

OTC Annual Meeting

June 3, 2016

Hotel Palomar

Philadelphia, PA

Ali Mirzakhali, P.E.
Stationary and Area Source Committee
Update



Overview

- Review of Stationary Source Committee Charge
- Status of Committee's Deliverables for 2016 Annual Meeting



Committee Charge

Identify potential emission reduction strategies to consider at the 2016 Fall Meeting, through:

- Largest NO_x and VOC Contributor Analysis
- High Electricity Demand and Emergency Generator Information
- Reasonably Available Control Technology for NO_x and VOC

Status of Committee's Deliverables

1. ICI Boiler Whitepaper - Published Final Draft*
2. Energy Sector - continued analysis of:
 - A. Top 25 NOx emitters
 - B. EGU utilization by fuel type
 - C. HEDD
 - Back-up Generators (BUGs)
 - Smaller EGUs (<25 MW) not in CAMD
 - D. Air quality impact
 - E. CSAPR
3. Workgroup updates

ICI Boiler Workgroup Update

Finalized White Paper after Stakeholder feedback period last Fall

Conclusions from the White Paper:

- **NO_x and SO₂** decrease:

2007 - 2011	NE + VA
NO _x	↓ 22%
SO ₂	↓ 40%

- Modest **NO_x** decreases expected between 2011 - 2018:

NE	SE
↓ 5%	↓ 11%

- Percentage of annual ICI boiler **NO_x** emissions compared to all sectors:

	NE, MW, & SE	CONUS
2011	6-7%	5%
2018	9-10%	7%

Potential Next Step: Evaluation of existing state limits, and whether new limits are warranted

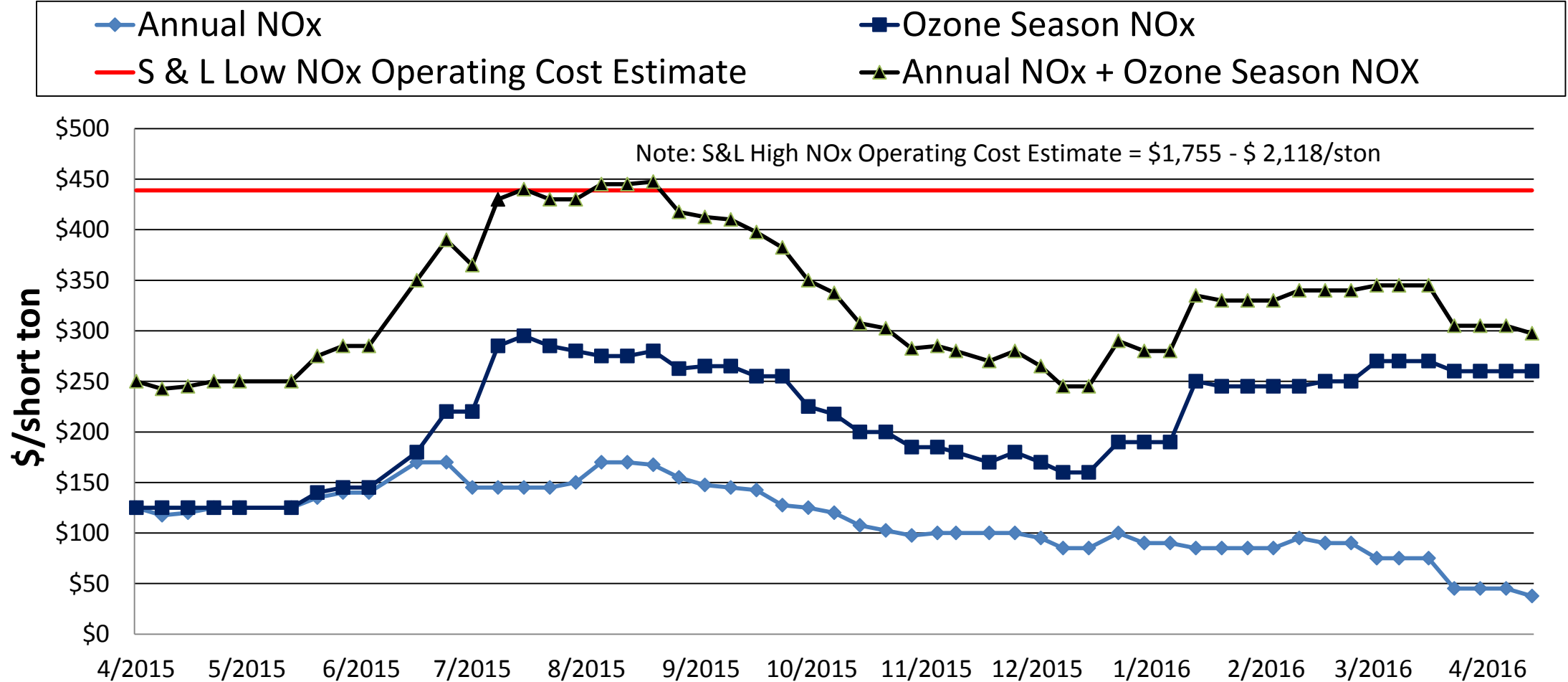
Top 25 NO_x Emitters – 2015 Ozone Season

Many Units with SCR Operating above the Best Observed Rate

State	Facility Name	Facility - Unit ID	NO _x (tons)	Avg. NO _x Rate (lb/MMBtu)	SCR?	Best Observed Rate (lb/MMBtu)	Year
IN	Rockport	6166 - MB1	3,976	0.208			
IN	Rockport	6166 - MB2	3,677	0.207			
LA	Ninemile Point	1403 - 5	3,008	0.319			
WV	Harrison Power Station	3944 - 3	2,965	0.342	Y	0.066	2005
AR	White Bluff	6009 - 1	2,898	0.276			
WV	Harrison Power Station	3944 - 2	2,855	0.364	Y	0.066	2005
LA	Ninemile Point	1403 - 4	2,717	0.343			
PA	Homer City	3122 - 1	2,624	0.351	Y	0.067	2006
OH	Avon Lake Power Plant	2836 - 12	2,617	0.396			
NC	Marshall	2727 - 4	2,460	0.272			
PA	Bruce Mansfield	6094 - 1	2,409	0.242	Y	0.076	2004
AR	White Bluff	6009 - 2	2,398	0.286			
PA	Conemaugh*	3118 - 1	2,353	0.227	Y	-	-
PA	Montour, LLC	3149 - 1	2,246	0.309	Y	0.044	2003
PA	Montour, LLC	3149 - 2	2,203	0.336	Y	0.047	2003
PA	Keystone	3136 - 1	2,198	0.232	Y	0.042	2003
WV	Harrison Power Station	3944 - 1	2,155	0.318	Y	0.063	2005
PA	Homer City	3122 - 3	2,131	0.282	Y	0.087	2005
PA	Brunner Island, LLC	3140 - 3	2,111	0.325			
PA	Conemaugh*	3118 - 2	2,012	0.200	Y	-	-
WV	Mountaineer (1301)	6264 - 1	1,979	0.108	Y	0.039	2007
AR	Flint Creek Power Plant	6138 - 1	1,970	0.264			
IN	IPL - Petersburg Generating Station	994 - 4	1,946	0.264			
PA	Keystone	3136 - 2	1,907	0.243	Y	0.043	2008
AR	Independence	6641 - 1	1,771	0.239			

*Conemaugh installed SCR in 2014; not enough data to determine Best Observed Rate.

CSAPR Allowance Prices (4/17/15 - 4/29/16)



Allowance Price Data Source: Argus Air Daily, Control cost estimates calculated using [Sargent and Lundy method](#)

Cheaper to Buy Allowances than to Run Controls!

Utilization of EGUs Based on Fuel Type

Analysis of the Utilization of Coal-Fired EGU Resources:

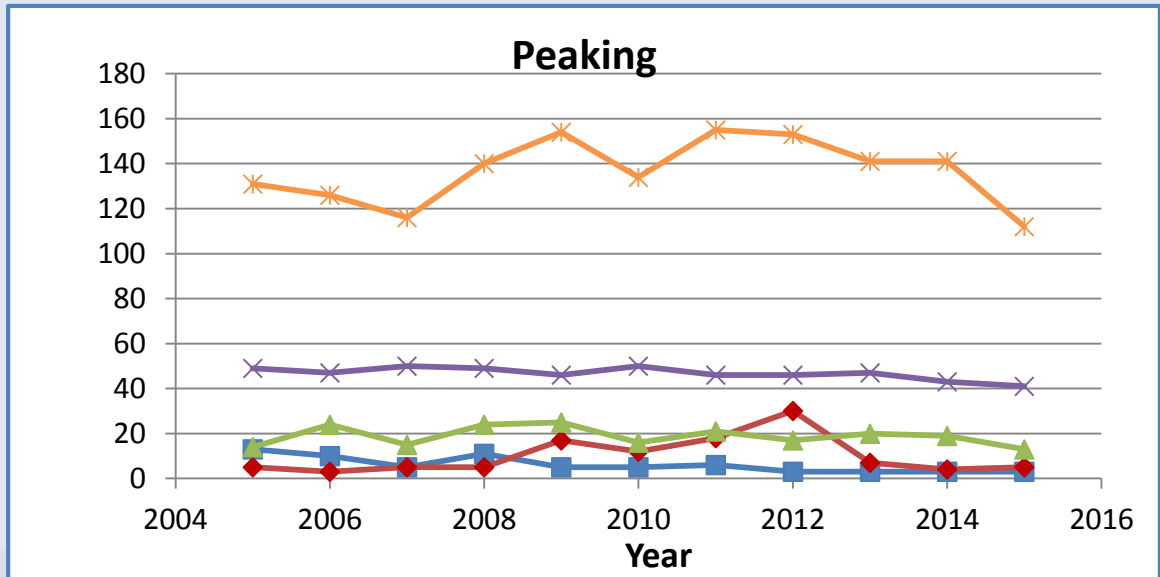
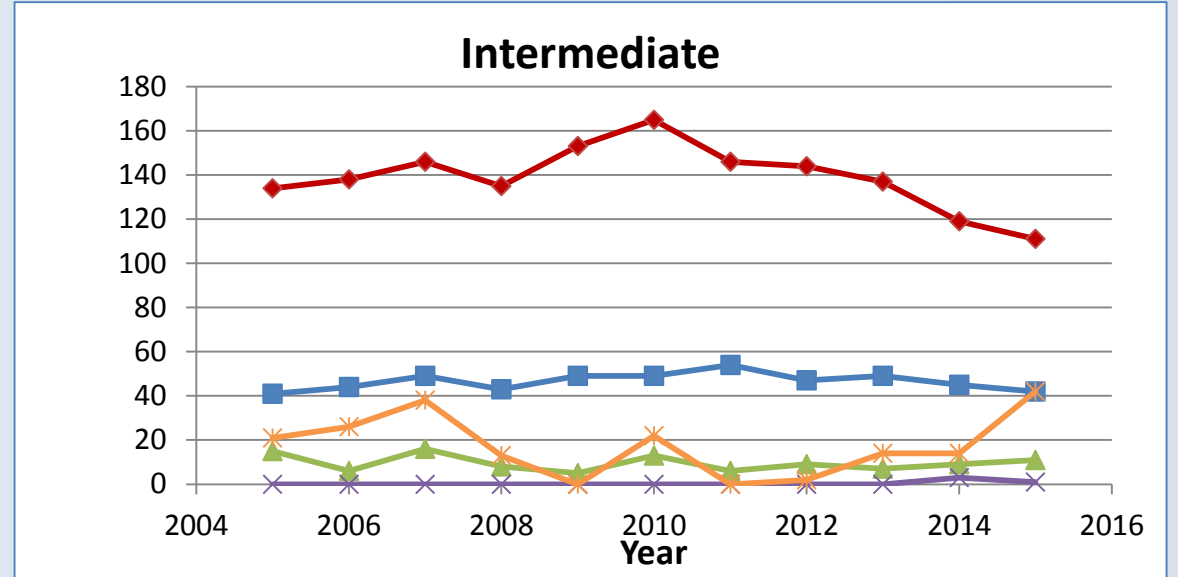
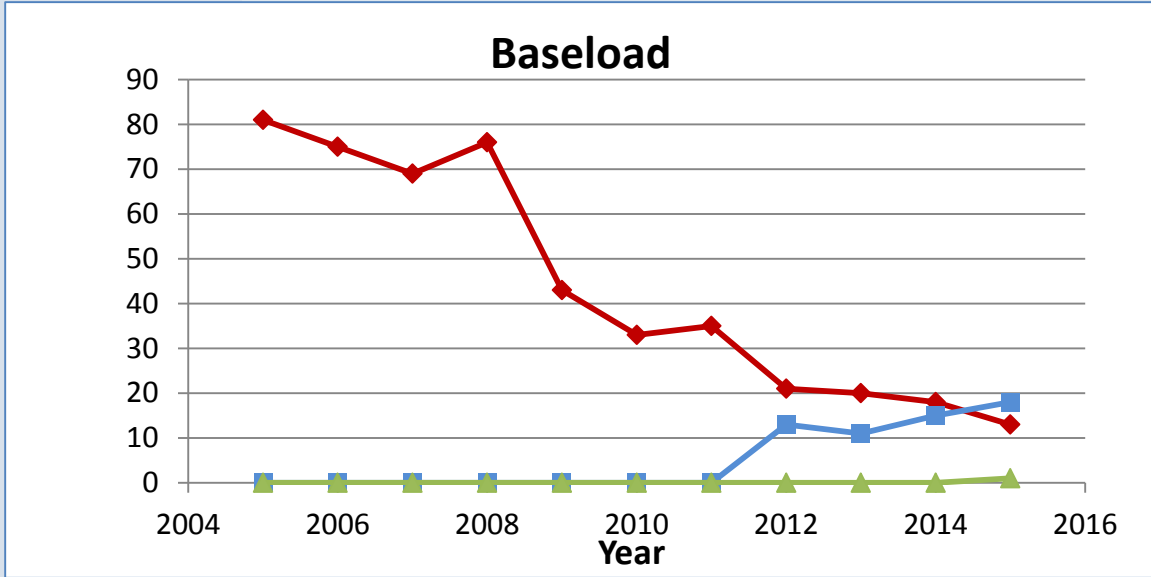
Last decade → significant shift in the makeup of the EGU fleet operating in PJM states that have been primarily served by coal-fired units.

Some contributing factors:

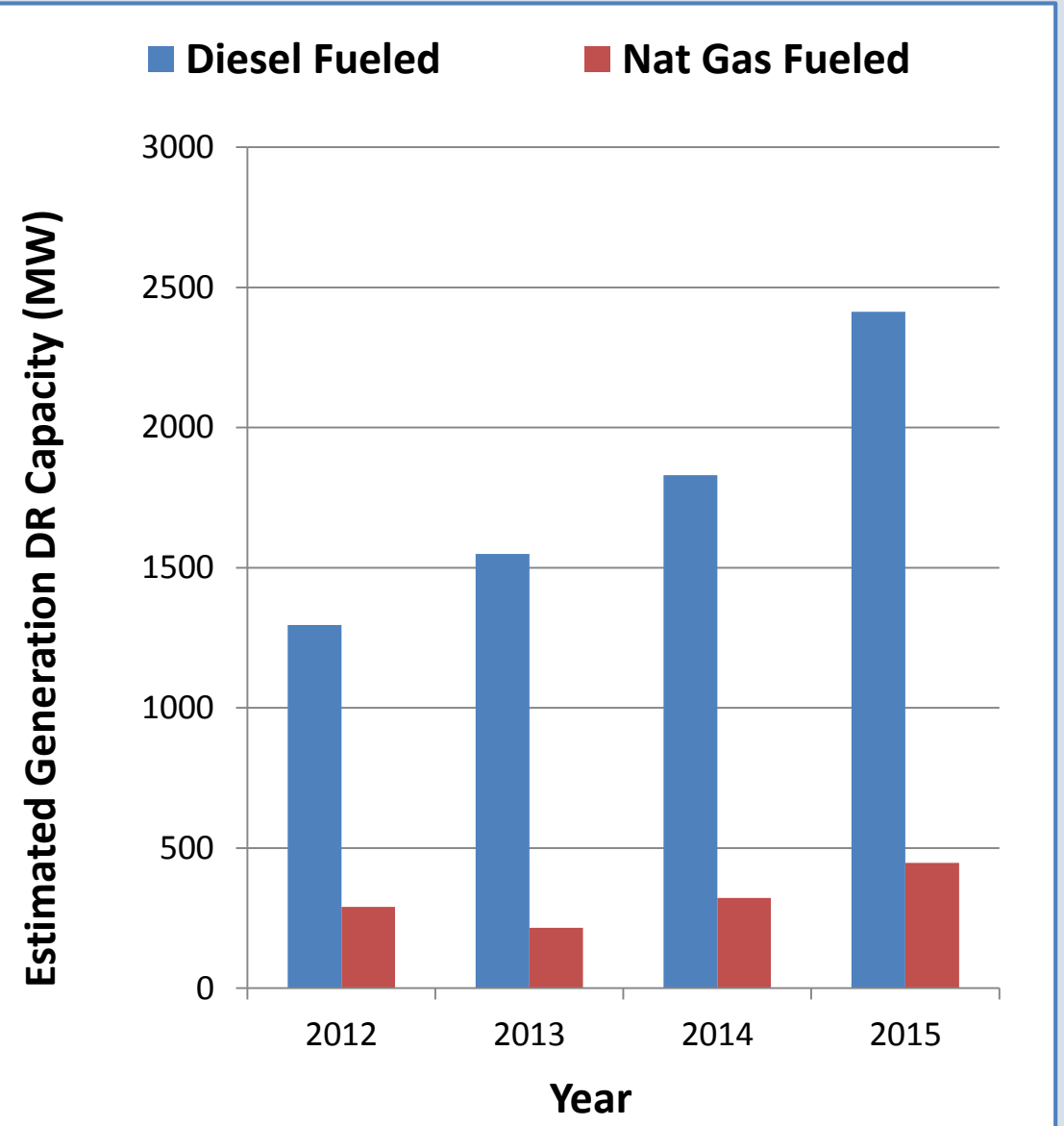
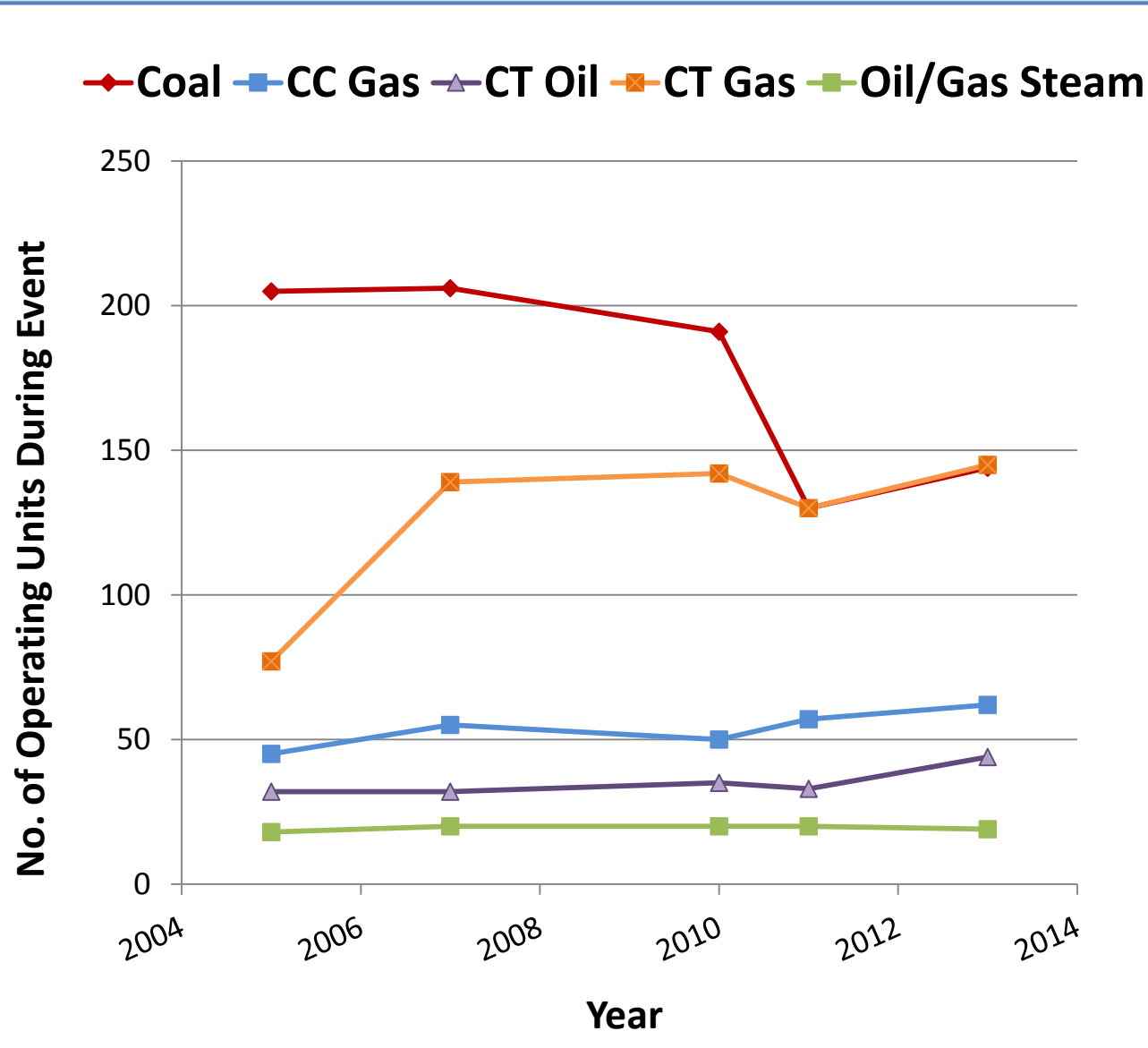
- Long term effects of deregulation
- Various environmental programs and initiatives
- Renewables requirements
- Utilization of demand response resources
- Improved availability of relatively low cost natural gas

of EGUs Operating Annually in MD-OH-PA-VA-WV

■ Gas CC
 ◆ Coal
 ▲ Oil/Gas Steam
 × Oil CT
 ✱ Gas CT



MD-OH-PA-VA-WV During PJM Demand Response Events



High Electricity Demand Days (HEDD)

On HEDD more electricity generation than usual is required for reliability

- More generation → more emissions
- Typical HEDDs are hot, humid days that are already conducive to high ozone
- Therefore the higher emissions occur at the same time as ozone conducive weather

Some emissions are not reflected properly in OTC Modeling and needed improvement

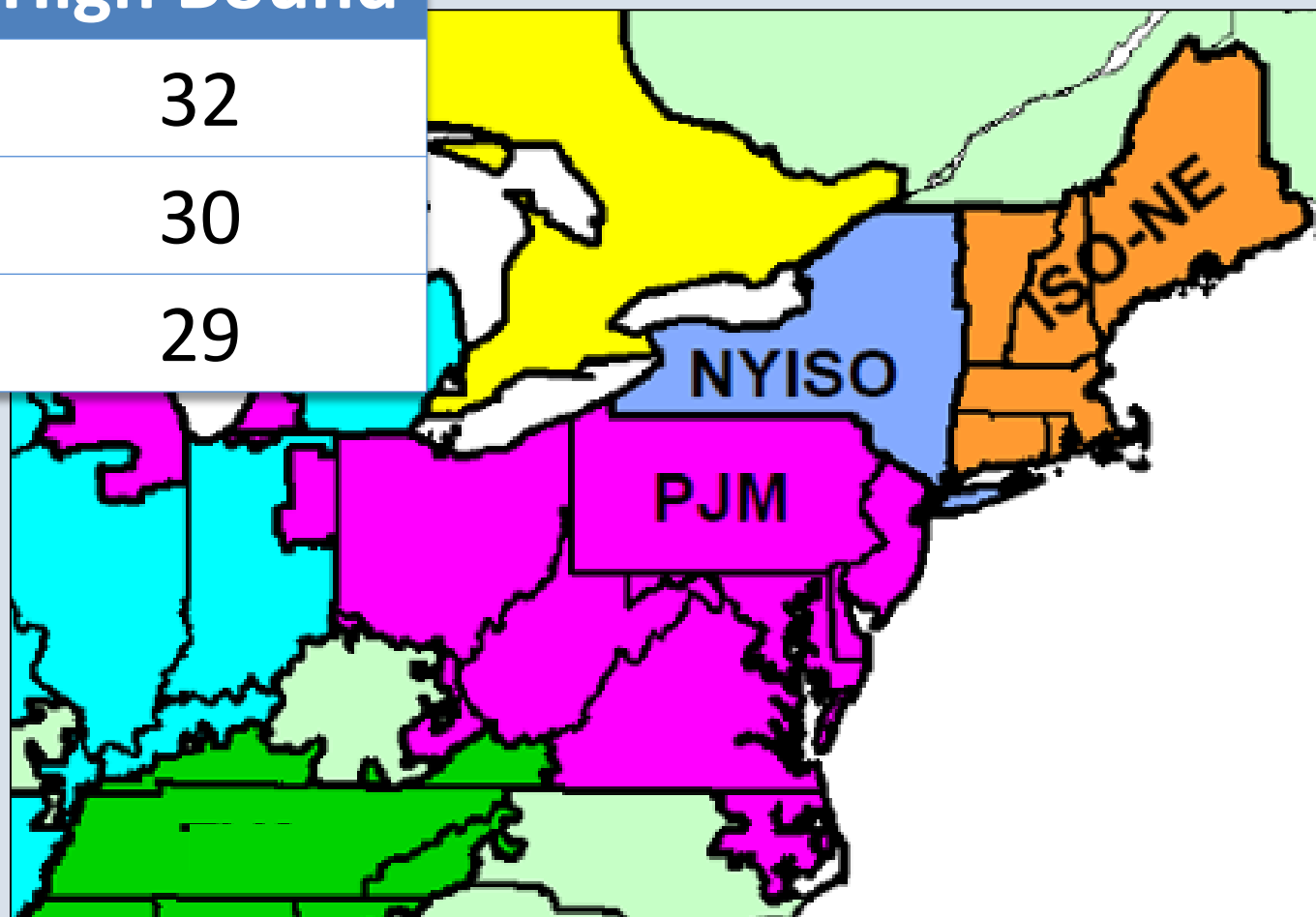
- Back-up Generators (BUGs)
- Smaller EGUs not in CAMD (<25 MW)



Emissions Estimates for BUGs

NO_x Emissions in Tons/Day (or Tons/“Event”)

Region	Low Bound	High Bound
ISO-NE	8	32
NY-ISO	7	30
PJM	7	29



Small EGU Units (<25 MW)

Typically operate for limited time during HEDDs, when larger units are offline for I/M, or to ensure grid reliability

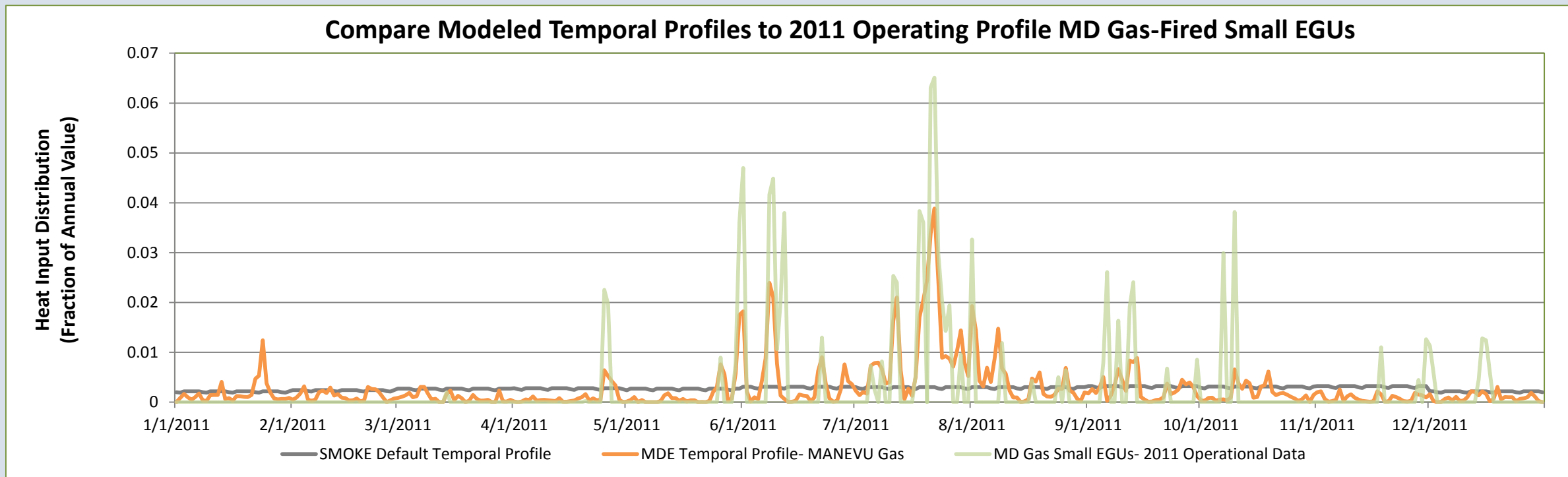
Challenge: Getting peak day emissions right with SMOKE processing

- Default temporal profiles smear emissions fairly evenly throughout the year
- Need to develop operating profiles without CEMS data

Solution: MDE developed more realistic temporal profiles for coal, oil and gas-fired Small EGUs, through:

- Changed the hourly distribution of annual emissions
- Allocated emissions based on CAMD data from peaking units slightly larger than 25 MW

Small EGUs Current Status



Completed :

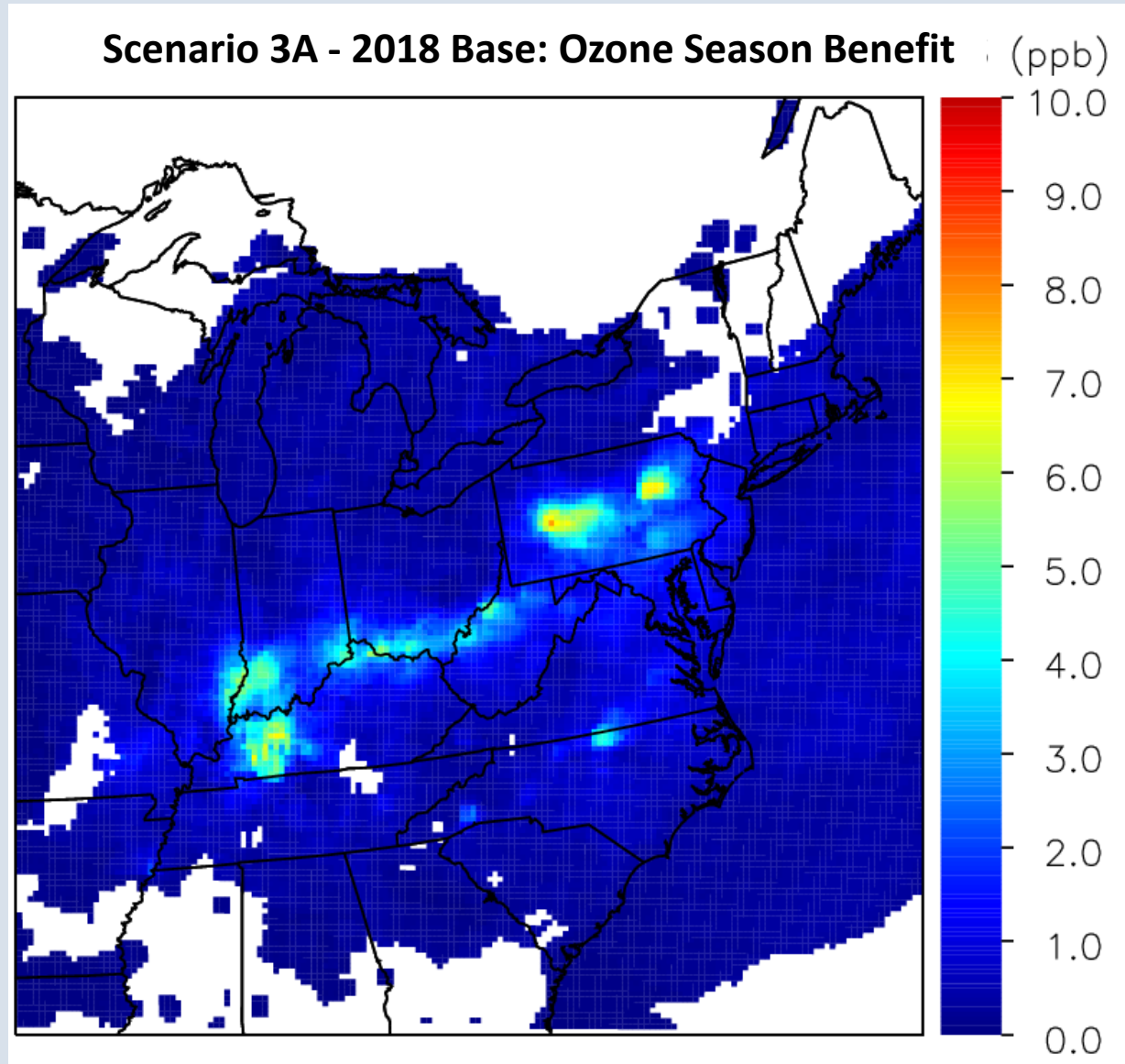
- Selected universe of small EGU units
- Held state comment period to refine list of units
- Completed 2-week July CMAQ model runs using new temporal profiles

Next Steps:

- Requested additional state comments
- Incorporate temporal profiles into Beta modeling platform

Ozone Impact of Not Running Existing Controls

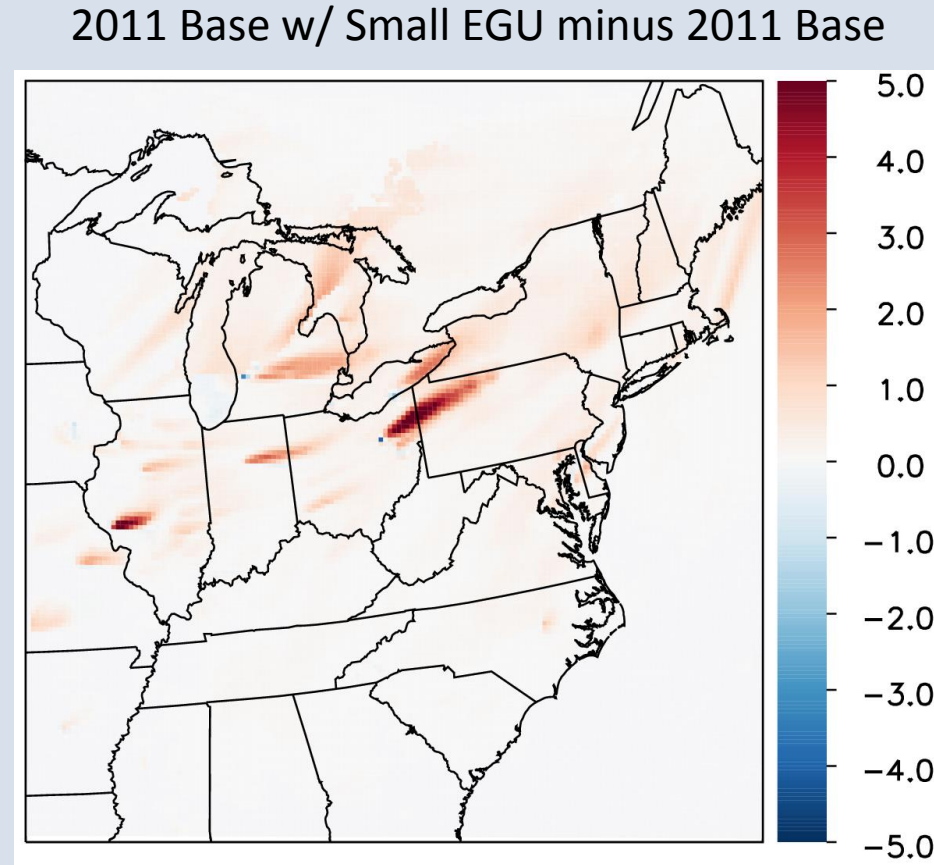
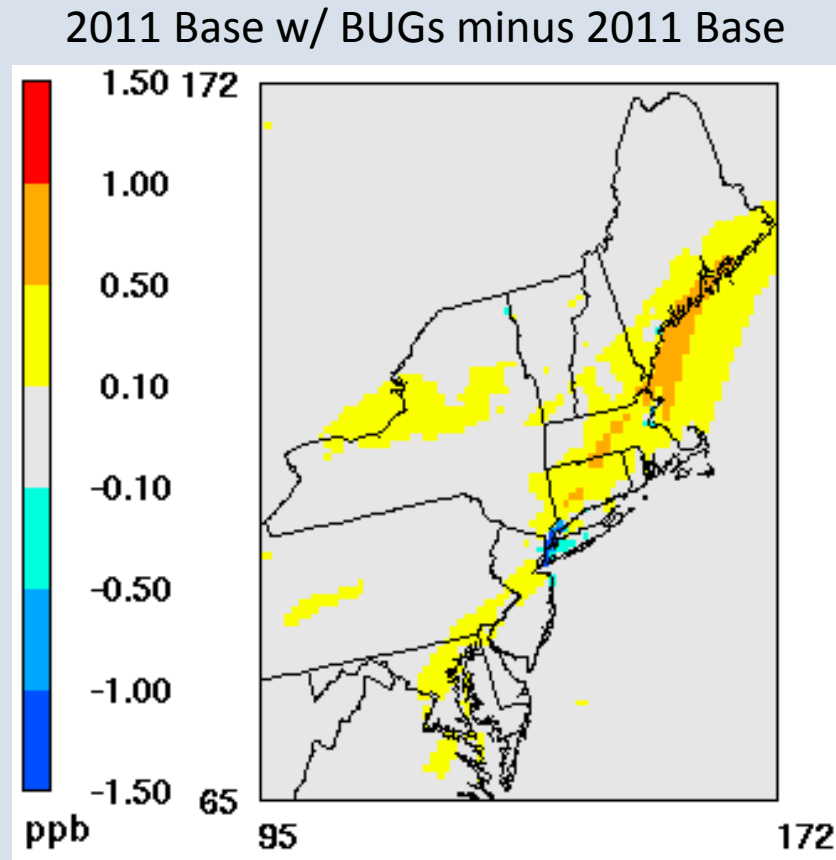
Lost Benefit of 413 Tons/Day



Ozone-Season NOx (Tons)	
Reference	175,700
3A	112,400
Difference	63,300

HEDD Example: Ozone Impact on July 21, 2011

Difference in Daily Maximum 8-hour Ozone



In some areas on HEDDs:

- BUGs can have an impact of up to **1 ppb**
- Small EGU units (<25 MW) can have an impact of up to **5 ppb**

CSAPR Updates

DC Circuit:

- 2014 O₃-season NO_x budgets for FL, MD, NJ, NY, NC, OH, PA, SC, TX, VA, and WV invalid
- Remanded to EPA without *vacatur* for reconsideration

July

2015

December

EPA:

- CSAPR update for 2008 O₃ NAAQS

OTC → EPA:

- Final rule must be published by June 2016
- Fulfill CAA statutory mandate on Good Neighbor obligations
- Ensure emissions reduction benefits by 2017

February

2016

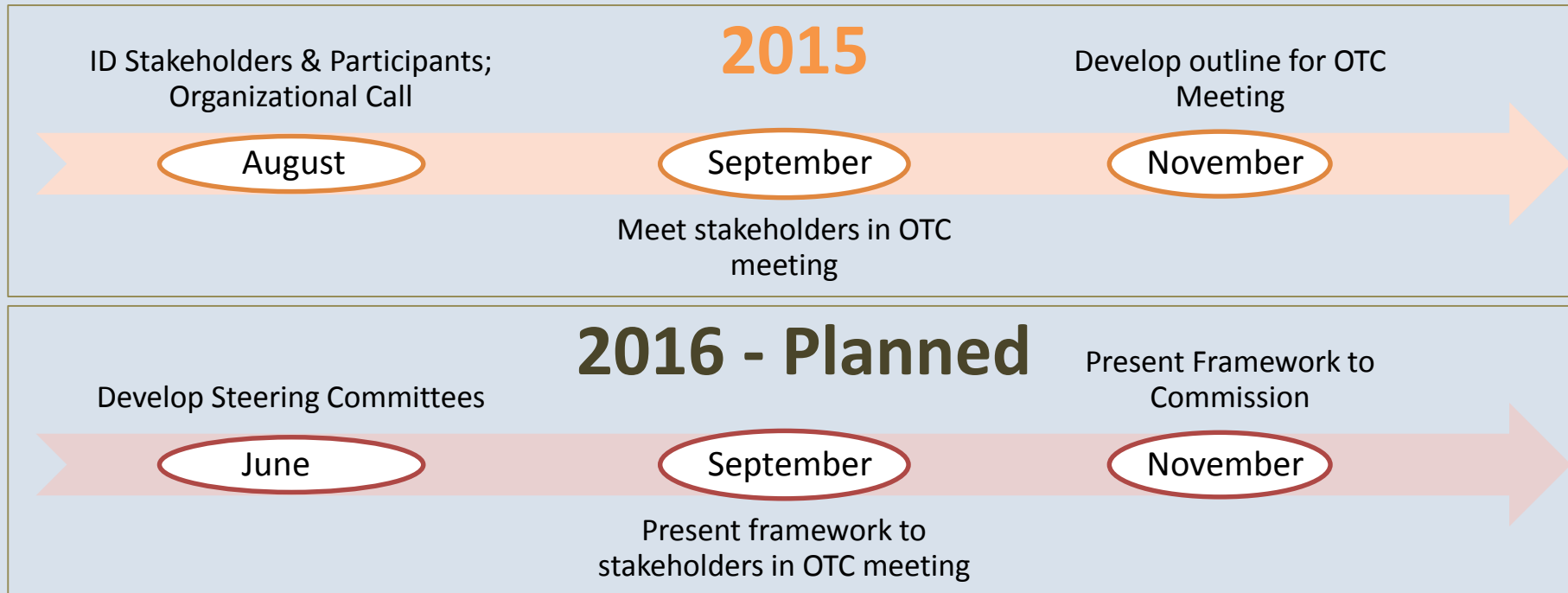
June

EPA: ???

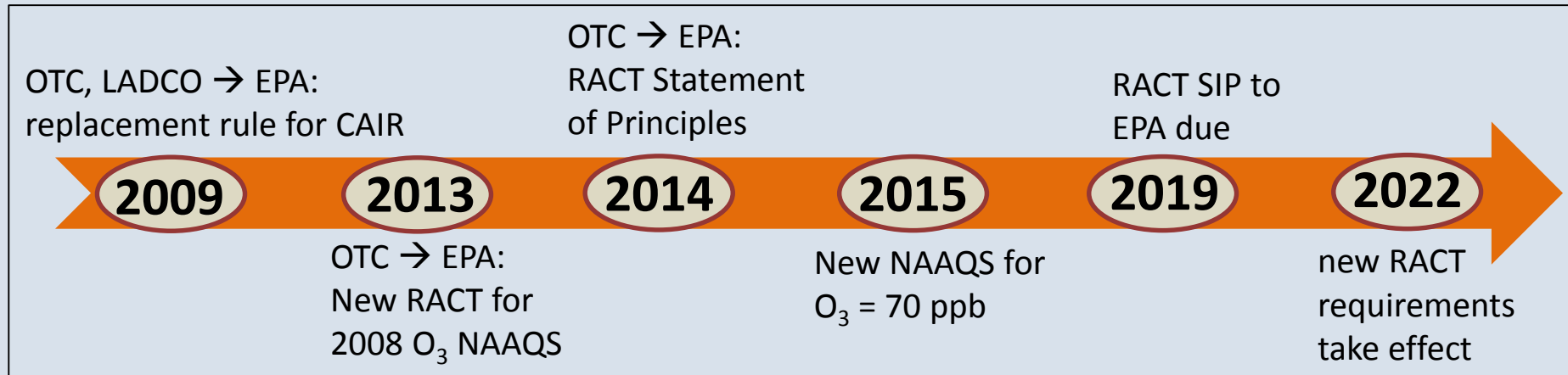
Consumer Products/AIM Update

Goal: Establish framework for a voluntary program which earns SIP credit while working with states, EPA, and industry

- National rule preferred, but EPA action is stagnant
- State by state rule adoption resource intensive and not uniform



RACT Compendium



- Compiling and evaluating each state's NO_x and VOC limits for source categories
- Reviewing CTGs
- States are in the process of providing information on their RACT SIPs for the compendium

Vapor Recovery

- MD has proposed and DE has approved regulations for Stage II programs
- Continue to improve Stage I



Questions?

