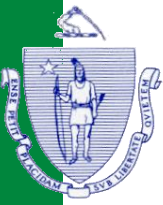
Planned SIP Revisions

- Ozone Transport SIP for 2008 NAAQS
- SO₂ Transport SIP for 2010 NAAQS
- PM_{2.5} Infrastructure SIP for 2012 Annual NAAQS (including transport)
- 2011 Emissions Inventory
- CO Maintenance Plans
- Regional Haze Progress Report



Infrastructure SIPs

- New NAAQS trigger review of SIP adequacy under CAA 110(a)(1) and (2)
- iSIPs document adequacy of existing programs to implement the new NAAQS
- iSIPS must address transport under 110(a)(2)(D)(i) – “Good Neighbor SIP”
- In 2014 MassDEP submitted iSIPs for ozone, NO₂, and SO₂ – EPA approved



Ozone Transport SIP

- 2014 iSIP did not address transport due to CSAPR litigation
- In 2015 EPA published Guidance with modeling of contributions for 2017
- Used screening threshold = 1% of NAAQS



Ozone Transport SIP

- EPA modeling shows MA's max contribution to any monitor with nonattainment or maintenance issues in 2017
 - New Haven, CT – nonattainment
MA contributes 0.13% of NAAQS
 - Ocean, NJ – maintenance
MA contributes 0.49% of NAAQS
- Both < 1% of NAAQS



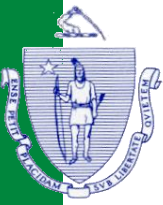
SO2 Transport SIP

- All nearby areas attain the standard
- Retirements and conversions reduced SO2 sources
- No 100 ton sources near borders
- Low-S fuel contributing to decrease now and in future
- Design values are falling in MA and nearby states
- Therefore MA emissions will not pose a problem in the future



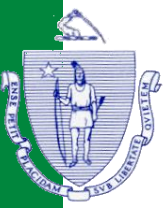
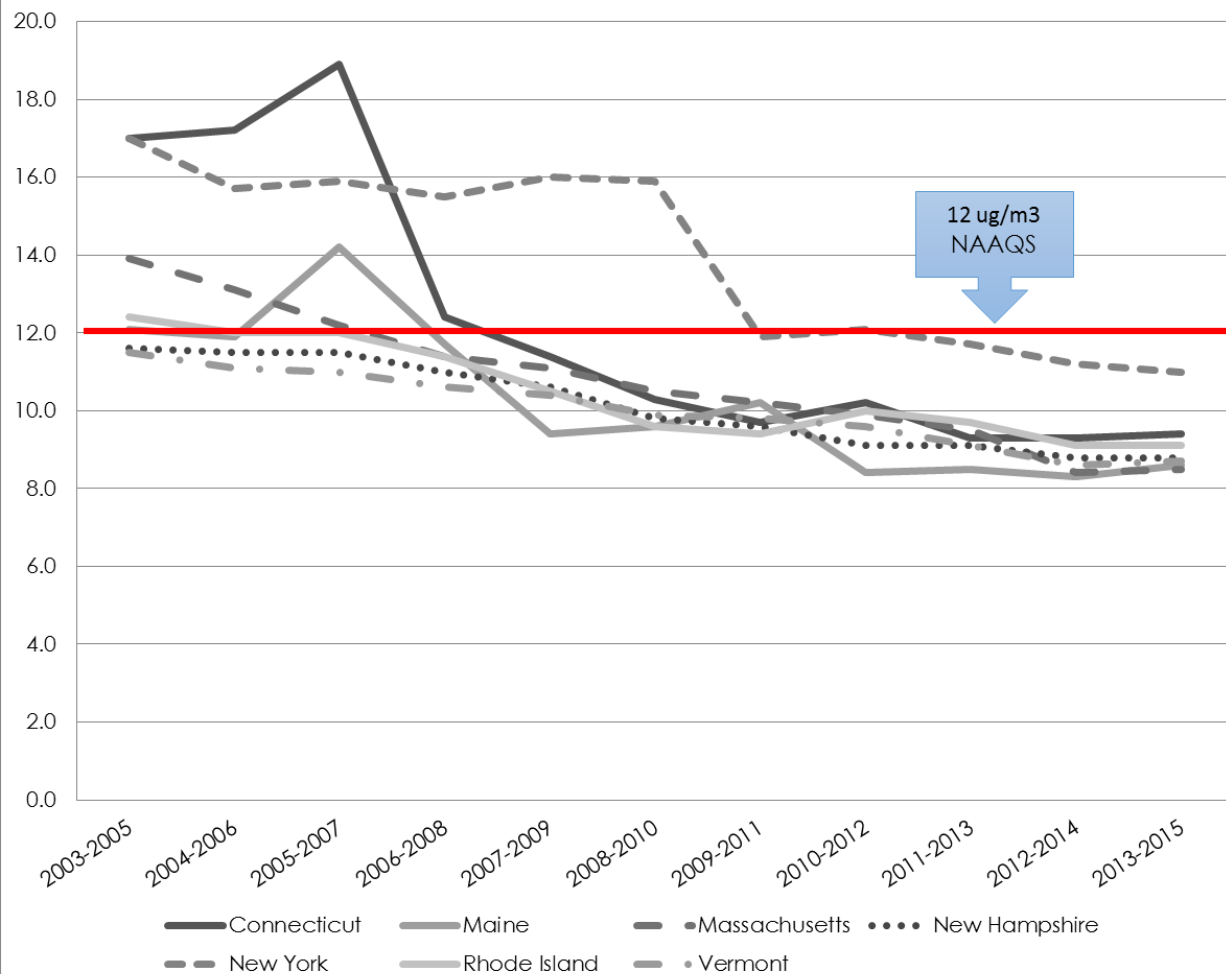
PM 2.5 Infrastructure SIP

- Use weight of evidence approach to address transport elements
- MA attains PM2.5 NAAQS and no adjacent states in nonattainment
- Closest nonattainment in PA, but projected to attain in 2017 and 2025 (EPA modeling)
- PM2.5 emissions declining
- Therefore MA emissions should not pose a problem in the future



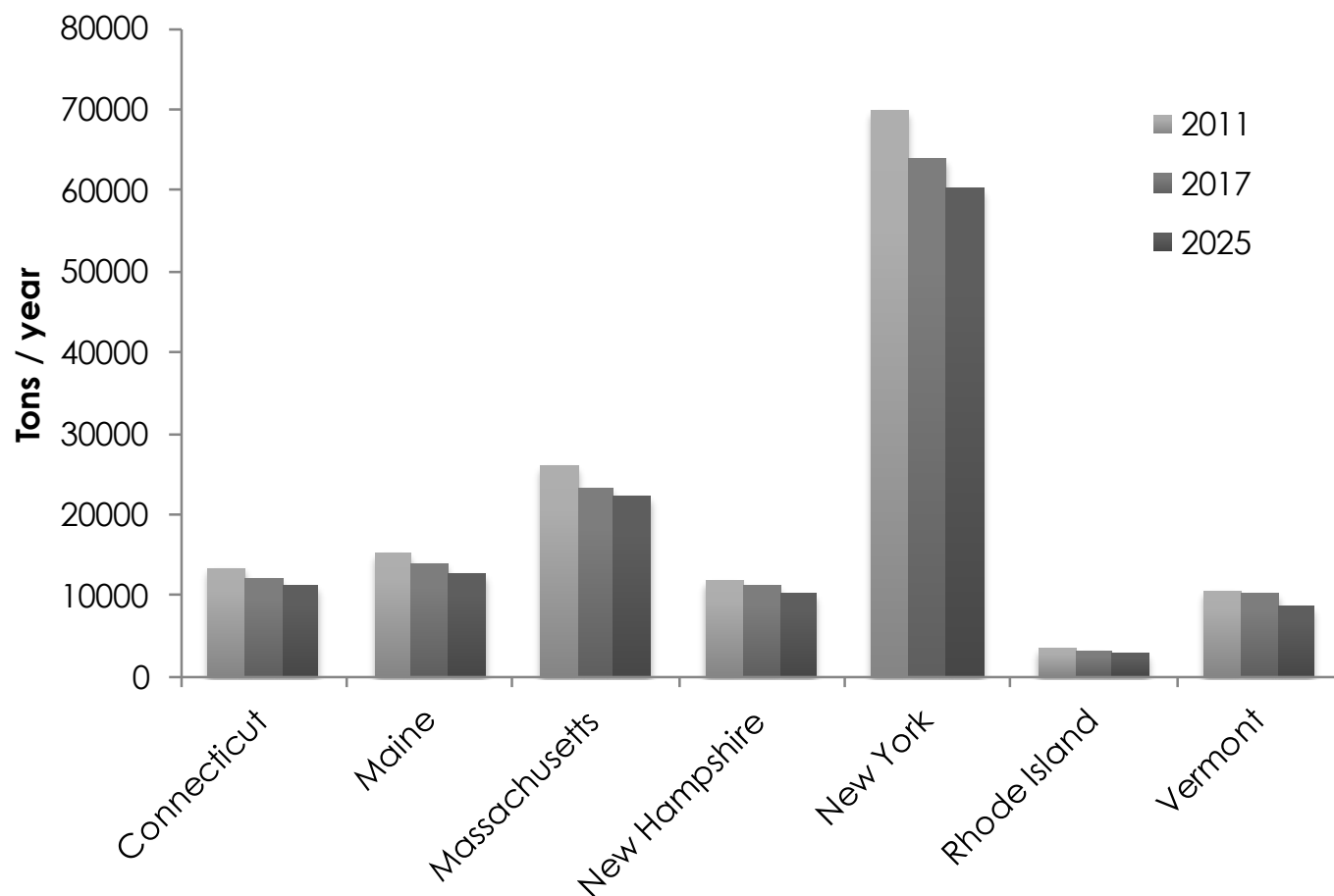
PM2.5 in Nearby States

Figure 3: Maximum PM2.5 Design Value Trends
Annual Standard (12 ug/m3)



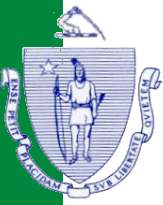
Emissions in Nearby States

Figure 5: PM_{2.5} Emissions Projections
2011 - 2025



CO Maintenance Plans

- Carbon Monoxide 2nd 10-year Maintenance Plans
- Last exceedance 1987
- CO levels less than 25% of NAAQS and continue to decline
- Emissions reductions of 61% (1999-2011)
- Monitors discontinued in Lowell and Springfield; moved CO monitoring in Boston from Kenmore to Von Hillern



Massachusetts Emissions Inventory

2002-2014 and EPA Projected 2018

Ozone and Regional Haze Pollutants

VOC, NOX, SO₂ and PM_{2.5}



SIP Steering Committee

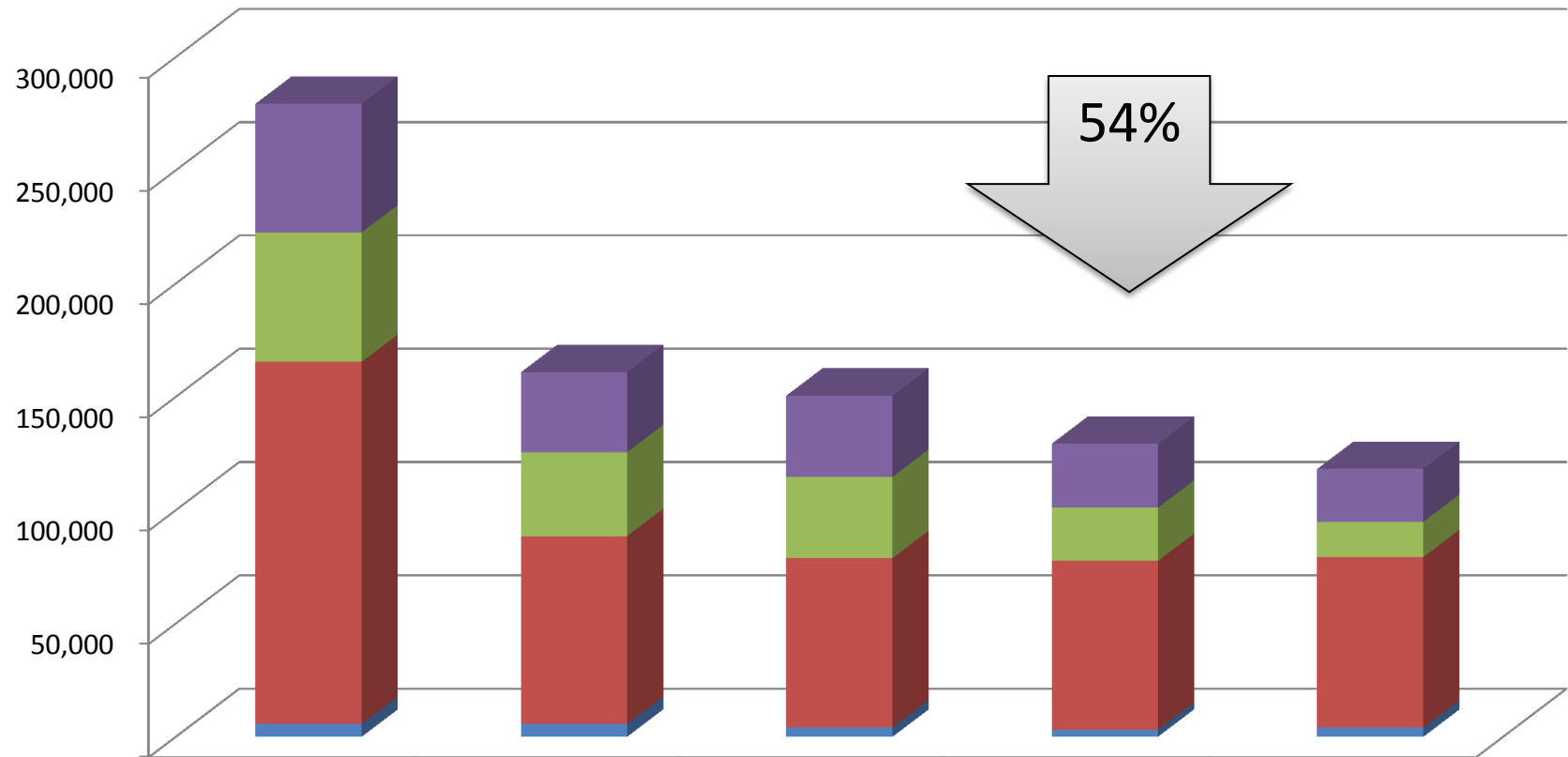
May 23, 2017

Emissions Inventory

- National Emissions Inventory every 3 years
- Part of SIP for nonattainment areas (e.g., 2011)
- Foundation for modeling of future attainment and interstate transport
- Used in other SIPs - RFP budgets, maintenance plans, attainment demonstrations, regional haze
- Produced from many different models and emissions reporting
- Refined over time through regional and national collaboration

VOC

2002-2014 and EPA 2018 Projections (tons/year)

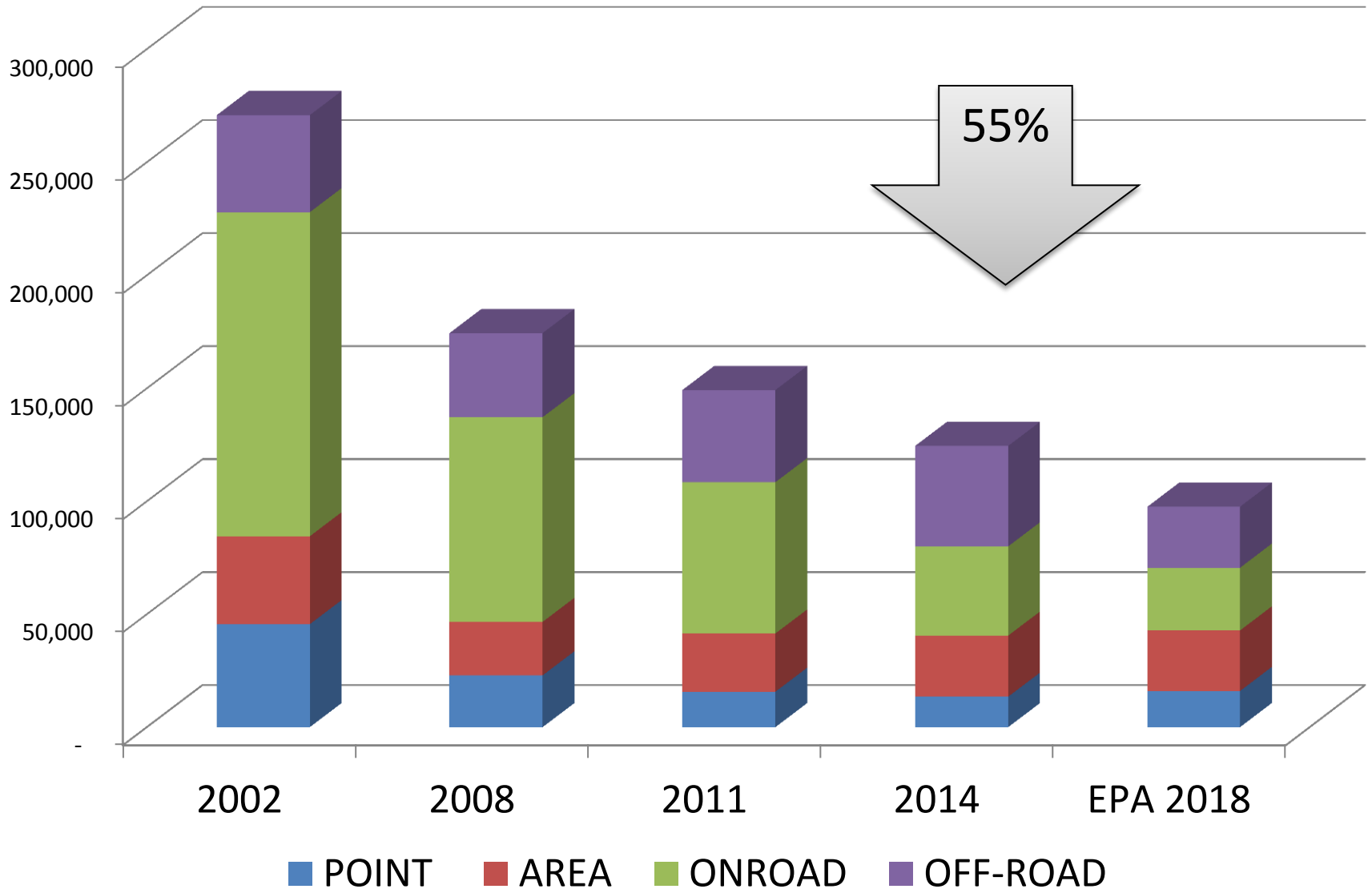


	2002	2008	2011	2014	EPA 2018
OFF-ROAD	56,777	35,232	35,856	28,219	23,303
ONROAD	57,186	37,024	35,866	23,489	15,595
AREA	159,753	82,967	74,662	74,417	75,265
POINT	5,647	5,587	4,119	3,151	4,006

POINT AREA ONROAD OFF-ROAD

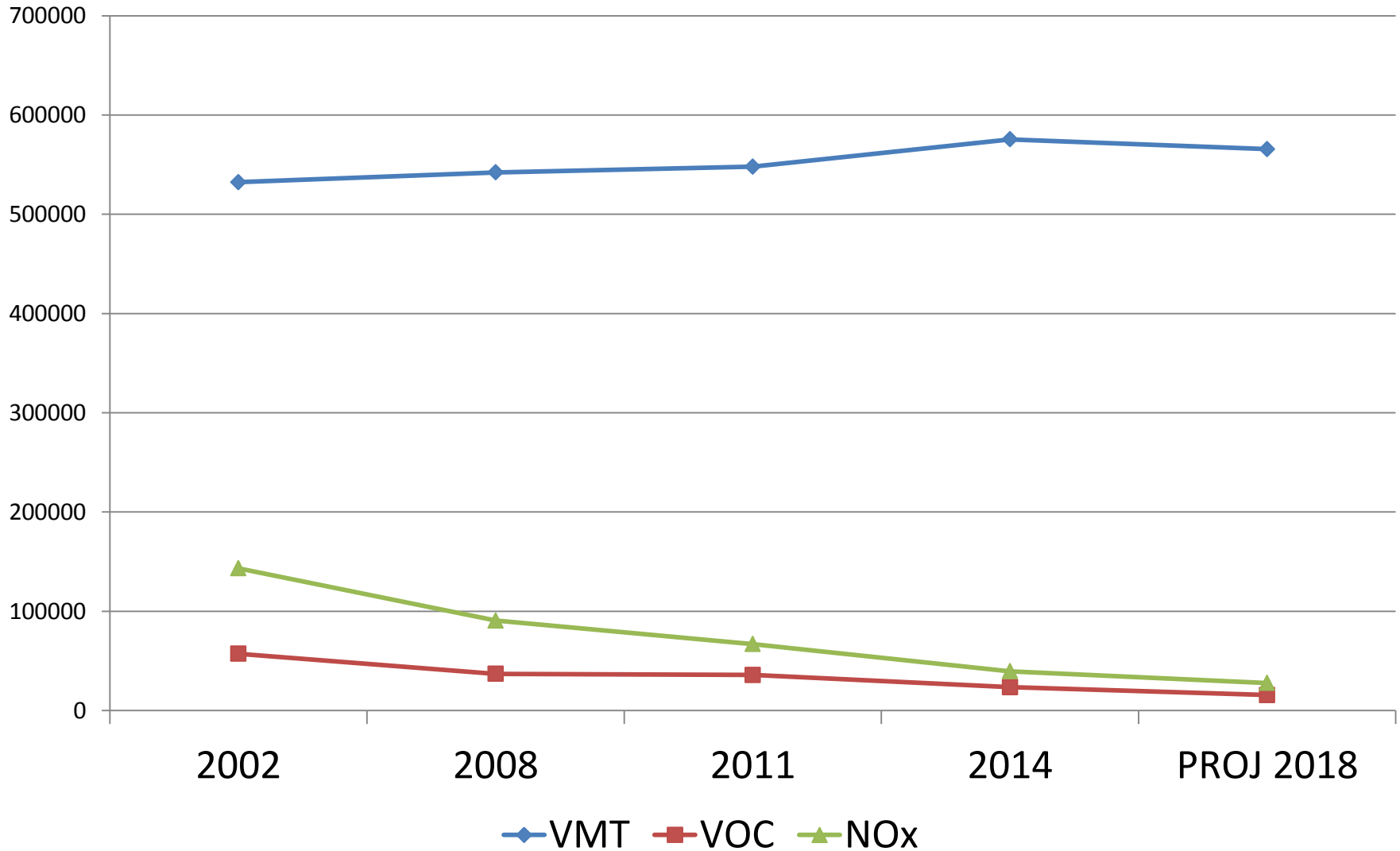
NOx

2002-2014 and EPA 2018 Projections (tons/year)



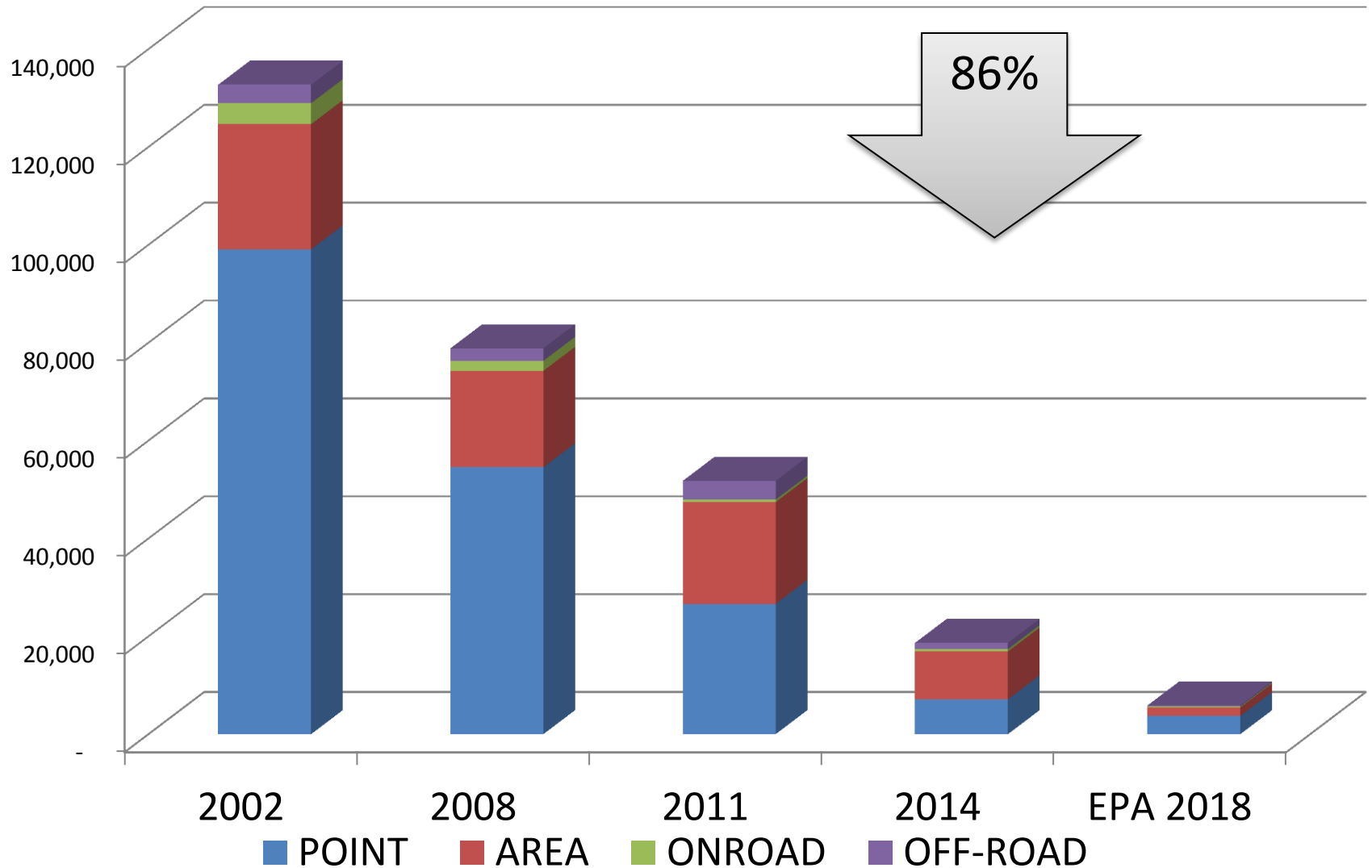
VMT vs. VOC and NOx

2002-2014 and 2018 Projections



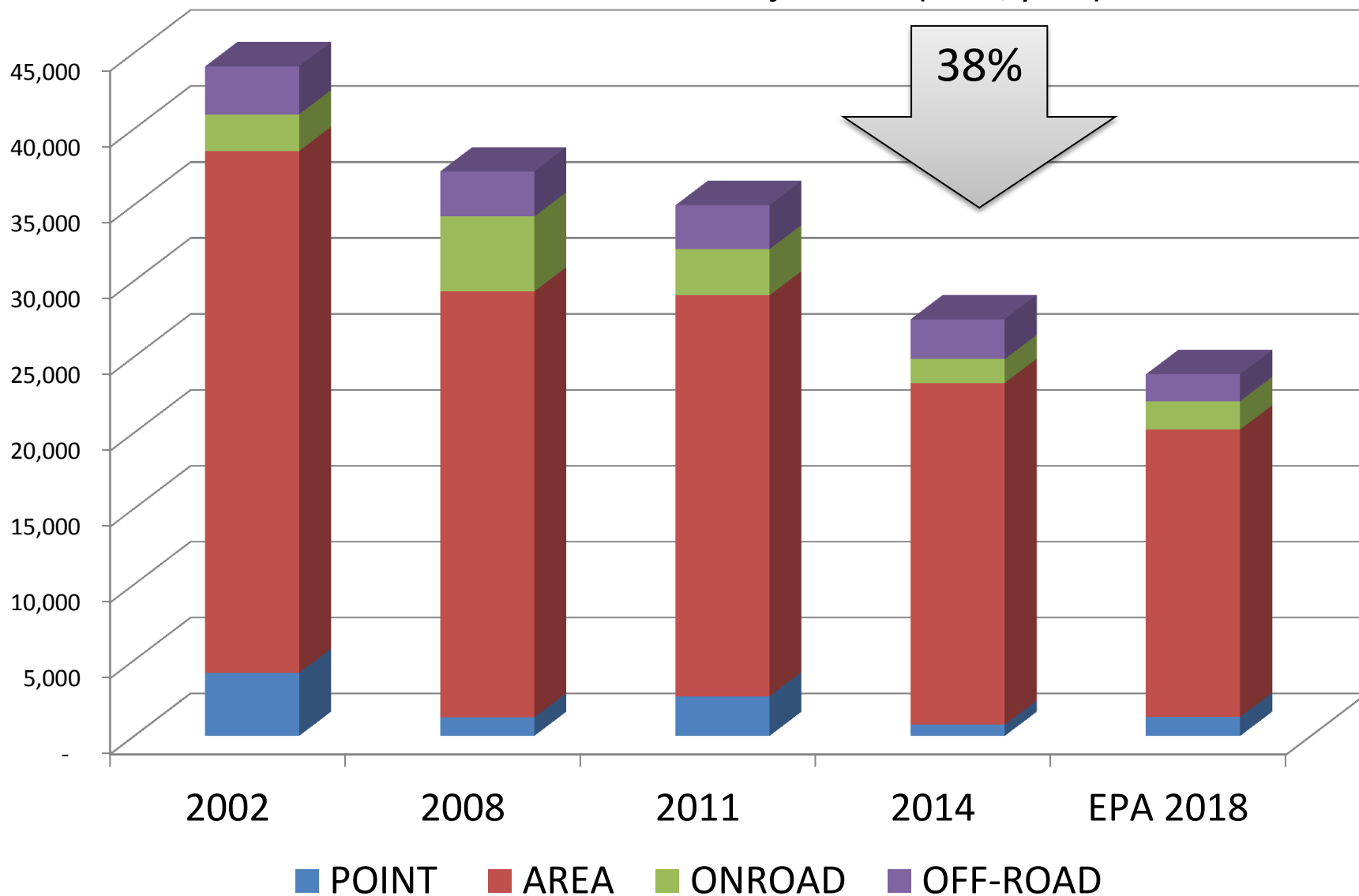
SO2

2002-2014 and EPA 2018 Projections(tons/year)



PM2.5

2002-2014 and EPA 2018 Projections (tons/year)



Regional Haze Five Year Progress Report

Summary of findings

Azin Kavian

Massachusetts Department of Environmental Protection

SIP Steering Committee

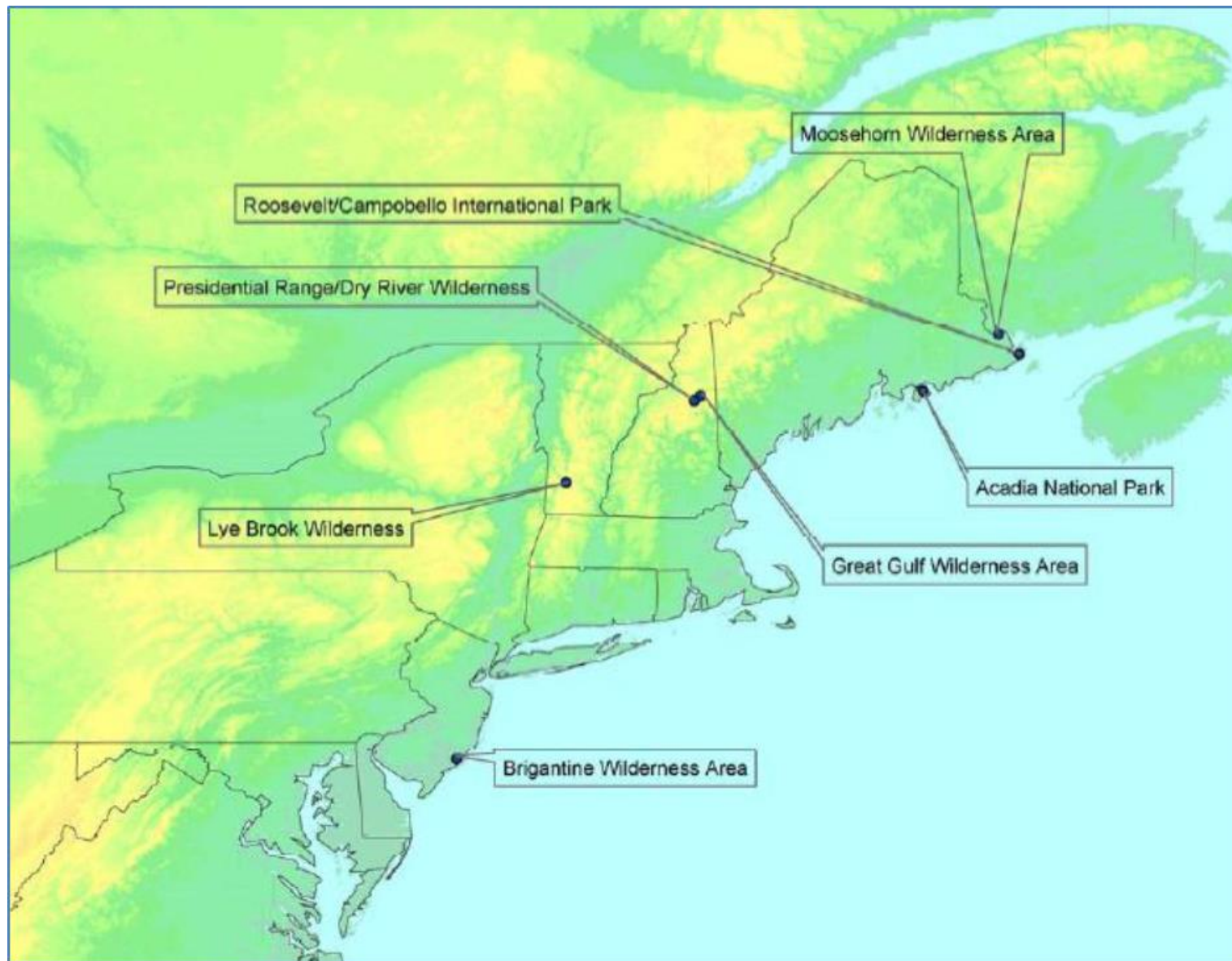
May 23, 2017

Boston, MA

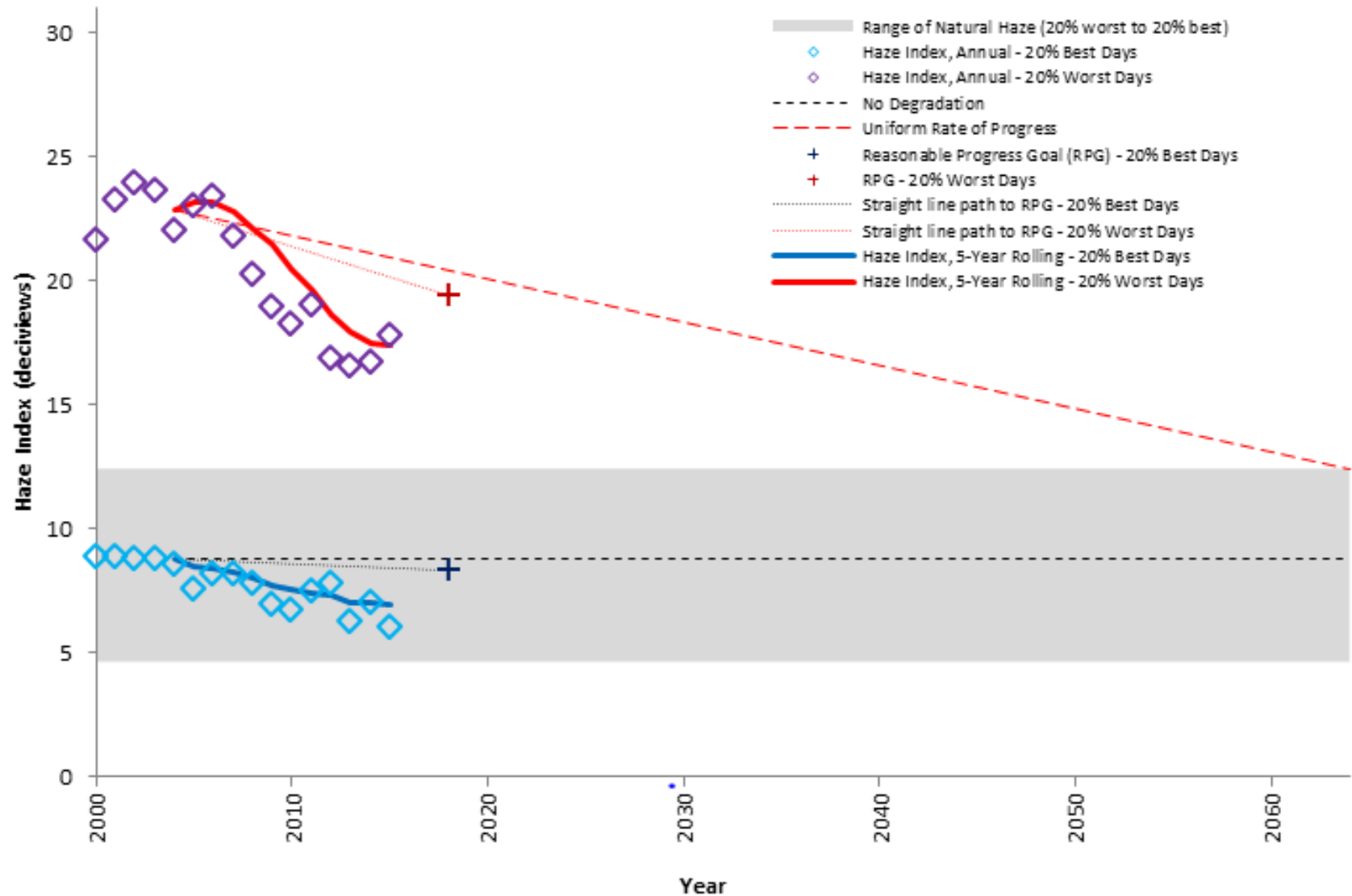


MassDEP

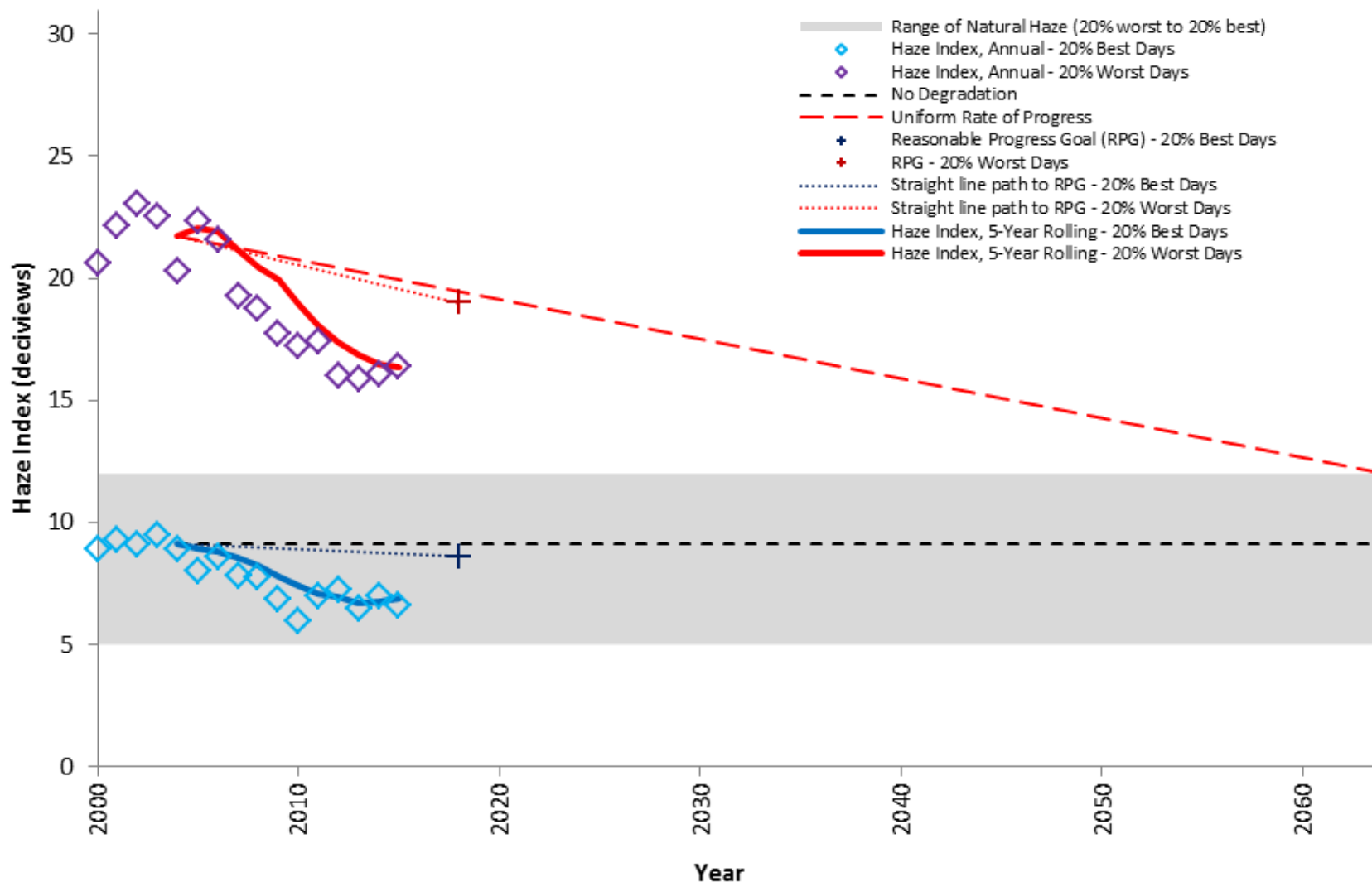
MANE-VU Class I Areas



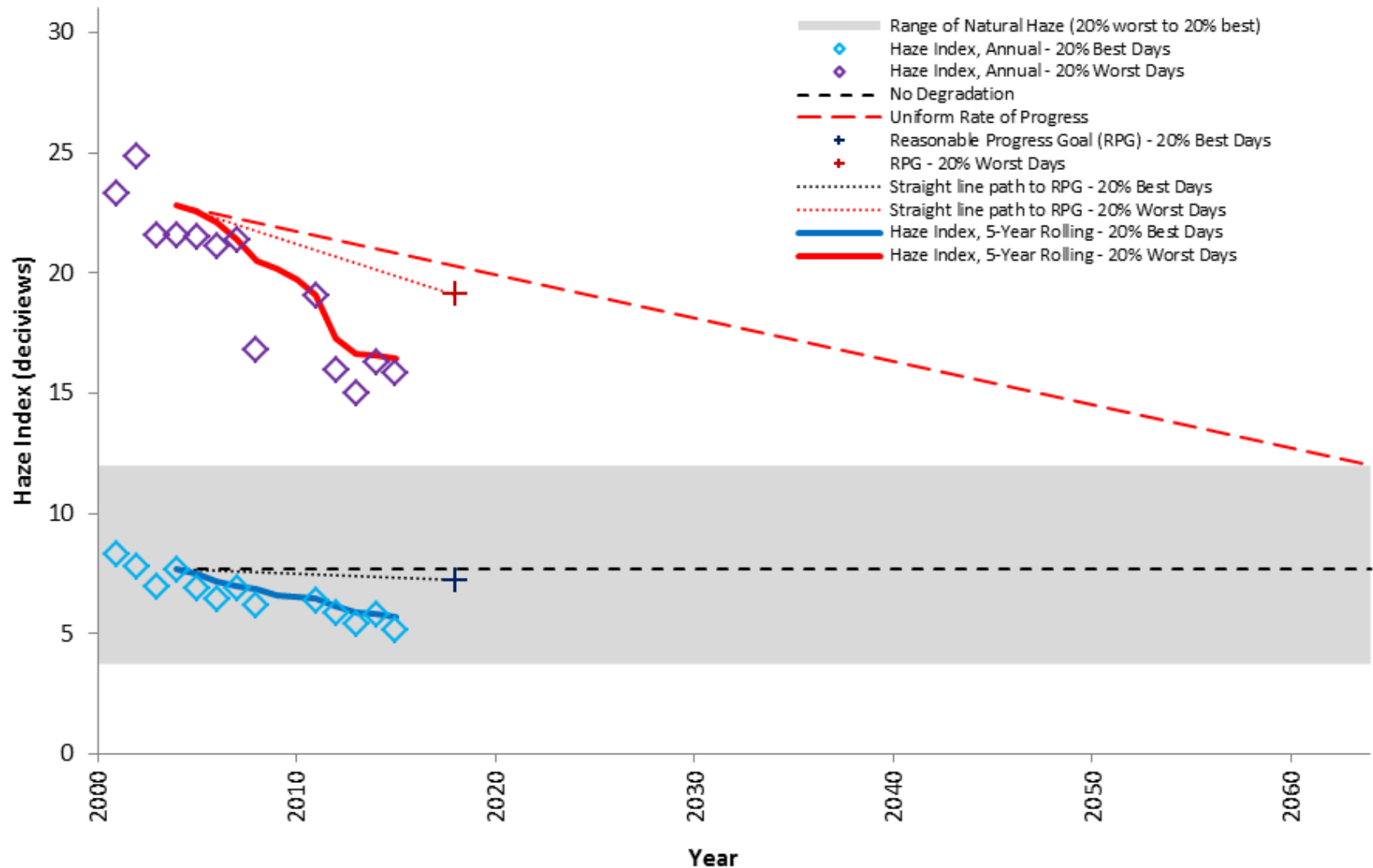
MANE-VU Class 1 Area 2000 – 2015 Visibility Trends: Acadia National Park



MANE-VU Class 1 Area 2000 – 2015 Visibility Trends: *Moosehorn Wilderness*



MANE-VU Class 1 Area 2000 – 2015 Visibility Trends: Great Gulf Wilderness



Key MA SIP Commitments

Implement BART

2 MWC units (Wheelabrator-Saugus)

Alternative to BART for 15 EGUs

Low sulfur fuel oil

#2 Distillate Oil

500 ppm by 7/1/2014; 15 ppm by 7/1/2018

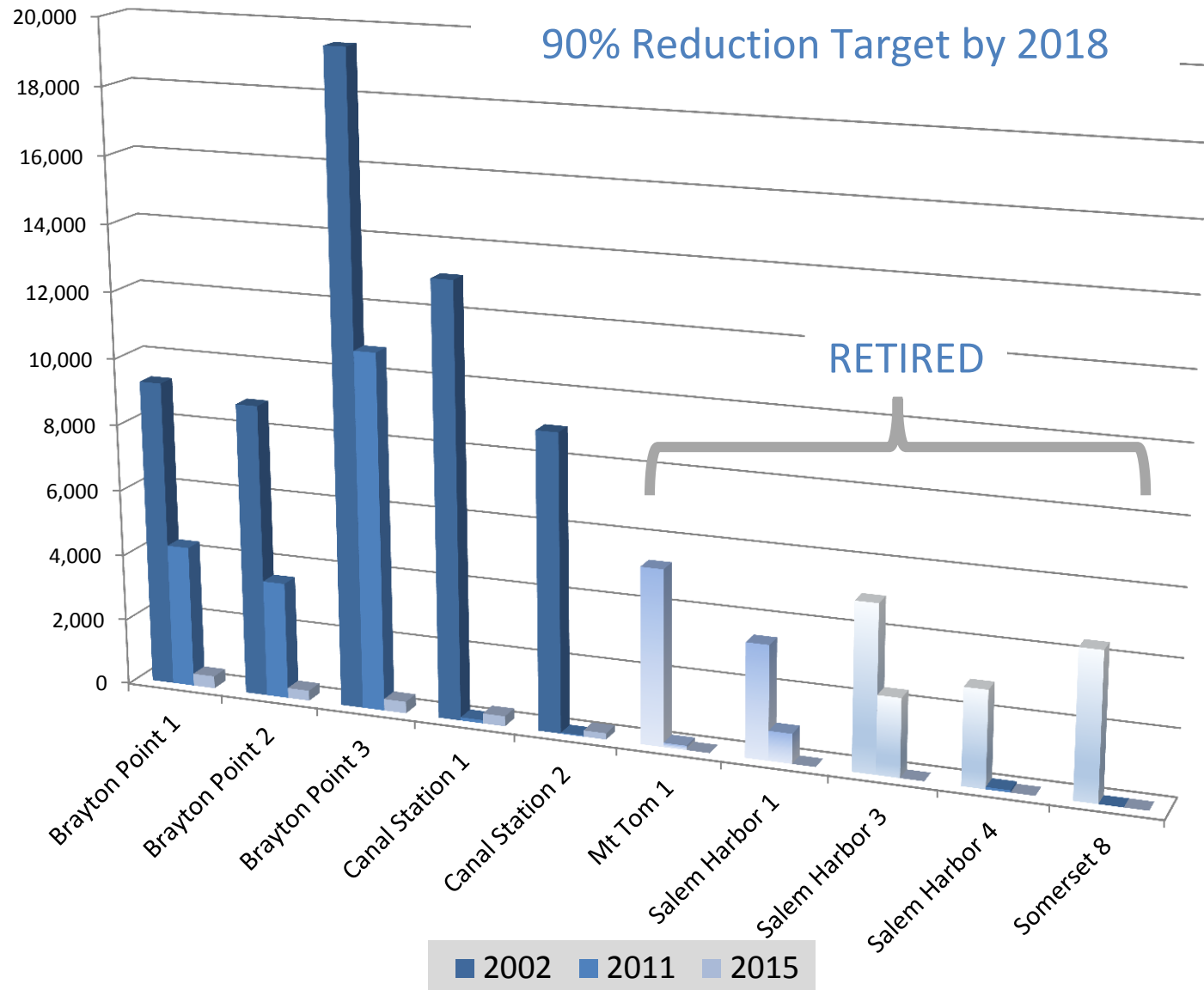
#4 and #6 Residual Oil

1% by 7/1/2014 (0.5% for power plants); 0.5% by 7/1/2018

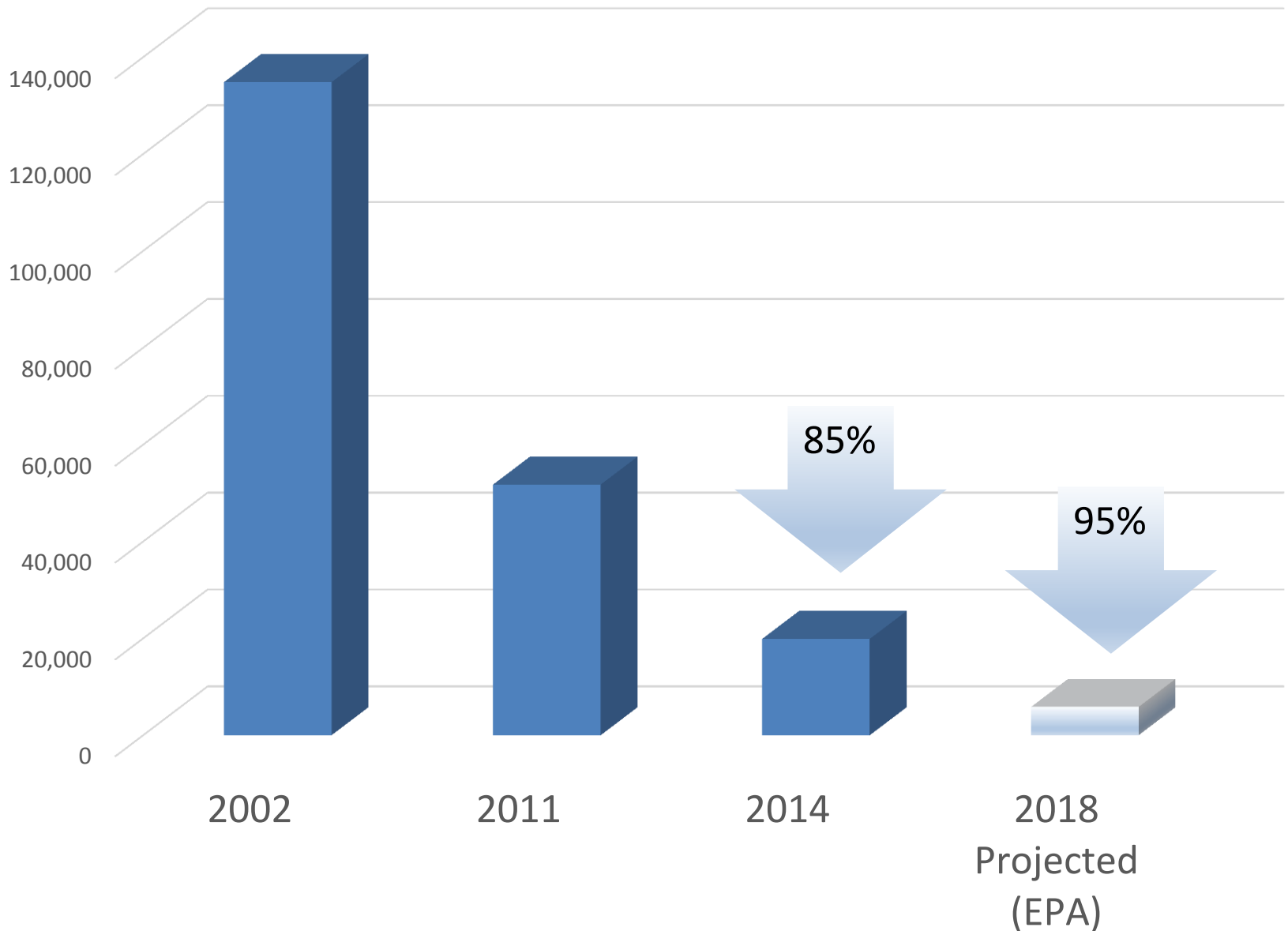
90% reduction in SO_2 from 10 targeted electric generating units (EGUs)

100 EGUs / 167 stacks identified by MANE-VU

SO₂ from Massachusetts Targeted EGUs



SO2 Emissions Reductions from all Sources 2002 – 2018



Summary of Findings

- Visibility has improved at all Class I areas affected by MA sources
 - Improvement for most impaired days
 - No degradation for least impaired days
 - Areas will meet or exceed 2018 goals
- MA is meeting its SIP commitments
- SO₂ emissions from EGUs are already well below levels projected for 2018 in the SIP
- SO₂ emissions from all MA sources are already well below levels projected for 2018 in the SIP now
- No revisions are needed for the SIP
- Federal Land Managers (FLM) and EPA concur with these conclusions