

OTC /MANE-VU Committees Meeting

April 11, 2017

Washington, DC

Ali Mirzakhali, P.E.
Stationary and Area Sources Committee



OZONE TRANSPORT COMMISSION

Stationary and Area Sources Committee

- Finalized Work Products Forwarded to EPA on Feb. 13, 2017, posted on OTC website:
 - ✓ White Paper on NO_x Controls
 - ✓ White Paper on HEDD units
- Comment Letters to EPA on 2015 O₃ NAAQS:
 - ✓ Proposed Implementation Rule: Nonattainment Area Classifications & State Implementation Plan Requirements – Feb. 13, 2017
 - ✓ NODA on Preliminary Interstate Ozone Transport Modeling Data – Apr. 6, 2017
- Workgroups Progress in Fulfilling 2017 SAS Charges:
 - ✓ Largest Contributors (EGUs)
 - ✓ High Electricity Demand Days (HEDD)
 - ✓ Control Measures

White Paper: Control Technologies and OTC State Regulations for Nitrogen Oxides (NOx) Emissions from Eight Source Categories

(finalized February 2017)

A Compendium of State NOx Emissions Controls & Regulations for:

Source Categories	Emissions Control Technologies		
<ol style="list-style-type: none"> 1. Industrial/Commercial/Institutional (ICI) Boilers 2. Stationary Gas (Combustion) Turbines 3. Stationary Internal Combustion (IC) Engines 4. Municipal Waste Combustors (MWCs) 5. Cement Kilns 6. Hot Mix Asphalt Production Facilities 7. Glass Furnaces 8. Natural Gas Pipeline Compressors 	<p><u>Combustion Modification</u></p> <ul style="list-style-type: none"> • Low Excess Air (LEA) or Reducing O₂ levels • Lean Combustion • Staged Combustion • Low Nitrogen Fuel Oil • Flue Gas Recirculation (FGR) • Low-NOx Burner (LNB) & Overfire Air (OFA) • Wet controls 	<p><u>Post-Combustion Modifications</u></p> <ul style="list-style-type: none"> • Gas Reburn • Non-Selective Catalytic Reduction (NSCR) • Selective Catalytic Reduction (SCR) • Selective Non-Catalytic Reduction (SNCR) 	<p><u>Other Control Strategies</u></p> <ul style="list-style-type: none"> • Combustion Tuning & Optimization • Use of Preheated Cullet in Glass Manufacture

White Paper: Examining the Air Quality Effects of Small EGUs, Behind the Meter Generators, and Peaking Units during High Electric Demand Days

(finalized November 2016)

	Small EGUs (<25 MW not in CAMD)	BUGs	Peaking Units (EGUs >25 MW in CAMD)
Potential Peak Ozone Contribution	5 ppb	1 ppb	~184 tons (Potential Peak Day NOx Emissions in OTR)
Recommendations	Incorporate improved temporal profiles into photochemical modeling platforms - Completed	States doing well in regulating BUGs, but room for improvement	Where not done so already, adopt NOx RACT for gas & oil combustion turbines; Pursue rulemaking or other mechanisms to ensure that all EGU types meet their best historic NOx rates at all times during the ozone season; Pursue HEDD-based rules (e.g. New Jersey's HEDD Rule).

Possible Future Study Topics:

- HEDD-based rules
- Rules or limits based around forecasted high ozone-potential days

Work Described in White Papers → Current Work by SAS Workgroups → Recommendations & Model Rules → Consider in GN SIPs Due in 2018?

Current Considerations	HEDD	Largest Contributors	Control Measures
Source Categories & Geography	<ul style="list-style-type: none"> • boilers serving EGUs • ICI boilers • simple cycle or combined cycle combustion turbines • landfill/digester gas-fired reciprocating engines • other fuel-burning equipment <p>define maximum rated capacity for each “ozone season” = May 1st through September 30th</p>	<p>Large EGUs - ≥25 MW that report to CAMD</p> <p>No Post-Combustion Controls (Uncontrolled)</p> <p>Not running existing controls optimally</p> <p>CSAPR Update states + OTR + NC</p>	<ul style="list-style-type: none"> • Natural Gas Pipeline Compressors • Cement Kilns • Paper Mills • Glass Furnaces <p>Municipal Waste Treatment & Disposal</p> <p>CSAPR Update states + OTR</p>
Control Strategies & Technologies	<p>Rule-Based Strategy - enforceable</p> <p>Outreach-Based strategy - voluntary</p>	<p>SCR & SNCR operations performance rate threshold:</p> <p>SCR = 0.10 lb/mmBTU</p> <p>SNCR = 0.30 lb/mmBTU</p>	
Fuel Type	<p>coal, gas, & residual or other oils</p>	<p>coal & residual oil</p>	<p>coal, residual oil, & natural gas</p>

OTC Comment Letters to EPA on 2015 Ozone NAAQS

Proposed Implementation Rule: Nonattainment Area Classifications & State Implementation Plan Requirements *(sent Feb. 13th, 2017)*

Issues Raised:

- Revoking 2008 Ozone NAAQS
- RFP: Baseline Year Agreement & Milestone Demonstration
- Methodology used to establish thresholds for nonattainment designation classification
- RACT SIP revision submittal, implementation deadlines, CTG *(attached OTC white paper on NOx controls)*
- SIP Certification for Non-Attainment Areas
- Inventory: HEDD *(attached OTC white paper on HEDD)*
- Nonattainment NSR Offset Requirement: Inter-pollutant Precursor Trading for Ozone Offsets
- RACM Outside Of NAA Boundaries
- International Transport and Background Ozone

OTC Comment Letters to EPA on 2015 Ozone NAAQS (Cont'd)

Notice of Data Availability (NODA) - Preliminary Interstate Ozone Transport Modeling Data (sent Apr. 6th, 2017)

Issues Raised:

- Air quality modeling under-prediction
- IPM projections
- Projections for other sectors (OTC appreciates EPA's use of MARAMA growth factors)
- Meteorology and transport patterns
- Contribution time period
- Use of projections for determining contribution
- Use of EPA modeling for states' good neighbor SIPs

Largest Contributors (EGUs) Workgroup

OTC SAS Charge, November 17, 2016:

1. Report on OTC, EPA, & individual state efforts to ensure optimal operation of existing EGU controls to ensure maximum NO_x emission reductions, focusing on EGUs in OTC modeling domain.
2. Report on OTC & individual state efforts to ensure that controls are added to large uncontrolled EGUs inside & outside of the OTR.

Progress to Date in Fulfilling Charges:

- Drafted Outline of Reports
- Analyzing status of SCR & SNCR operations (CSAPR Update TSD, State RACT)
- Reviewing available datasets (NEEDS, ERTAC, etc.)

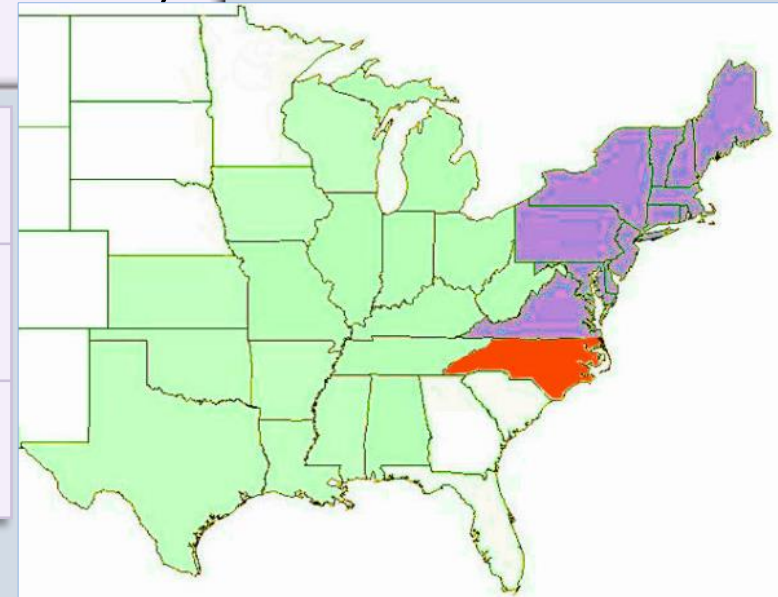
Large EGU = ≥ 25 MW that report to CAMD

EGU Fuel type = coal & residual oil

Uncontrolled EGU = having no post-combustion controls

Geography = states in CSAPR Update + OTR + NC

Metric = “potential reductions” based on performance rates per CSAPR-U:
SCR = 0.10 lb/mmBTU; SNCR = 0.30 lb/mmBTU



Top 25 2016 Ozone Season CSAPR State NOx Emitters

State	Facility Name	Facility - Unit ID	Avg. NOx Rate (lb/MMBtu)	NOx (tons)	SCR?	Best Observed Rate (lb/mmBTU)	Year
LA	Ninemile Point	1403-4	0.394	3,918			
MO	New Madrid Power Plant	2167-2	0.457	3,832	Yes	0.094	2009
IN	Rockport	6166-MB2	0.195	3,444			
OH	W H Zimmer Generating Station	6019-1	0.211	3,061	Yes	0.056	2006
MO	New Madrid Power Plant	2167-1	0.709	3,000	Yes	0.090	2008
LA	Ninemile Point	1403-5	0.346	2,922			
TX	Oklunion Power Station	127-1	0.302	2,791			
AR	Independence	6641-1	0.273	2,686			
IN	Rockport	6166-MB1	0.197	2,578			
AR	Independence	6641-2	0.247	2,528			
AR	White Bluff	6009-1	0.356	2,460			
WV	Fort Martin Power Station	3943-1	0.293	2,416			
PA	Brunner Island, LLC	3140-3	0.401	2,414			
TX	Limestone	298-LM2	0.198	2,369			
IN	Cayuga	1001-2	0.296	2,320			
PA	Montour, LLC	3149-1	0.379	2,316	Yes	0.039	2005
MO	Thomas Hill Energy Center	2168-MB3	0.233	2,225	Yes	0.042	2003
PA	Montour, LLC	3149-2	0.296	2,320	Yes	0.000	0
IA	Walter Scott Jr. Energy Center	1082-3	0.379	2,316			
PA	Cheswick	8226-1	0.233	2,225	Yes	0.000	0
VA	Clover Power Station	7213-1	0.197	2,578			
WV	Harrison Power Station	3944-3	0.196	2,128	Yes	0.063	2005
MO	Thomas Hill Energy Center	2168-MB2	0.372	2,086	Yes	0.076	2004
PA	Bruce Mansfield	6094-3	0.185	2,009	Yes	0.074	2005
WV	Harrison Power Station	3944-2	0.241	2,004	Yes	0.067	2006

**Many Units with SCR
Continue to Operate above
the Best Observed Rate (BOR)**

Control Measures Workgroup

OTC SAS Charge, November 17, 2016:

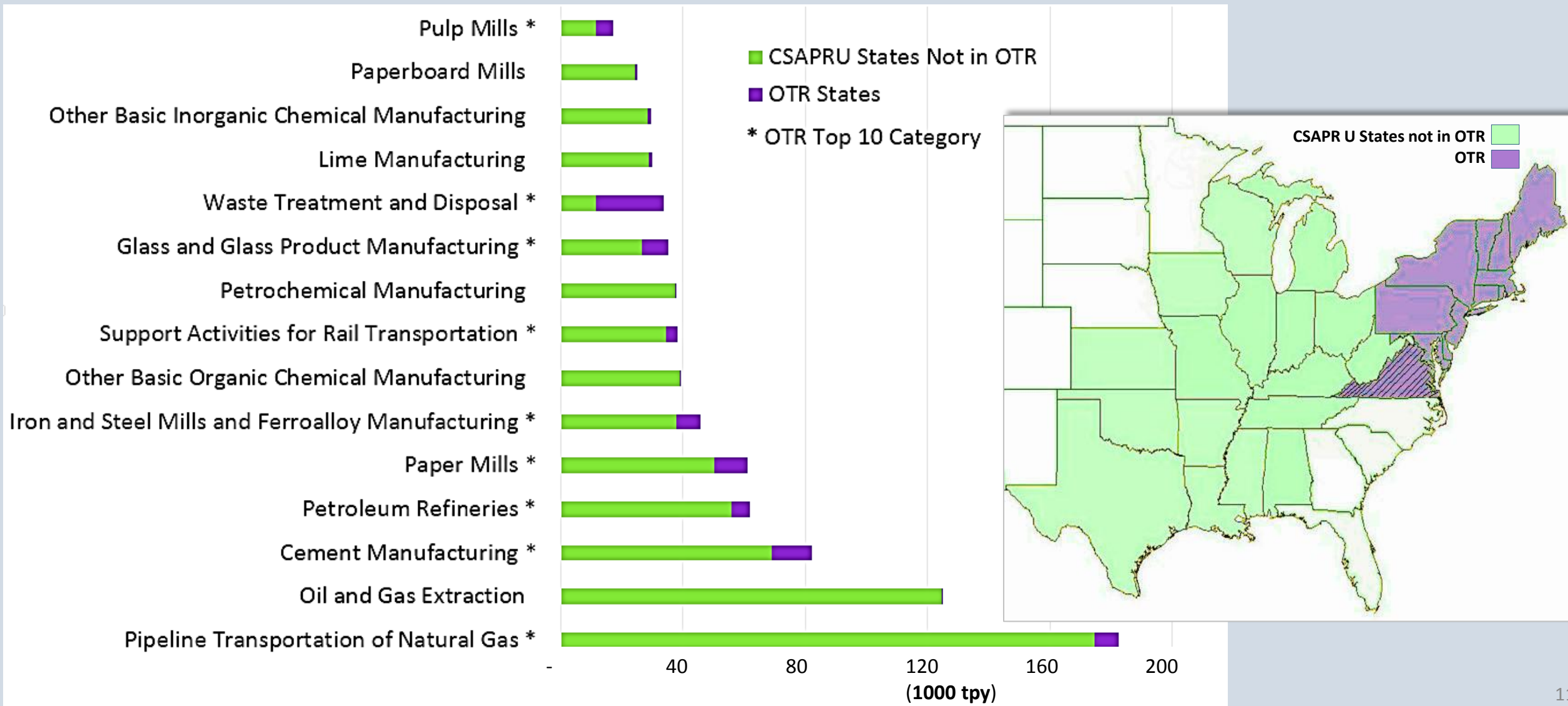
3. Develop and prioritize recommendations & model rules for stationary/area source strategies that states should consider as they develop Good Neighbor SIPs due in 2018 considering factors such as sector NO_x/VOC emissions, potential emission reductions, cost, ease of implementation, etc.

Progress to Date in Fulfilling Charge:

- Drafted Control Measures Workbook
- Identified geography: CSAPR Update & OTR States
- Identified top five NO_x source categories
- Surveyed NO_x & VOC control measures for SAS sources that OTC states are considering for inclusion in GN SIPs
- Draft analysis of 2014 NEIv1 using 5 digit NAICS codes (D. Mackintosh, EPA)
 - Top 10 Non-EGU Stationary Source Categories of NO_x in OTR (all OTC states except VA)
 - Top 15 Non-EGU Stationary Source Categories of NO_x in CSAPR Update & OTR states
- Collecting information on control costs for implementing NO_x controls, time for implementation & ease of implementation (EPA's CSAPR Update TSD for 2008 Ozone NAAQS)
- Reviewing MD information used to develop MD's AIM & Consumer Products rules

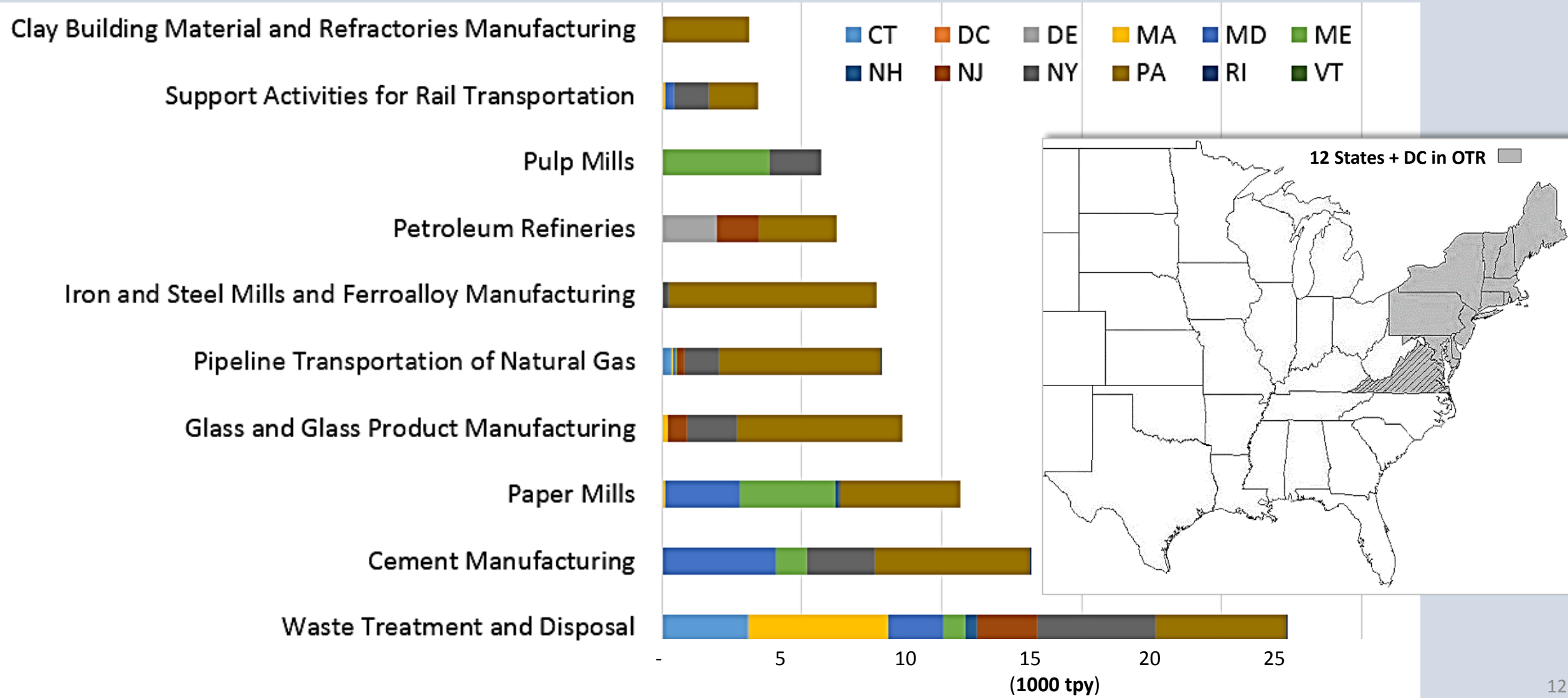
Control Measures Workgroup (Continued)

Top 15 NOx Emitting Stationary Source Categories in CSAPR Update & OTR States (Excluding EGUs, Airport LTO, & Sources from VA); Source: 2014 NEI v.1



Control Measures Workgroup (Continued)

Top 10 NOx Emitting Stationary Source Categories in OTR (Excluding EGUs, Airport LTO, & Sources from VA); Source: 2014 NEI v.1



HEDD Workgroup

OTC SAS Charge, November 17, 2016:

4. Develop recommendations for at least one specific strategy to reduce HEDD emissions & an implementation mechanism.

Progress to Date in Fulfilling Charge:

Potential strategies for implementation

- *Identify & define types of units, and the geography to focus on*
- *Quantify potential NOx emissions reductions*
- *Develop & recommend strategies for implementation*

Rule-Based Strategy

Surveyed member states on current landscape of existing and planned rules & regulations on NOx emissions control on HEDD

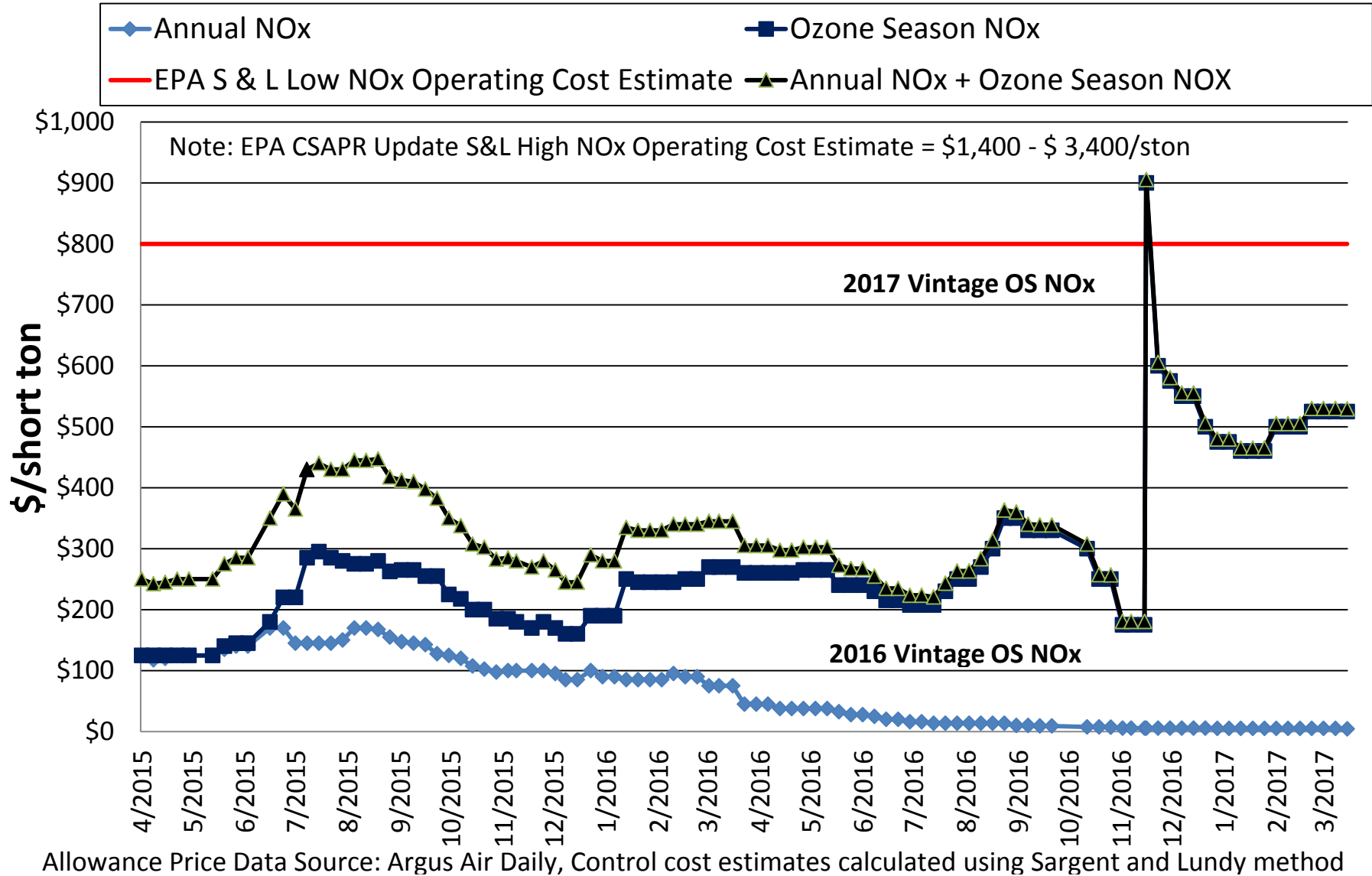
Developed a draft template for this strategy

Outreach-Based Strategy

Developing template around forecasted high ozone days and/or high electric generation days

Intended as a voluntary strategy to raise public awareness

CSAPR Allowance Prices (4/17/15 – 3/31/17)



Still Cheaper to Buy Allowances than to Run Controls in most cases!

Questions

