



Department of
Environmental
Conservation

Reasonable Progress Goals & Long-Term Strategy

Rob Sliwinski

April 21-22, 2015

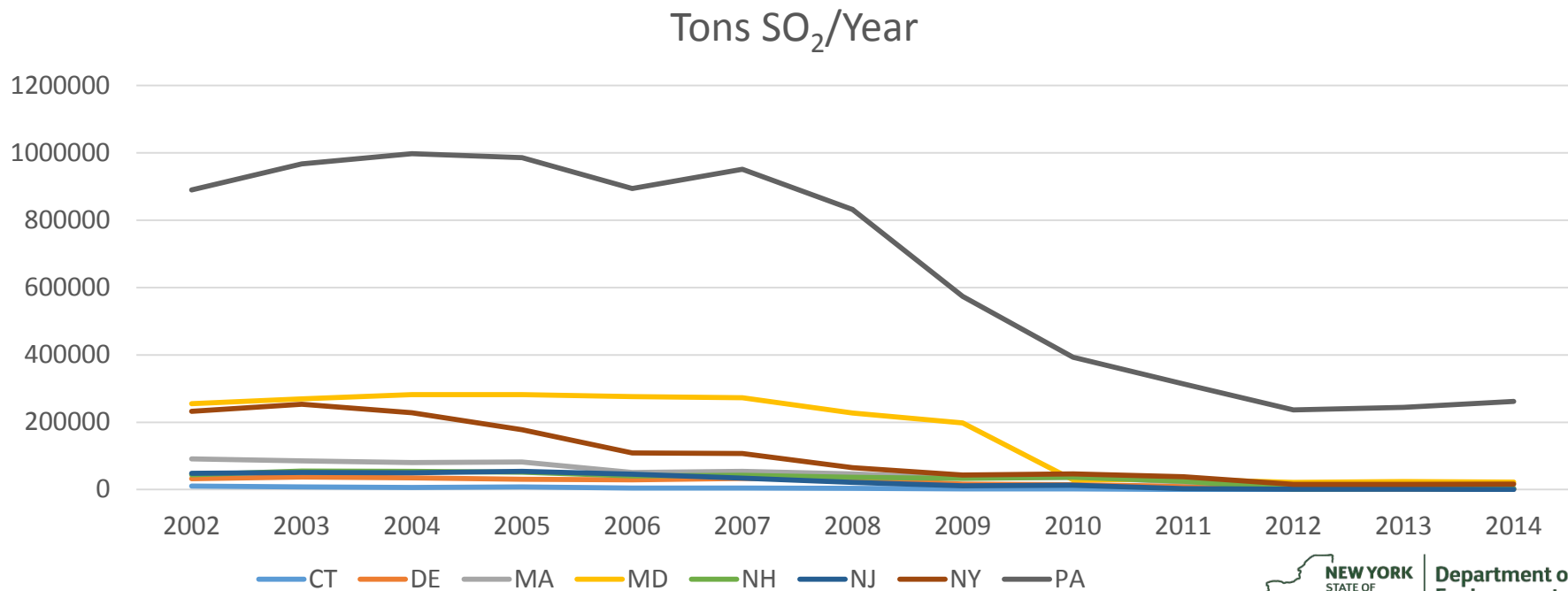
The First Regional Haze State Implementation Plan Submittal

- First submittal (2010) that covered until 2018.
- Lessons learned from first submittal.
- Sulfur has been reduced quite a bit since the first RH SIPs were submitted, but sulfate is still the dominant pollutant in MANE-VU

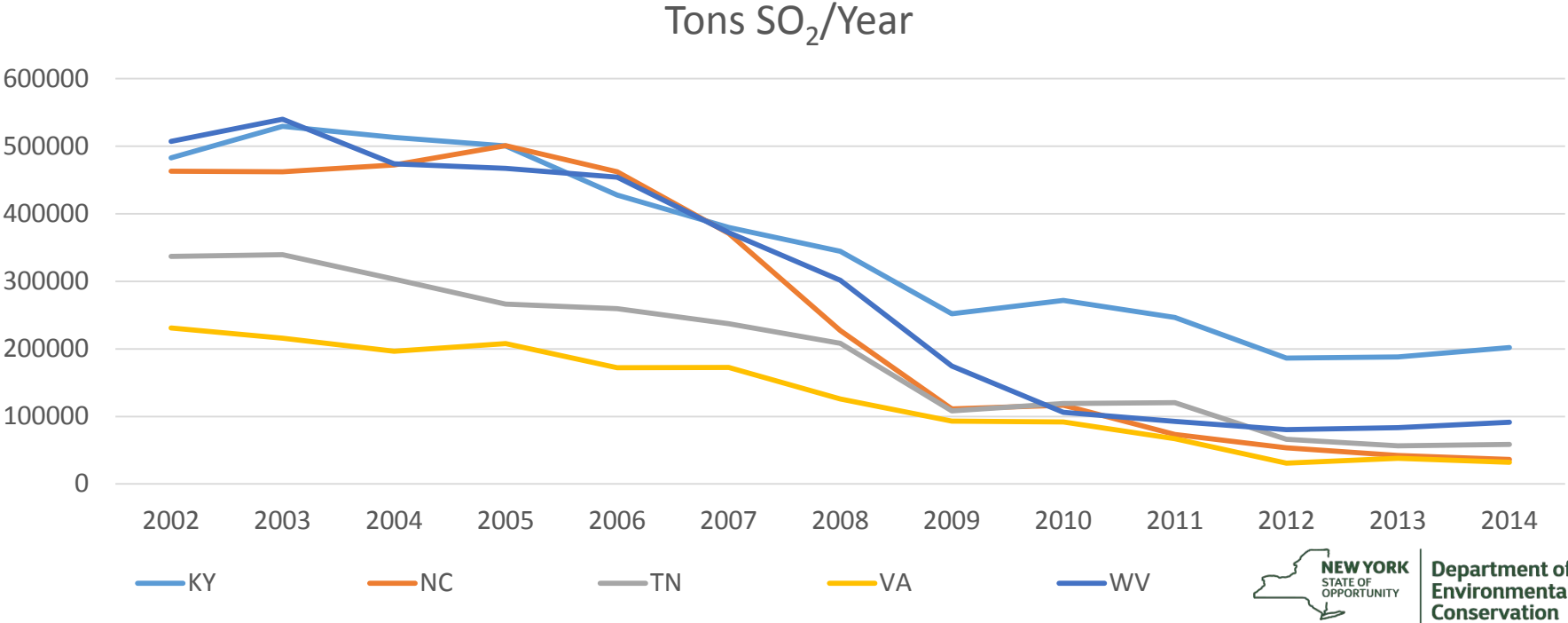


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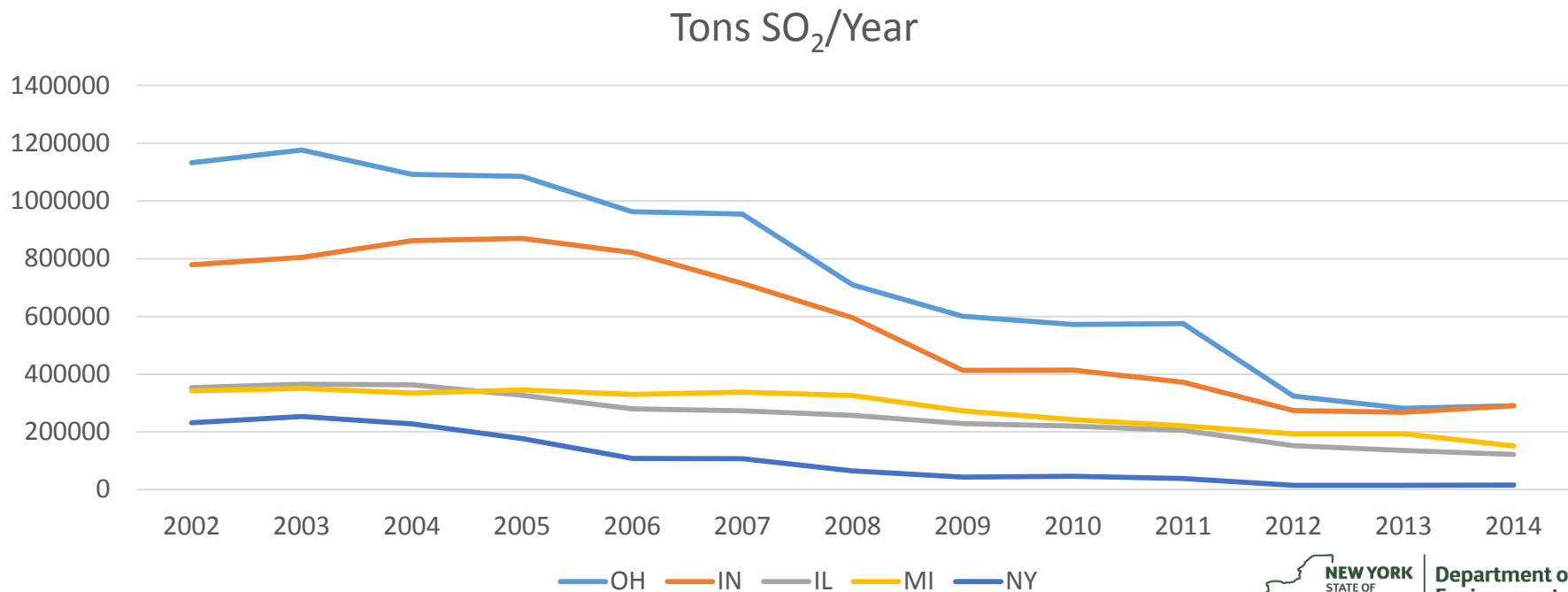
MANE-VU States EGU SO₂ Trends



Upwind States (SESARM) EGU SO₂ Trends



Upwind States (LADCO) EGU SO₂ Trends



Progress goals for states with Class I areas

- RHR requires states to adopt progress goals for improving visibility from baseline conditions every ten (10) years for each Class I area in the State
- State required to set progress goals for each Class I area in the state:
 - Provide for improvement in visibility for the most impaired (20% worst) days over the period of the SIP
 - Ensure no degradation in visibility for the least impaired (20% best) days over the period of the SIP
- Track progress on best days & worst days to determine if emission reduction strategies result in improvement in visibility conditions
- If best day conditions degrade over time, states should re-evaluate their emission reduction strategies
- Provide an assessment of number of years it would take to attain natural visibility conditions if improvement occurs at rate represented by RPG.



Requirements for states without Class I areas

- Do not establish any progress goals in their SIPs
- Required to consult with other States having Class I areas that may be impacted by emissions from the State
- Needs to adopt emission reduction strategies to address its contribution to visibility impairment problems in Class I areas located in other States



Reasonable Progress Goals & Rate of Progress Determination

- Provide for a rate of improvement sufficient to attain natural conditions by 2064
- States determine whether they are meeting their goals by comparing visibility conditions from one 5-year average to another
- In developing progress goal, State needs to analyze rate of improvement between baseline & future periods (2018, 2028, etc.)
- If improvement rate maintained in subsequent implementation periods, natural conditions would be achieved in 2064



Rate of improvement determination

- State must demonstrate in the SIP whether it finds that rate of improvement is reasonable
- Must consider relevant statutory factors (i.e. reasonable progress factors, also known as 4-factor analysis) in CAA
- If improvement rate is not reasonable, State evaluates alternative rates of progress
- Include demonstration supporting finding that alternate rate is reasonable



Reasonable Progress Factors (4-Factor Analysis)

- Potential controls for selected source categories
- Considered in developing any progress goal
 - Costs of compliance
 - Time necessary for compliance
 - Energy & non-air quality environmental impacts of compliance
 - Remaining useful life of any existing source subject to such requirements



MANE-VU Regional Haze Control Measures for the 2018 milestone

- Beyond-CAIR (CAIR+) sulfate reductions from electricity generating units (EGUs)
- Low-sulfur oil strategy for #2, #4, and #6 residual oils for both the residential and commercial heating and oil-fired ICI boiler source sectors, and
- Controls on:
 - ICI boilers (both coal and oil-fired),
 - lime and cement kilns,
 - residential wood combustion (including outdoor wood boilers), and
 - outdoor burning.



Other State Specific Programs

- Asphalt production plants in CT, DC, NJ, and NY;
- Cement kilns in ME, MD, NY, PA;
- Glass and fiberglass furnaces in ME, MD, NY, PA;

4-Factor Analysis Issues

- How do we develop 4-factor analysis for RH progress goals for 2028?
 - We have yet to identify specific RH visibility improvement programs
 - Below the uniform rate of progress goals for 2028
 - Need to hear expectations from Class I Area states
 - Look to existing (On-the-Books) and expected (On-the-Way) programs to understand progress
 - Need to coordinate with the work being done upwind and in MANE-VU
 - Timing considerations (MANE-VU to meet 2018 deadline, others later)

The Next Regional Haze State Implementation Plan Submittal

Other work will impact RH SIPs

- 2010 SO₂ NAAQS
- 2012 PM_{2.5} 24-hr NAAQS
- Clean Power Plan (111(d))
- Mercury and Air Toxics Standards (MATS) Rule
- 2008 and 2015 Ozone NAAQS (CSAPR, CSAPR+, additional measures)
- Reciprocating Internal Combustion Engines Maximum Achievable Control Technology (RICE MACT)
- Year Round NO_x Control Opportunities

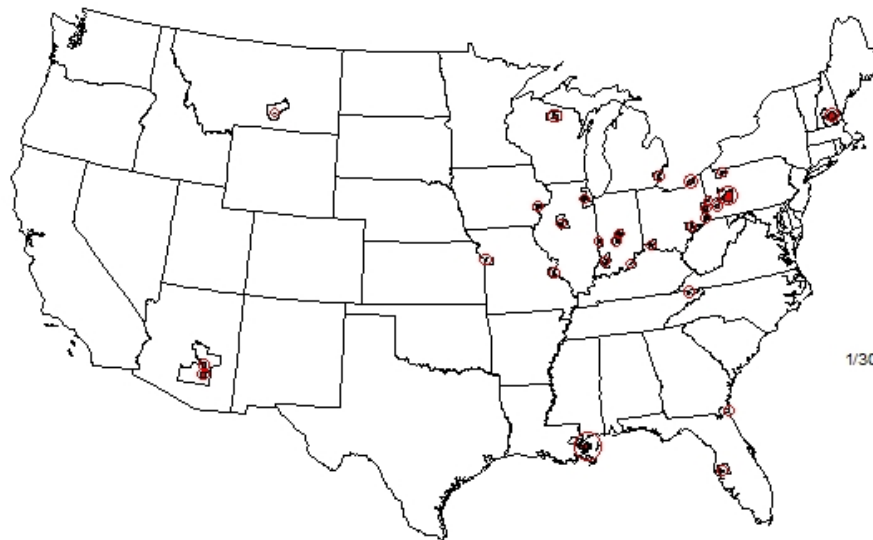


2010 SO₂ NAAQS

- 4/6/15 *State Attainment Plans Due (Round 1 – Monitored Violations)*
- 9/18/15 Recommend updates to designation/areas near large sources
- 7/2/16 EPA designates large sources/*Implement controls to avoid NA designation*
- 1/13/17 Recommend updates to designations/rest of state
- 12/31/17 *EPA designates ROS/Implement controls to avoid NA designation*
- 7/2/19 State Attainment Plans Due (Round 2 – 69 Power Plants and New Monitored Violations)
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SO2 Nonattainment Areas (2010 Standard)



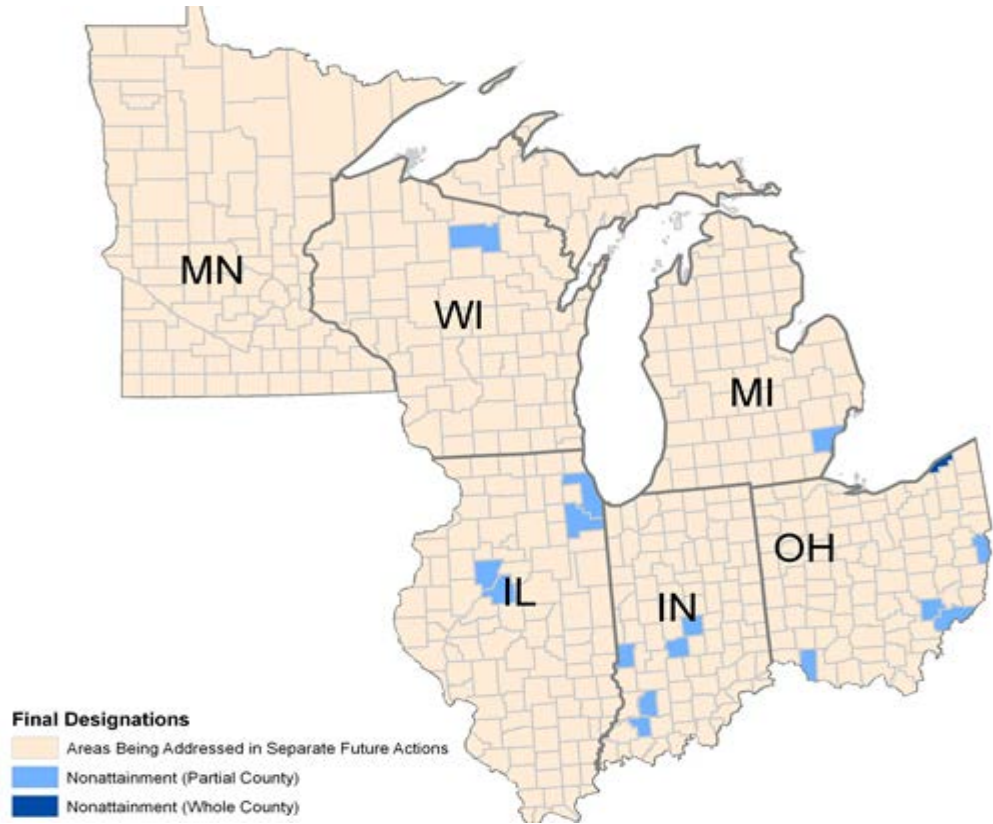
1/30/2015

Nonattainment areas are indicated by color.
When only a portion of a county is shown in color,
it indicates that only that part of the county is within
a nonattainment area boundary.

 SO2 Nonattainment Areas

Allegheny, PA
Beaver, PA
Billings, MT
Campbell-Clermont Counties, KY-OH
Central New Hampshire, NH
Detroit, MI
Hayden, AZ
Hillsborough County, FL
Indiana, PA
Indianapolis, IN
Jackson County, MO
Jefferson County, KY
Jefferson County, MO
Lake County, OH
Lemont, IL
Marshall, WV
Miami, AZ
Morgan County, IN
Muscatine, IA
Muskingum River, OH
Nassau County, FL
Pekin, IL
Rhineland, WI
Southwest Indiana, IN
St. Bernard Parish, LA
Steubenville-Weirton, OH-WV
Sullivan County, TN
Terre Haute, IN
Warren, PA

State	Area Name	Counties
Illinois	Lemont, IL	Cook (p)
		Will (p)
	Pekin, IL <small>†tangular Ship</small>	Peoria (p)
		Tazewell (p)
	Designations for the rest of the state will be addressed in a separate future action.	
Indiana	Indianapolis, IN	Marion (p)
	Morgan County, IN	Morgan (p)
	Southwest Indiana, IN	Daviess (p)
		Pike (p)
	Terre Haute, IN	Vigo (p)
Designations for the rest of the state will be addressed in a separate future action.		
Michigan	Detroit, MI	Wayne (p)
	Designations for the rest of the state will be addressed in a separate future action.	
Minnesota	Designations for entire state will be addressed in a separate future action.	
Ohio	Campbell–Clermont Counties, KY–OH	Clermont (p)
	Lake County, OH	Lake
	Muskingum River, OH	Morgan (p)
		Washington (p)
	Steubenville, OH–WV	Jefferson (p)
Designations for the rest of the state will be addressed in a separate future action.		
Wisconsin	Rhineland, WI	Oneida (p)
	Designations for the rest of the state will be addressed in a separate future action.	



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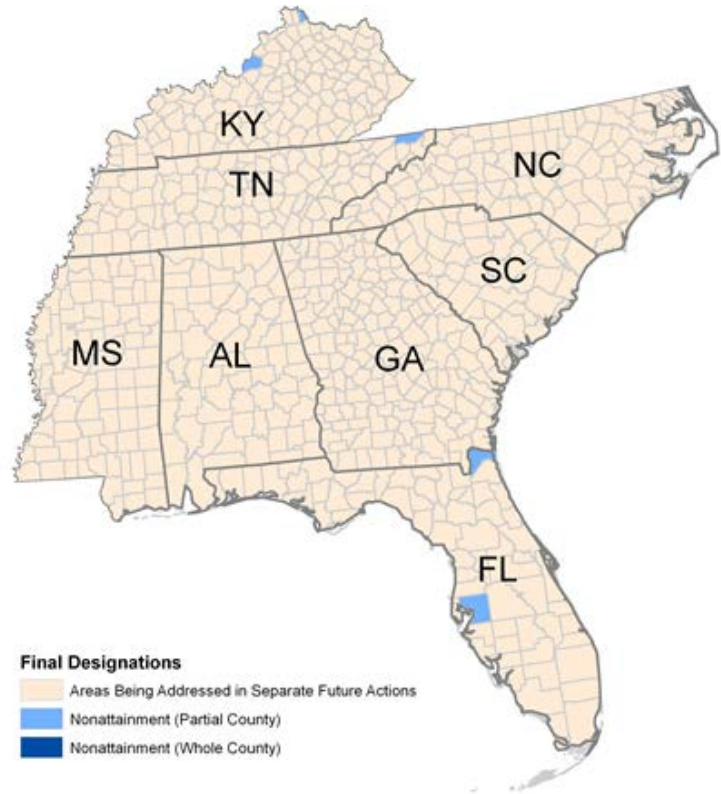
SO₂ Attainment Plans

Ohio EPA has proposed its attainment plans

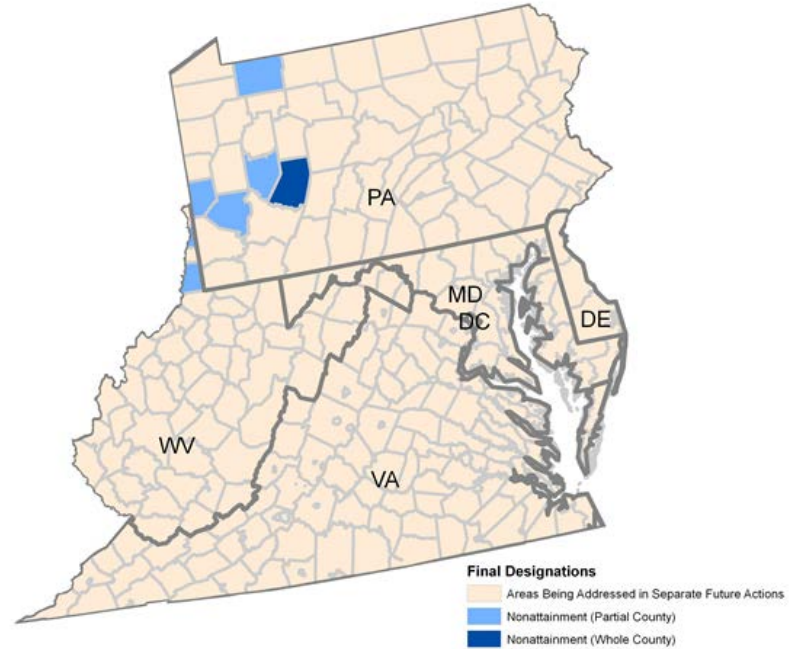
- Lake County
 - Eastlake EGU – shutdown 4/16/15
 - Painesville Muni – new limits
 - Overall Inventory Reduced - 52,155 tons (2011) to 3,322 (2018)
- Muskingham
 - Muskingham EGU shutdown June 2015
 - Overall Inventory Reduced – 105,318 tons (2011) to 1,204 (2018)
- Steubenville
 - Cardinal EGU installed FGD on all of its boilers
 - Overall Inventory Reduced – 25,409 tons (2011) to 10,930 (2018)



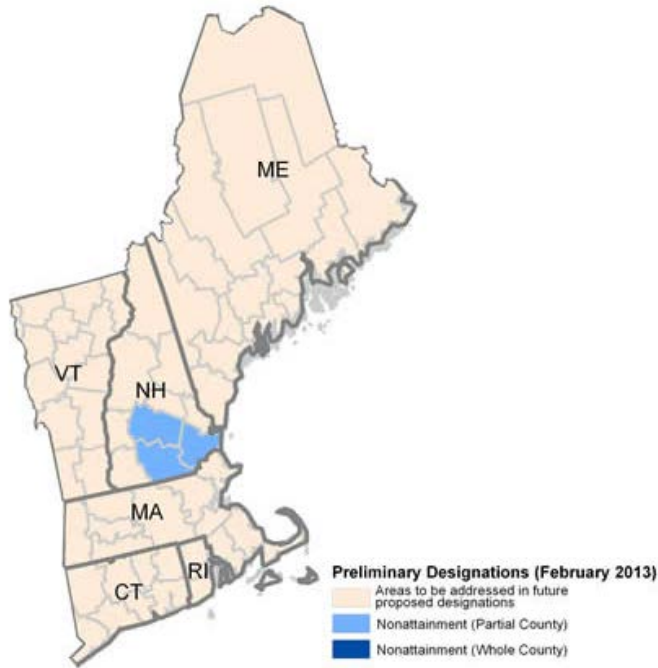
State	Area Name	Counties
Alabama	Designations for entire state will be addressed in a separate future action.	
Florida	Hillsborough County, FL	Hillsborough (p)
	Nassau County, FL	Nassau (p)
	Designations for the rest of the state will be addressed in a separate future action.	
Georgia	Designations for entire state will be addressed in a separate future action.	
Kentucky	Campbell–Clermont Counties, KY–OH	Campbell (p)
	Jefferson County, KY	Jefferson (p)
	Designations for the rest of the state will be addressed in a separate future action.	
Mississippi	Designations for entire state will be addressed in a separate future action.	
North Carolina	Designations for entire state will be addressed in a separate future action.	
South Carolina	Designations for entire district will be addressed in a separate future action.	
Tennessee	Sullivan County, TN	Sullivan (p)
	Designations for the rest of the state will be addressed in a separate future action.	



State	Area Name	Counties
Delaware	Designations for entire state will be addressed in a separate future action.	
Maryland	Designations for entire state will be addressed in a separate future action.	
Pennsylvania	Allegheny, PA	Allegheny (p)
	Beaver, PA	Beaver (p)
	Indiana, PA	Armstrong (p)
		Indiana
	Warren, PA	Warren (p)
Designations for the rest of the state will be addressed in a separate future action.		
Virginia	Designations for entire state will be addressed in a separate future action.	
District of Columbia	Designations for entire district will be addressed in a separate future action	
West Virginia	Steubenville, OH-WV	Brooke (p)
	Marshall, WV	Marshall (p)
Designations for the rest of the state will be addressed in a separate future action.		



New Hampshire SO₂ Nonattainment



Merrimack Station

Installed FGD

Emissions 2011

22,420 tons

Emissions 2014

1,044 tons

2010 Design Value 193 ppb

2012 99th Pct. Value 27ppb

2010 SO₂ NAAQS

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SO₂ Designations to be completed by 7/2/16

Top 15 sources

1. Big Brown (TX) 60,681 tons (1.59 lbs/MMBtu)
2. Rockport (IN) 54,390 (0.58)
3. Clifty Creek (IN) 52,839 (1.77)
4. Monroe (MI) 49,151 (0.62)
5. Martin Lake (TX) 43,093 (0.55)
6. Scherer (GA) 42,349 (0.37)
7. Leland Olds (ND) 38,323 (2.06)
8. W A Parish (TX) 37,861 (0.49)
9. Independence (AR) 32,974
10. White Bluff (AR) 31,687 (0.59)
11. Monticello (TX) 31,447 (0.78)
12. Gen. Gavin (OH) 31,269 (0.36)
13. St. Clair (MI) 28,208 (0.94)
14. Gerald (NE) 26,438 (0.59)
15. Belle River (MI) 24,869 (0.62)



2010 SO₂ NAAQS

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SO₂ Designations to be completed 12/31/17

- State recommendations to EPA January 13, 2017
- EGUs with low utilization but high sulfur emission rates
- Large industrial sources
 - ICI boilers, cement kilns, primary Al production, etc.
- Area sources (?)
 - Low sulfur fuels

Fine Particulate Matter (PM_{2.5})

- **2006 24-hour PM_{2.5} NAAQS**
 - December 2015: Moderate Nonattainment Area Attainment Date
 - Maintenance Plans for PA
 - Knoxville, TN ?



Area Designations for the 2012 Annual PM2.5 Standard

Nonattainment areas: counties with monitors measuring a violation of the standard as well as nearby counties that contribute the problem by emitting fine particle pollution, or pollutants that form it.

State	Area Name	EPA Designated Nonattainment Counties
CA	Imperial County, CA	Imperial, CA (p)
	San Joaquin Valley Air Basin, CA	Fresno, CA
		Kern, CA (p)
		Kings, CA
		Madera, CA
		Merced, CA
		San Joaquin, CA
		Stanislaus, CA
	Tulare, CA	
Los Angeles-South Coast Air Basin, CA	Los Angeles, CA (p)	
	Orange, CA	
	Riverside, CA (p)	
	San Bernardino, CA (p)	
Plumas County, CA	Plumas, CA (p)	
ID	West Silver Valley, ID	Shoshone, ID (p)
OH	Cleveland, OH	Cuyahoga, OH
		Lorain, OH
PA	Delaware County, PA	Delaware, PA
	Lebanon County, PA	Lebanon, PA
	Allegheny, PA	Allegheny, PA
4 states	9 areas	13 full counties, 7 partial counties

(p) - partial counties



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Fine Particulate Matter (PM_{2.5})

- **2012 24-hour PM_{2.5} NAAQS**
 - December 2015: Infrastructure (“Good Neighbor”) SIP Due
 - June 2016: Attainment Demonstration SIP Due
 - Need to coordinate with PA and OH
 - TN (deferred)
 - KY, IL, IN, MO (unclassifiable).
 - December 2021: Attainment Date – Moderate



Mercury and Air Toxics (MATS) Rule

- For existing and new coal-fired EGUs, numerical emission limits for Hg, PM (surrogate for toxic non-mercury metals), and HCl (surrogate for toxic acid gases).
- For existing and new oil-fired EGUs, numerical emission limits for PM (surrogate for all toxic metals), HCl, and HF.
 - EGUs may also show compliance with the HCl and HF limits by limiting the moisture content of their oil.



Mercury and Air Toxics (MATS) Rule

- Alternative numeric emission standards, including SO₂ (alternate to HCl), individual non-mercury metal air toxics (alternate to PM), and total non-mercury metal air toxics (alternate to PM) for certain subcategories of power plants.
- Bottom line – lots of scrubbers and shutdowns IF:
 - Under Supreme Court review whether the EPA “unreasonably refused to consider costs” when it determined that it was appropriate to regulate hazardous air pollution from power plants.
 - Answer coming this summer (?)



RICE MACT

This rule will reduce emissions of toxic air pollutants from existing gas-fired stationary reciprocating internal combustion engines (RICE).

When this rule is fully implemented, EPA estimates that emissions from these engines will drop by approximately:

- ◆ 6,000 tons per year (tpy) of air toxics,
- ◆ 96,000 tpy of nitrogen oxides,
- ◆ 109,000 tpy of carbon monoxide, and
- ◆ 31,000 tpy of volatile organic compounds



Clean Power Plan

- 111(d) Clean Power Plan (CO₂)- cut carbon pollution from power sector by 30% from 2005 levels
- EPA's proposal will also cut pollution that leads to soot and smog by over 25 percent in 2030.
 - ~ August 2015 EPA Final Rule
 - ~ August 2016 State Plan Submittal
 - ~ August 2017 Plan Submittal (1-yr extension)



Table 4-10. Emission Reductions of Criteria Pollutants for the Proposed EGU GHG Existing Source Guidelines in 2020 (thousands of short tons)*

Region	SO ₂	All-year NO _x	Ozone-Season NO _x	Directly emitted PM _{2.5} (EC+OC)	Directly emitted PM _{2.5} (crustal)
Option 1 - State					
East	311	315	135	5	41
West	25	51	22	<1	4
California	<1	1	1	N/A	N/A
National Total	335	367	157	6	45
Option 1 - Regional					
East	279	305	130	5	41
West	10	32	13	0	3
California	2	8	3	N/A	N/A
National Total	292	345	146	6	44
Option 2 - State					
East	247	240	101	4	35
West	20	40	18	<1	3
California	<1	1	1	N/A	N/A
National Total	267	281	119	5	38
Option 2 - Regional					
East	234	235	97	4	33
West	8	25	11	<1	2
California	2	8	3	N/A	N/A
National Total	244	268	111	5	36

*All emissions shown in the table are rounded, so regional emission reductions may appear to not sum to national total.

2008 and 2015 Ozone NAAQS

- Co-benefits to apply to RH SIP
- 2008 NAAQS Moderate SIPs due January 2017
- Ozone control programs to benefit RH
 - Cross-State Air Pollution Rule Updates
 - Distributed Generation
 - Peaking Unit Controls – High Electric Demand Days
- 2015 NAAQS SIP due late-2020



Year-round NO_x Control Opportunities

- Are we going to take on any regional controls?
 - First, need to assess what the above will get us.
 - Lots of talk about operating NO_x controls during the ozone season – doesn't do much for haze. Winter NO_x controls are effective for haze.
- Class I areas need to lead the charge



Modeling/Inventory Issues

- What is OTC Modeling Committee doing?
- NY- working on 2011 inventory
- MD- working on 2017 ozone inventory
- NJ- working on 2028 inventory



Key Source Categories

- EGUs
- Industrial, Commercial, Institutional Boilers
- Reciprocating Engines & Turbines
- Ammonia Emissions from Agricultural Sources
- Mobile Sources
- Cement Plants
- Glass Manufacturing Plants
- Lime Manufacturing Plants
- Oil Refineries/Cracking Plants
- Residential wood combustion
- Are these still relevant? Others?



Consultation/Review Process

- MANE-VU Board Meeting
 - Fall 2015
- Formal discussions with other RPOs
- Formal discussions with FLMs
- Public review process
 - FLMs
 - Internal SIP processes (including electronic submittal of document)
 - EPA process

Thank You

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