

MANE-VU Technical Support Committee Update

OTC/MANE-VU Fall Meeting
November 5, 2015

Overview

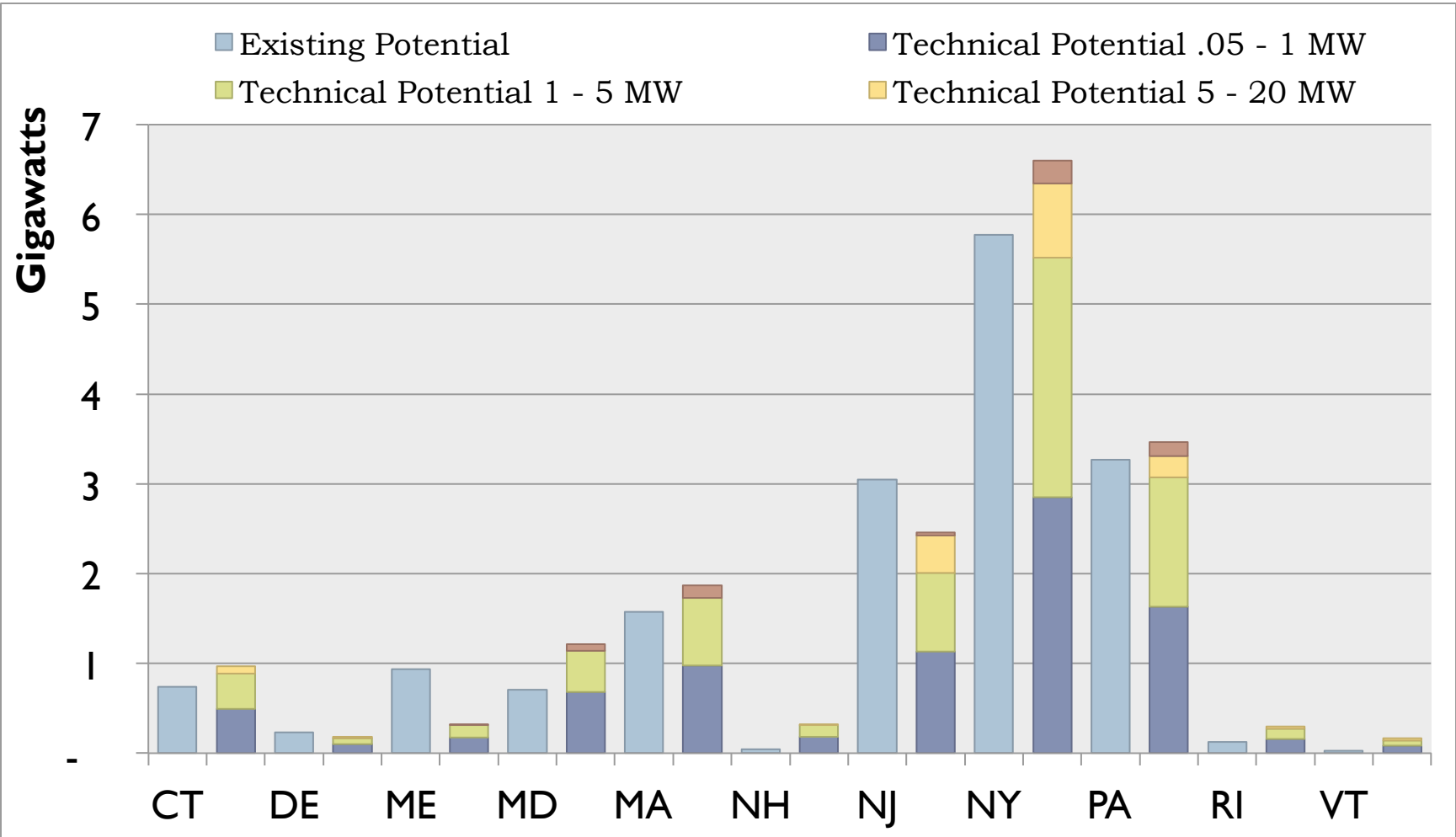
1. CHP Workgroup
2. Regional Haze SIPs
 1. Visibility Data
 2. Inventory/Modeling
 3. Four-Factor Analysis
 4. Contribution Analysis
 5. SIP Planning

Combined Heat & Power (CHP) Overview

- ▶ CHP, or cogeneration, are systems that produce both heat and electricity
- ▶ Trigeneration is when systems also provide cooling
- ▶ Efficiency improves:
 - ▶ Typical separated system: 45%
 - ▶ CHP: 80%
- ▶ Emission Changes
 - ▶ Installations can increase local emissions of NO_x and SO_x , but lead to reductions offsite through decreased electricity production
 - ▶ Transmission losses are also decreased

Existing/Technical CHP Potential in MANE-VU

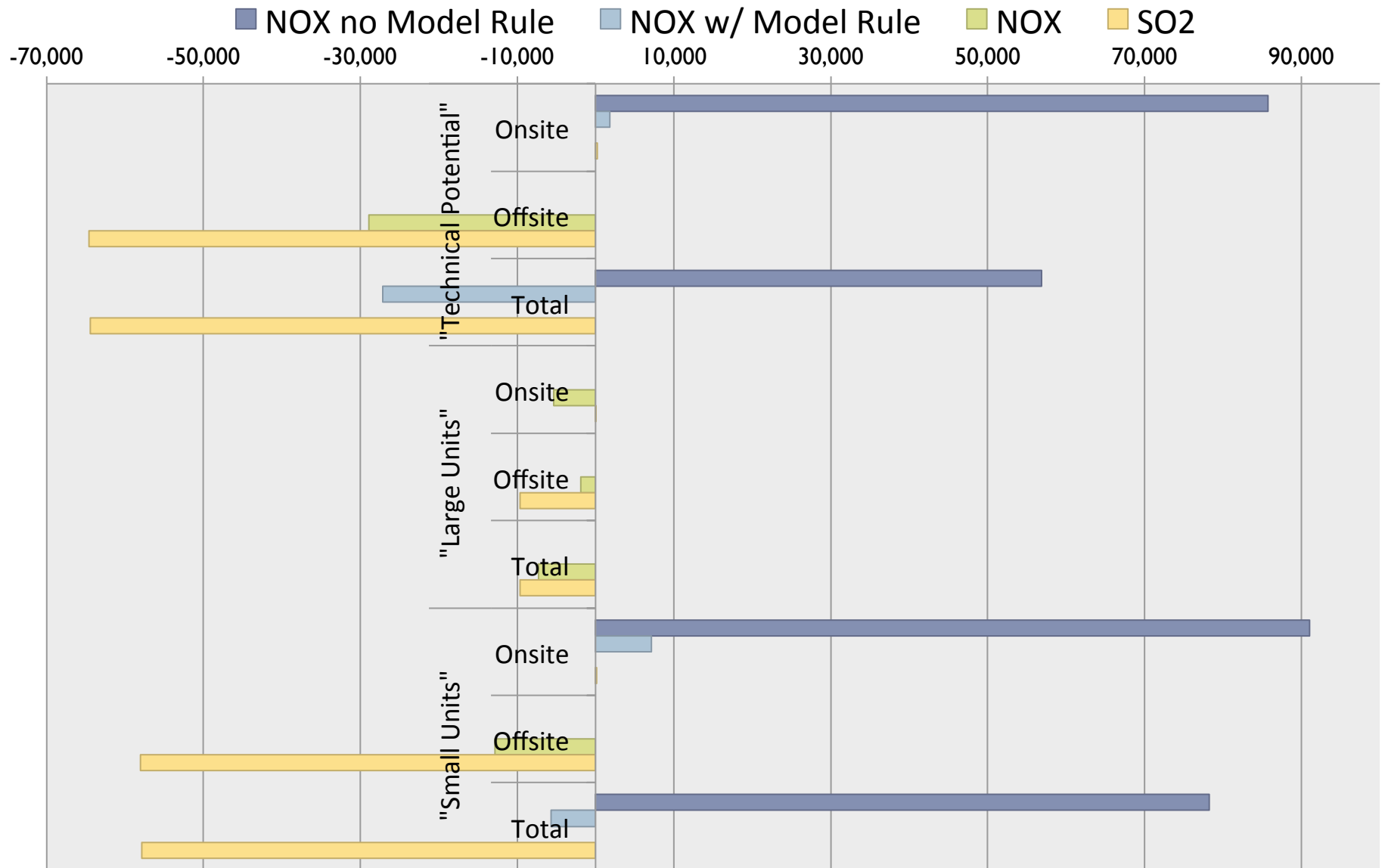
Based on report from ICF on national CHP Applications



CHP Scenarios

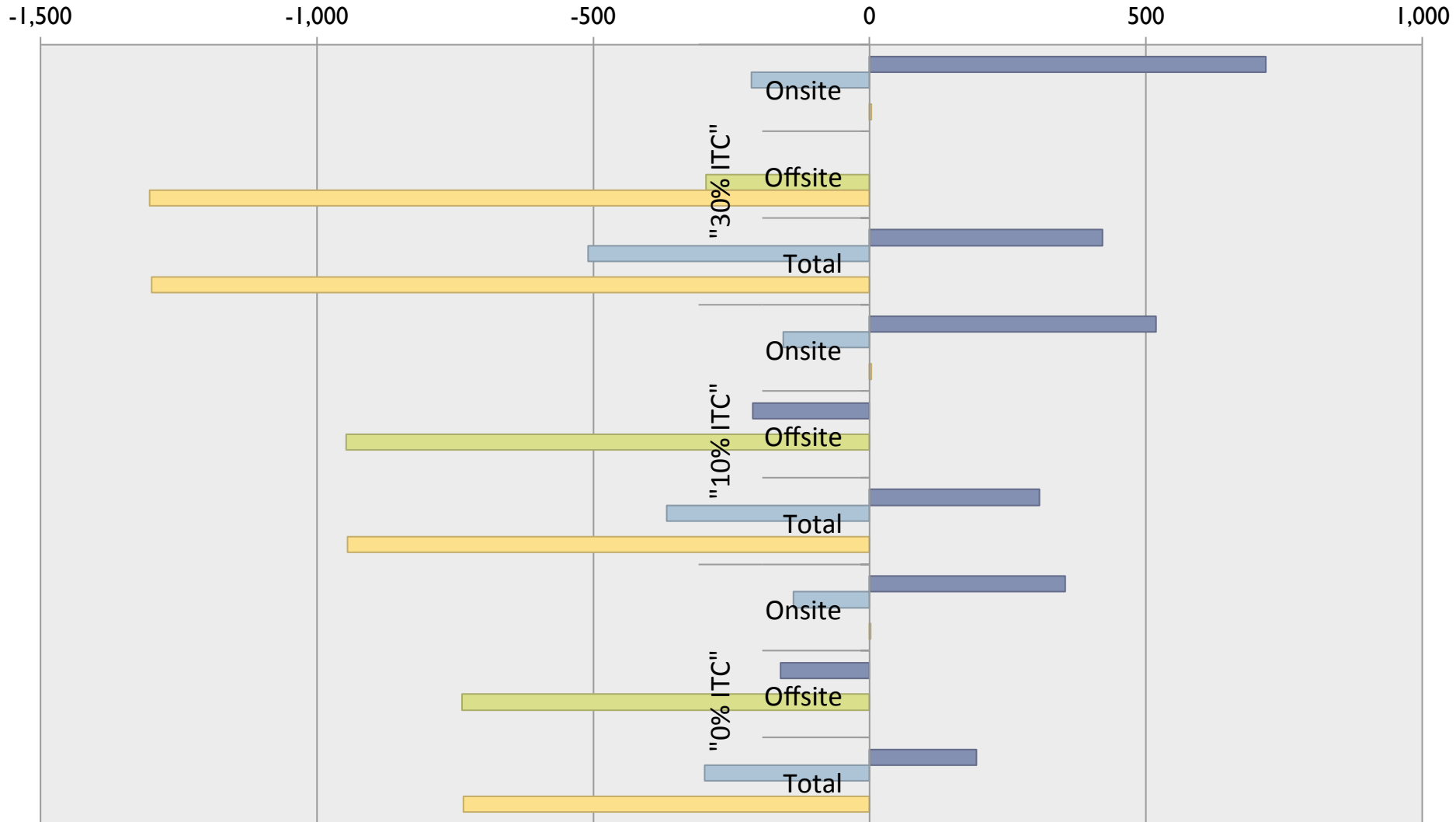
- ▶ Looked at six generation scenarios using ERTAC EGU
 - ▶ Technical
 - ▶ All technical potential
 - ▶ Only systems less than 5MW
 - ▶ Only systems 5MW and greater
 - ▶ Economic
 - ▶ 30% ITC Increase (Investment Tax Credit)
 - ▶ 10% ITC Increase
 - ▶ 0% ITC Increase
- ▶ Looked at 2 onsite emission rate scenarios
 - ▶ Current state rules for small units
 - ▶ All MANE-VU adopts OTC Stationary Generator Model Rule
 - ▶ Lowest Achievable Emission Rate (LAER) was used for all large units

Emission Changes of CHP Technical Potential in MANE-VU



Emission Changes of CHP Economic Potential in MANE-VU

■ NOX no Model Rule
 ■ NOX w/ Model Rule
 ■ NOX
 ■ SO2



CHP Summary and Next Steps

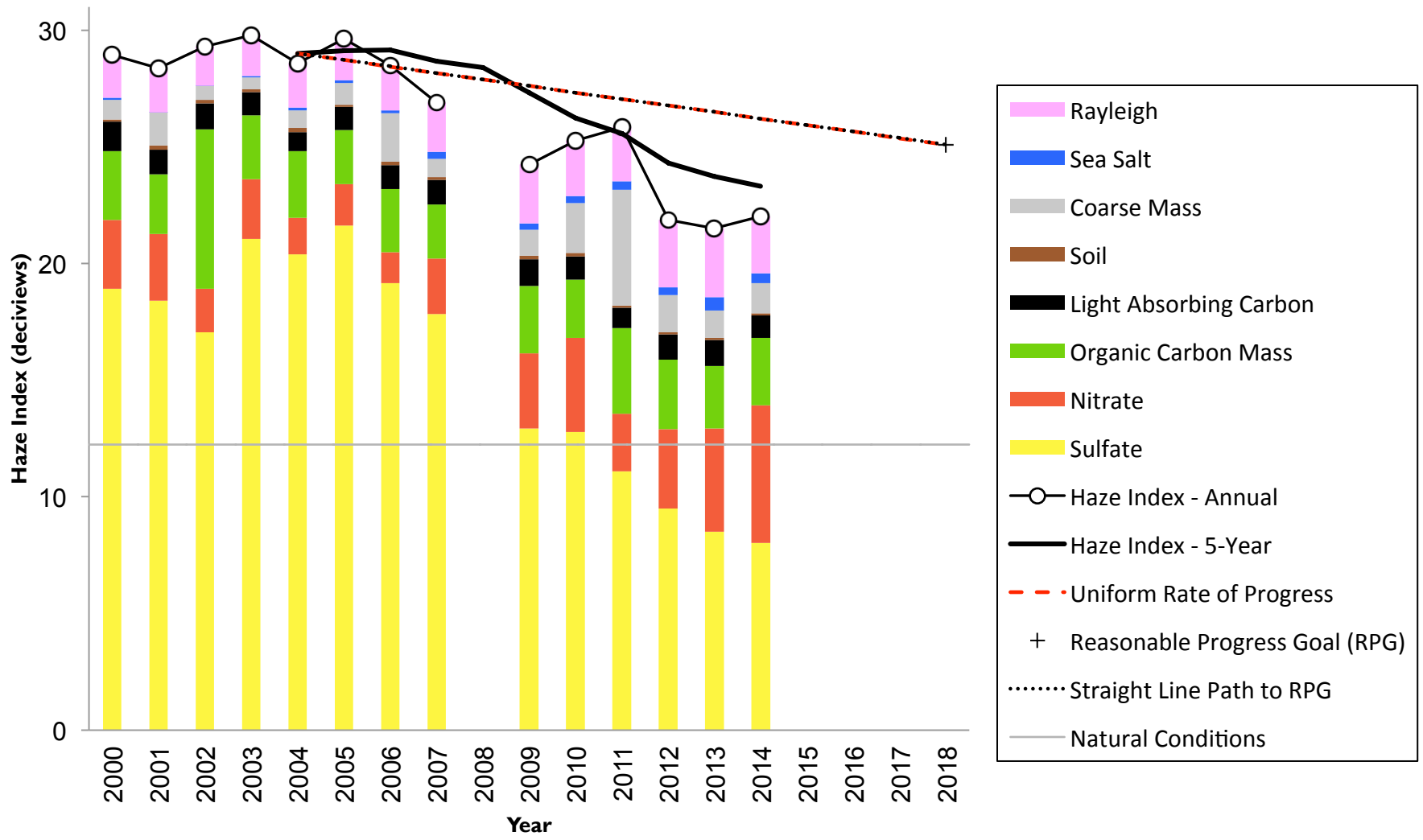
▶ Results

- ▶ CHP installations beneficial for SO₂ reductions
- ▶ CHP installations can be beneficial for NO_x reductions
 - ▶ OTC Stationary Generator Model Rule must be in place for small units
 - ▶ BACT must be implemented for large units

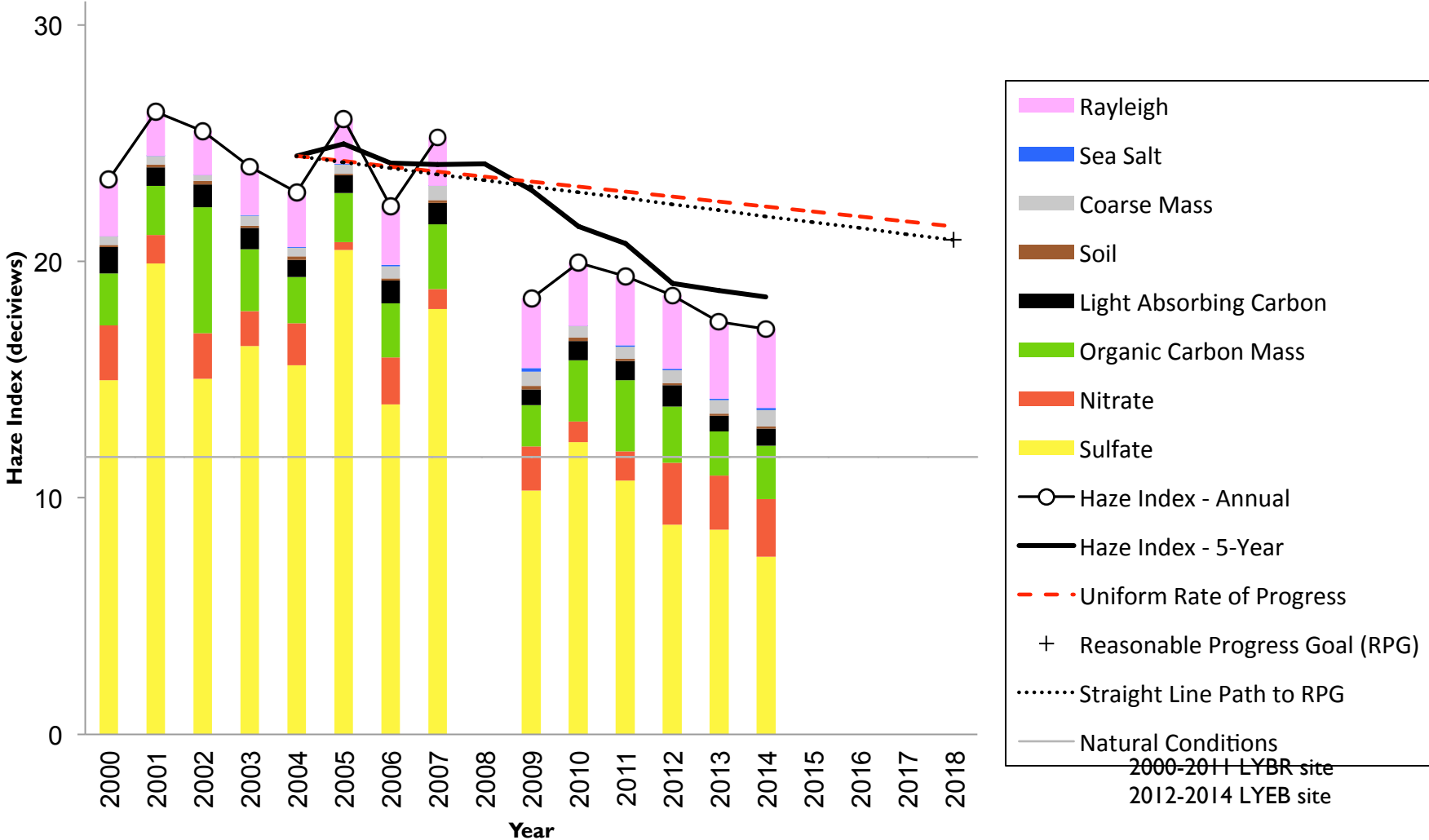
▶ Next Steps

- ▶ Finalize draft of current paper
- ▶ Consider using a more advanced tool such as EPA's AVERT to better focus on marginal EGUs in the region rather than marginal units of one fuel type

Visibility Trends in Brigantine, NJ (Worst 20%)



Visibility Trends in Lye Brook, VT (Worst 20%)



Inventories

- ▶ Regional Haze Inventories

- ▶ Will rely on MARAMA Alpha 2 and EPA mobile projections

- ▶ Status:

- ▶ 2011 is complete

- ▶ 2018 is complete

- ▶ 2028

- ▶ ERTAC EGU v2.4 is complete

- ▶ Draft projections to 2028 are complete (review underway)

- Public webinar scheduled for December 2

- ▶ Need 2025 onroad/nonroad from EPA (forthcoming)

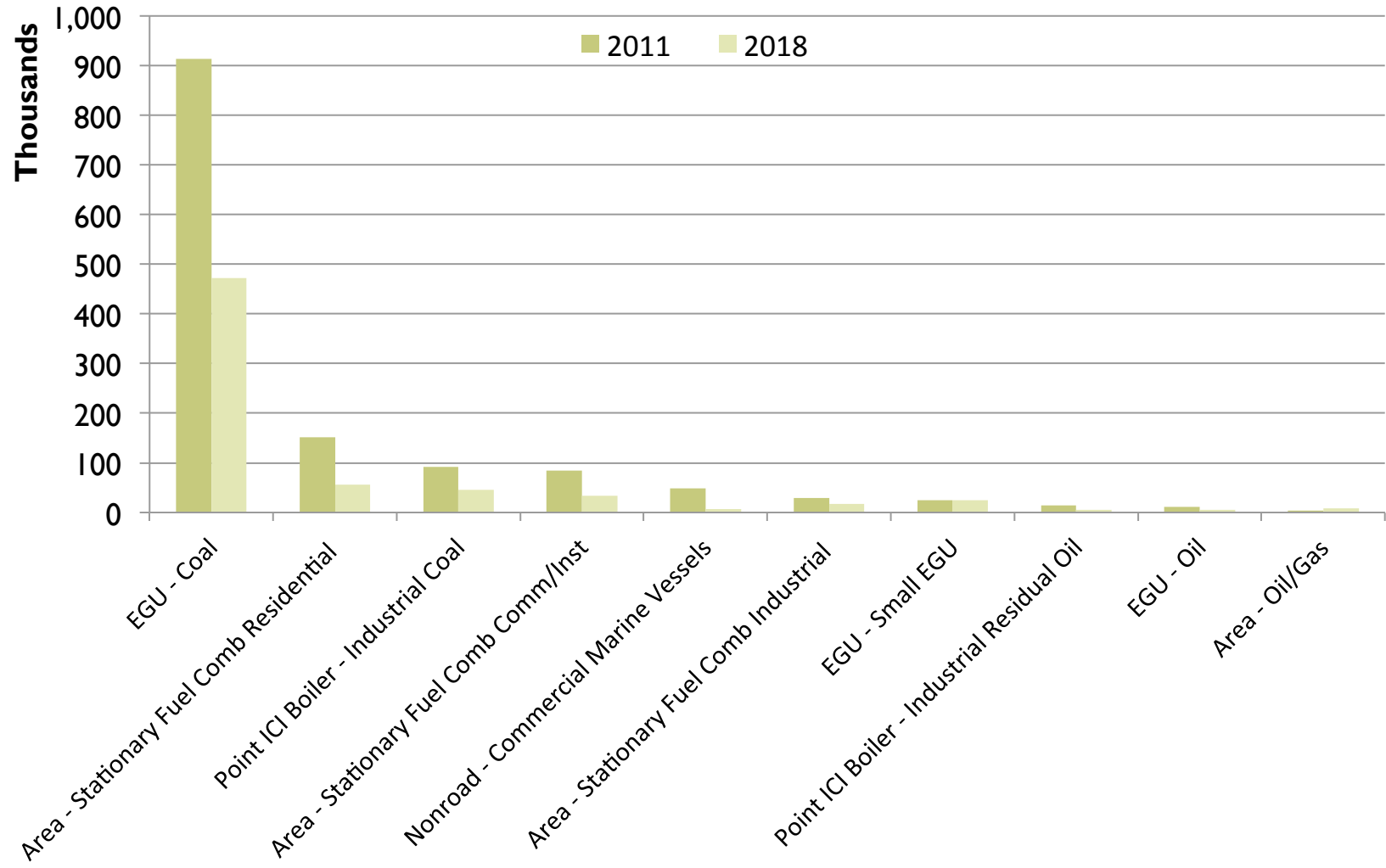
Modeling 2011 vs IMPROVE Data

- ▶ 2011 Base Case Modeling is complete
- ▶ Compared 24-hour monitored IMPROVE data with CMAQ simulation
- ▶ Results adhere to guidelines laid out by EPA for performance of photochemical modeling for regional haze
- ▶ Next Steps:
 1. Complete 2028 inventories
 2. Model 2028 base case using draft inventory

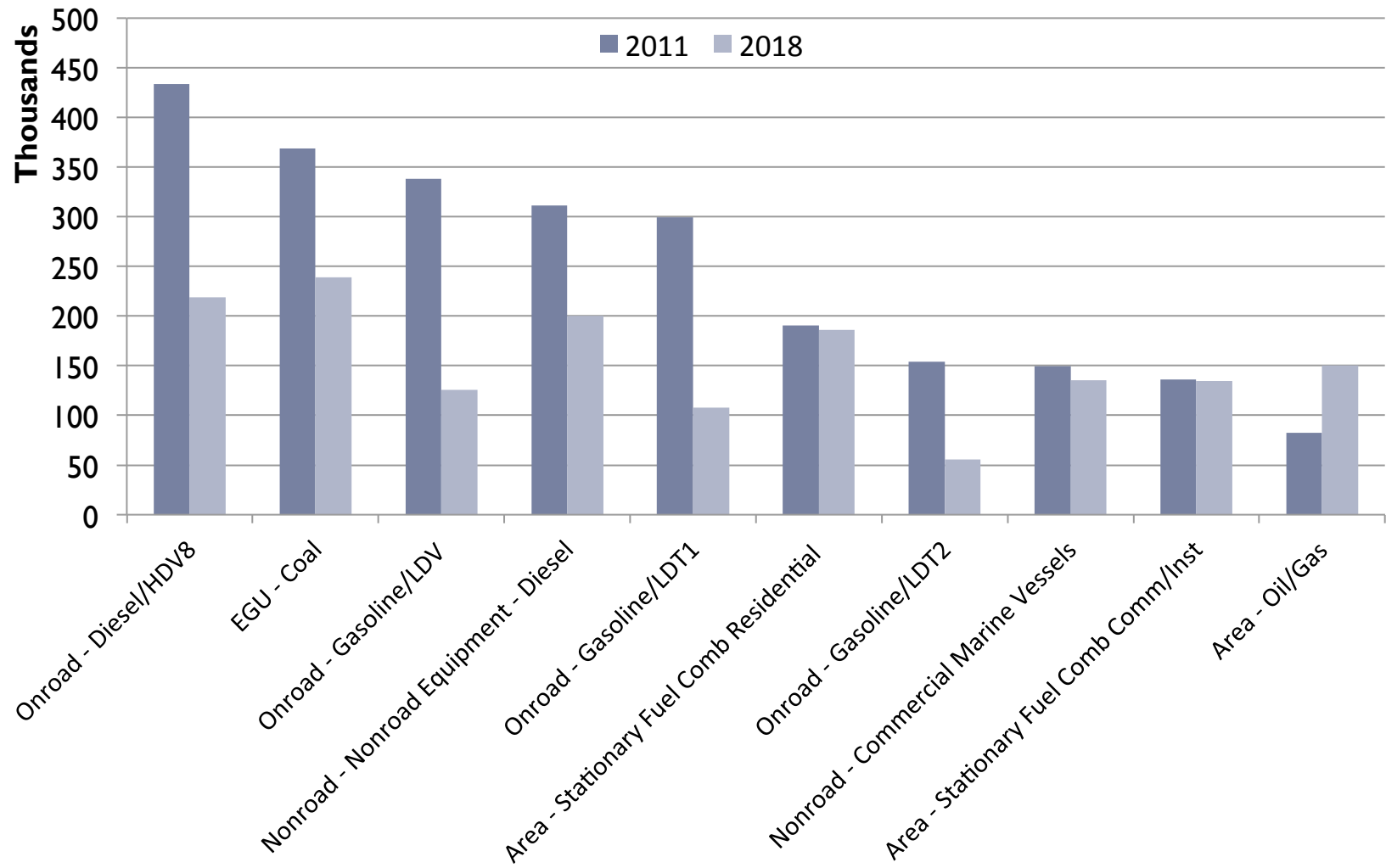
4-Factor Overview

- ▶ 4-Factor analysis is the crux of the regional haze SIP
 - ▶ Answers the question of what is reasonable to control?
- ▶ Inventory Analysis
 - ▶ Will be used to influence which sectors get examined in the 4-Factor Analysis
 - ▶ Examined 2011 and 2018 emissions in MANE-VU
 - ▶ Onroad Mobile: EPA v1
 - ▶ ERTAC EGU: v2.3
 - ▶ Other Sectors: MARAMA Alpha 2
- ▶ Next Steps:
 - ▶ Contractor will update CoST data
 - ▶ Contractor will update some sections of the previous 4-Factor Analysis documents

4-Factor Inventory Overview: MANE-VU SO₂ (Tons)



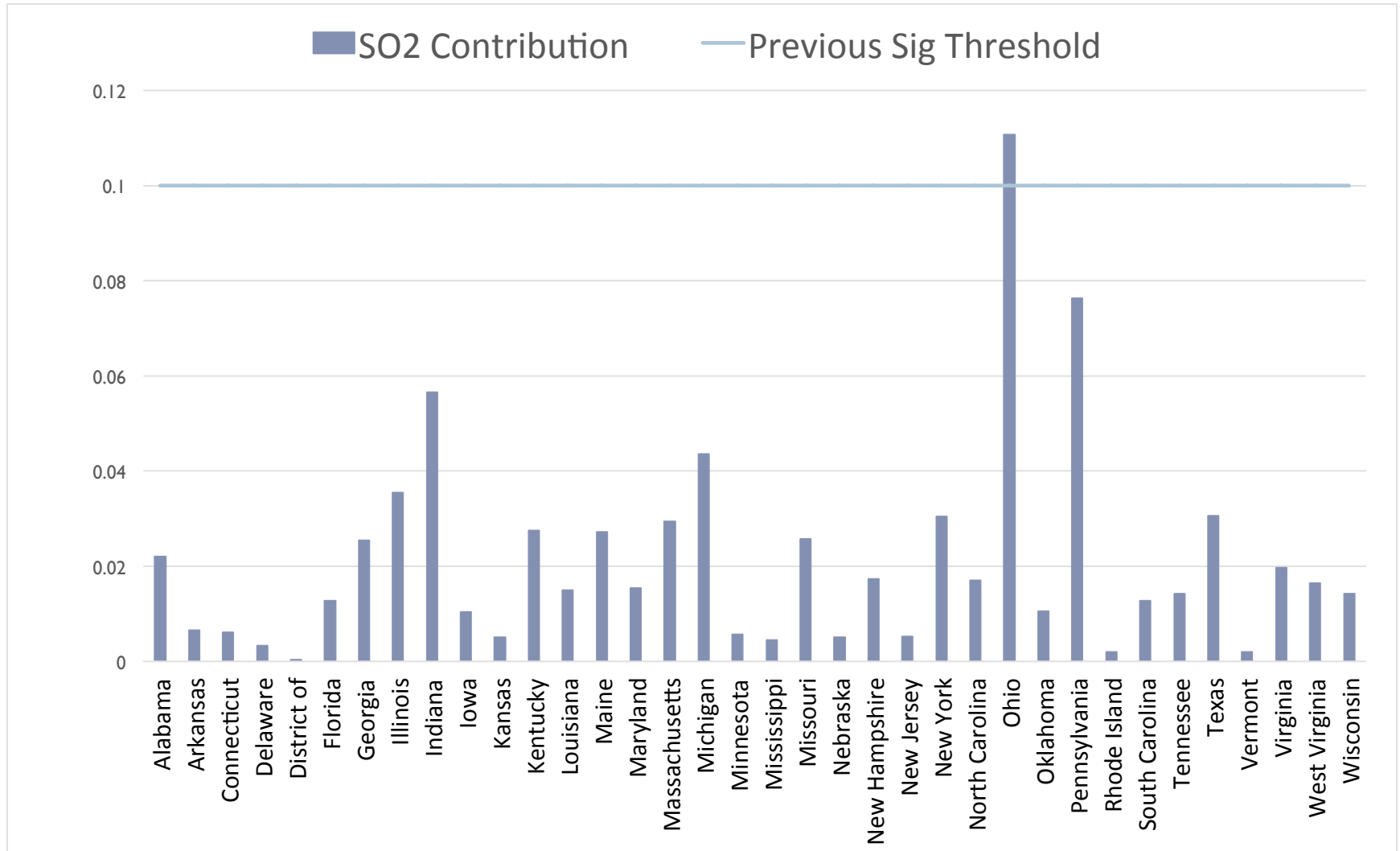
4-Factor Inventory Overview: MANE-VU NO_x (Tons)



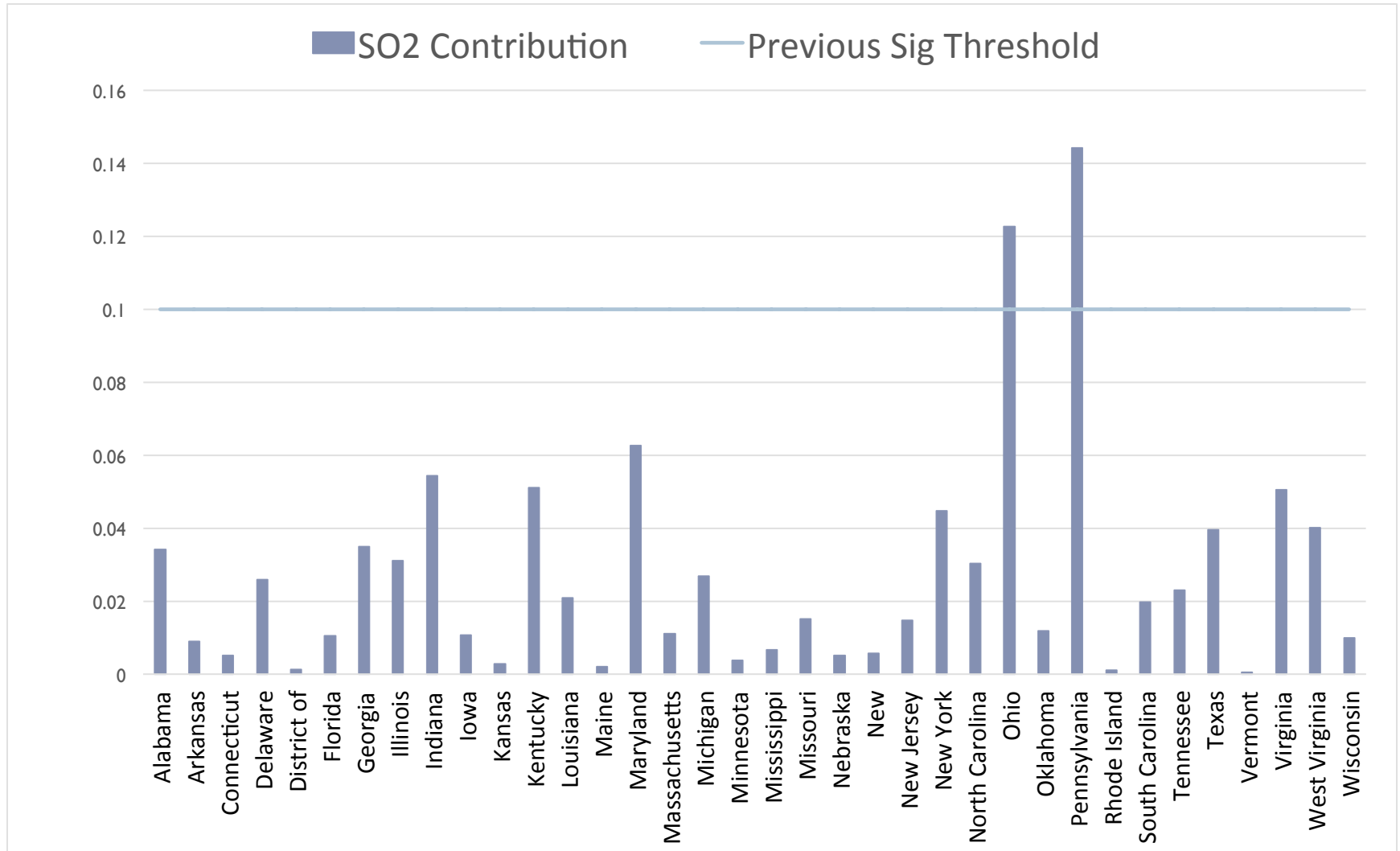
Adjusted Emissions/Distance (Q/d)

- ▶ Workgroup conducted a Q/d analysis, adjusted by a meteorological factor for Class I sites
- ▶ Focused on aggregated emissions at state centroids
- ▶ Used the 2011 MARAMA alpha 2 emission inventory
- ▶ Relied on similar methodologies to the NESCAUM reports that looked at the 2002 & 2007 inventories
- ▶ Next Steps:
 - ▶ Point source specific analysis
 - ▶ 2018 analysis

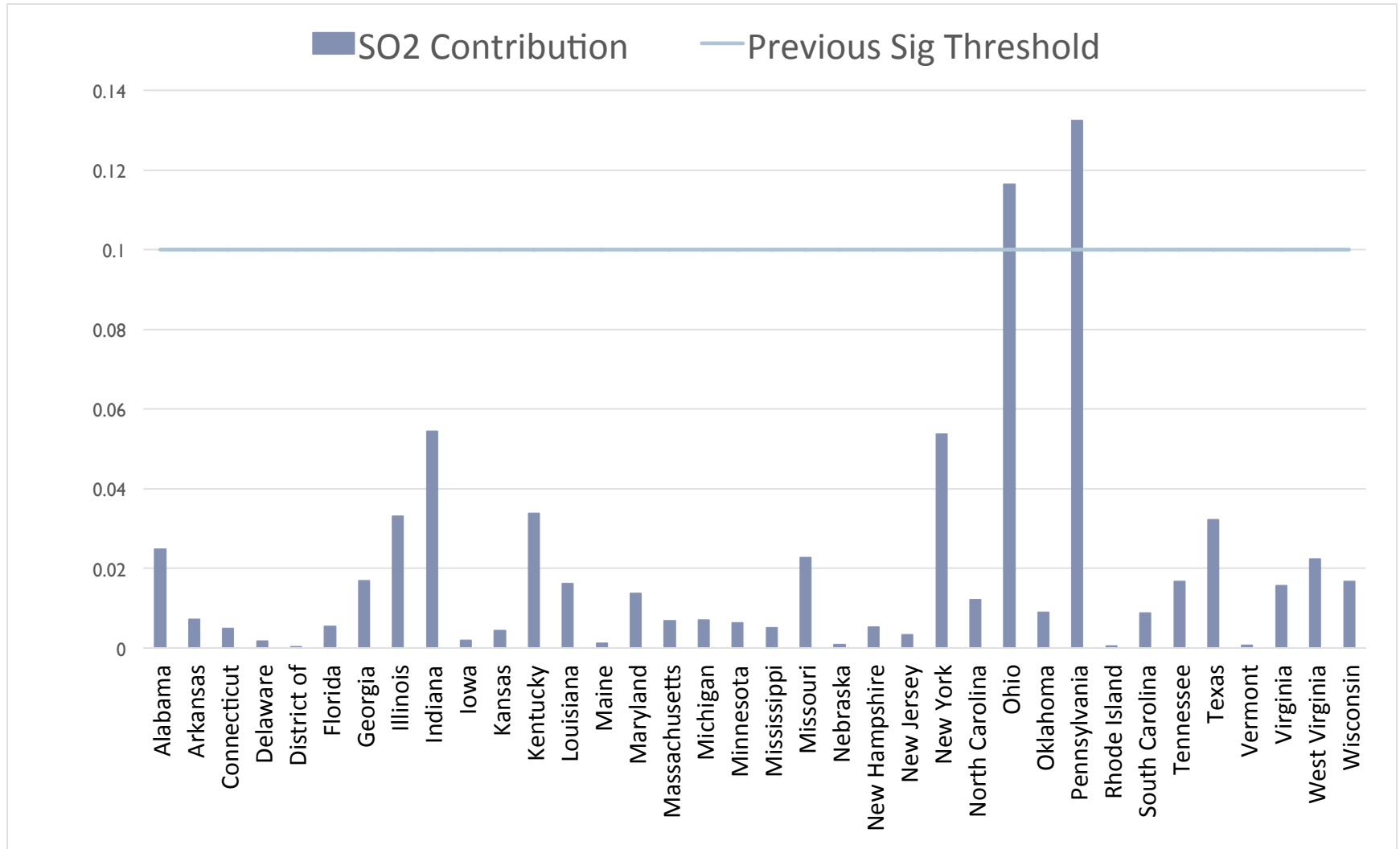
Acadia SO₂ Adjusted Q/d



Brigantine SO₂ Adjusted Q/d



Lye Brook SO₂ Adjusted Q/d



Regional Haze SIP Planning Schedule

Regional Activity	Steps	Timeframe
Training	Training	Complete
IMPROVE Data Analysis	Decisions on Methods	Complete
	2014 Data Availability	Available
	Calculations and QA	Fall of 2015
Inventory Development	2028 ERTAC EGU	Complete
	2011 EPA Modeling Inventory	Complete
	2028 EMF Projections of 2018	Fall 2015
Photo Chemical Modeling	2011 Met Modeling	Complete
	2011 Base Case Modeling	Complete
	2028 Base Case Modeling	Winter 2015
	2028 Control Modeling	Fall 2016
Contribution Assessment	Final Q/d	Spring 2016
	Modeled Contrib. Assessment	Summer 2016
RPGS/4 Factor Analysis	Inventory Analysis of Sectors	Complete
	Cost Analysis	Spring 2016
	167 Stack Review	Spring 2016
Consultation	?	?

Questions?

Acadia, ME



Brigantine, NJ

