



Control Strategy Development Process and Status

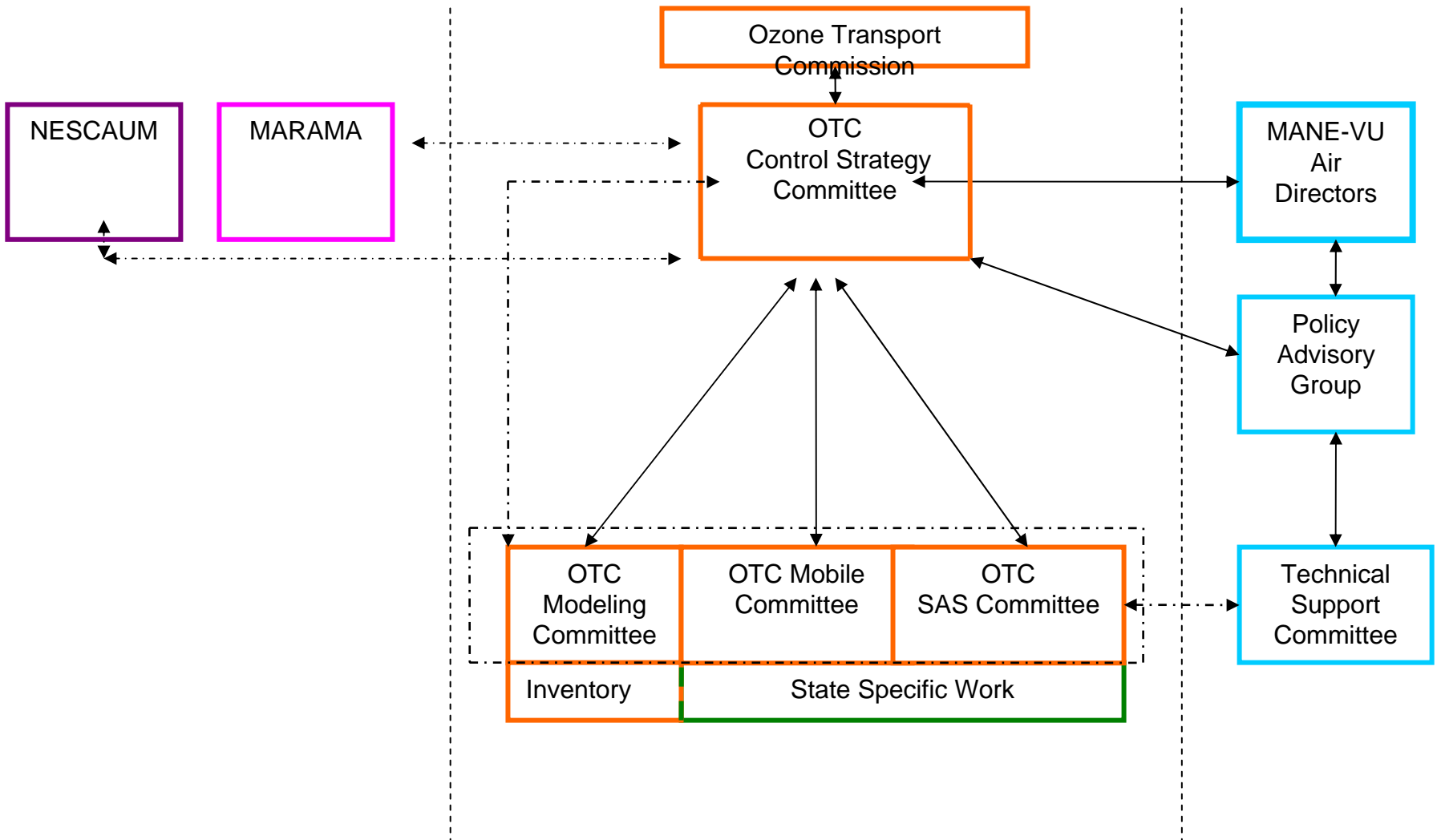
Control Strategy Committee Meeting

*January 24, 2006
Embassy Suites, BWI*





Organization and Coordination





OTC Control Strategy Work

- Multi-Pollutant Program Development
 - EGU and ICI Boilers
 - Intra- and Inter-Regional Coordination
- Control Measure Analysis and Development
 - RACT Update - 16 Plus fruitful categories
 - RACT Benchmark – ID Most Stringent in OTR
 - Identification of New Measures
- Corridor Approach to Diesel/Auto Emissions

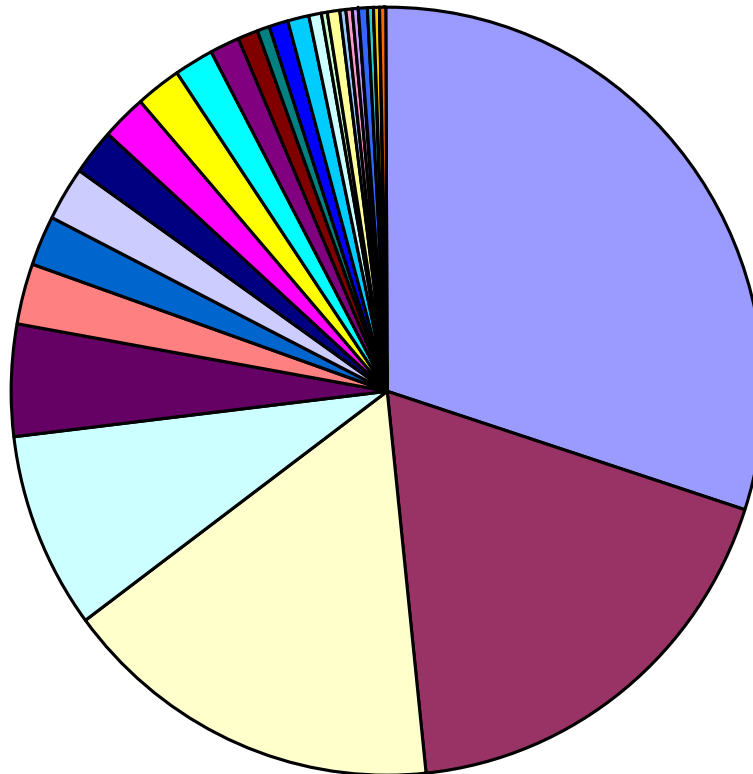


Sources of Information

- Multiple State Initiatives
 - State Staff Leads on State Specific Work
 - Workshops
 - Other State Activities/ Workgroup Consultations
 - Intra and Inter-Regional Coordination
- Stakeholder Input, Meetings w/ Key Organizations
- MARAMA RACT Update
- STAPPA Menu of Options
- NESCAUM and MARAMA Diesel Collaboratives
- Contractor Assistance
- Modeling Results

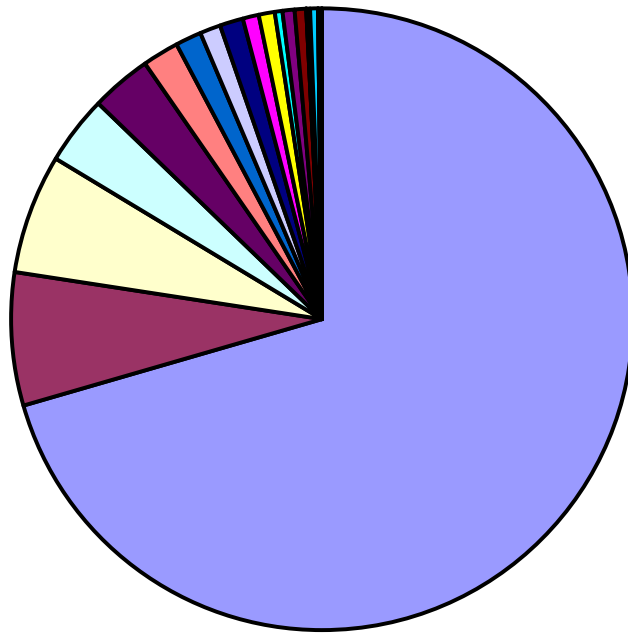


Summary of Annual NOx Emissions (2002, MANE-VU)



- Mobile Sources-Highway Vehicles-Gasoline
- Mobile Sources-Highway Vehicles-Diesel
- External Combustion Boilers-Electric Generation
- Mobile Sources-Off-highway Vehicle Diesel
- Stationary Source Fuel Combustion-Residential
- Stationary Source Fuel Combustion-Commercial/Institutional
- Industrial Processes-Mineral Products
- External Combustion Boilers-Industrial
- Mobile Sources-Railroad Equipment
- Mobile Sources-LPG
- Mobile Sources-Marine Vessels, Commercial
- Stationary Source Fuel Combustion-Industrial

Summary of Annual SO₂ Emissions (2002, MANE-VU)



- External Combustion Boilers-Electric Generation
- External Combustion Boilers-Industrial
- Stationary Source Fuel Combustion-Residential
- Stationary Source Fuel Combustion-Commercial/Institutional
- Stationary Source Fuel Combustion-Industrial
- Industrial Processes-Mineral Products
- Mobile Sources-Off-highway Vehicle Diesel
- Mobile Sources-Highway Vehicles-Gasoline
- Mobile Sources-Marine Vessels,



Most Promising Areas to Model

Based on 2002 Inventory and 2009 Projections

- Point Sources:
 - Industrial, Commercial and Institutional Boilers
 - Cement Kilns
 - Lime Kilns
 - Municipal Waste Combustion
 - Petroleum Refining
 - EGU Peaking Units
 - Small Diesel Generation



Most Promising Areas to Model

Based on 2002 Inventory and 2009 Projections

- **Area Sources:**

- Residential Coal
- Residential Wood
- Open Burning
- Cutback Asphalt
- Architectural, Traffic Markings, Industrial Maintenance Coatings
- Consumer Products
- POTWs
- Degreasing
- Printing and Graphic Arts
- Metal Production
- Stage 1 Vapor Recovery
- Adhesives
- Auto Refinishing



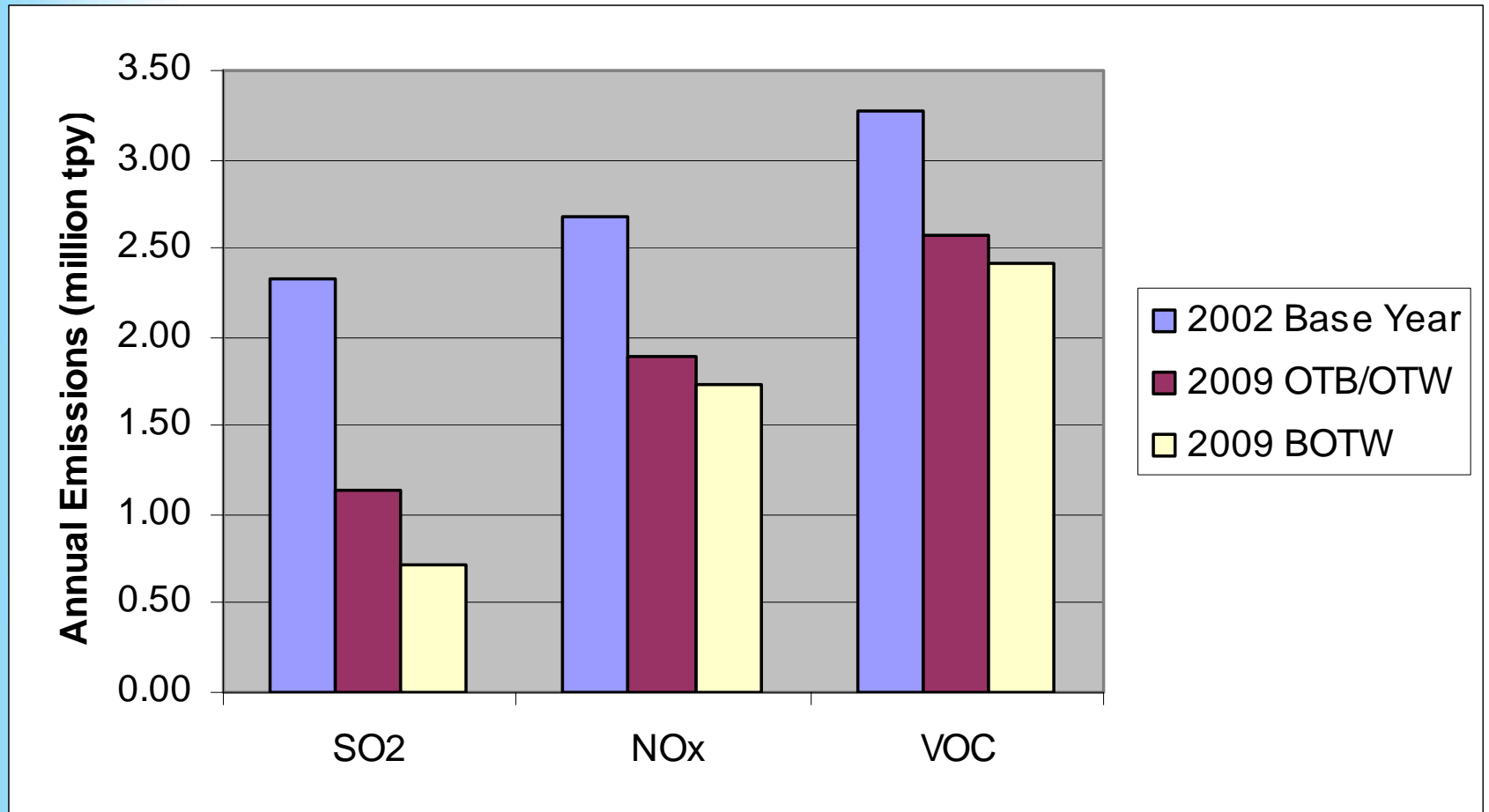
Most Promising Areas to Model

Based on 2002 Inventory and 2009 Projections

- **Mobile Sources:**
 - Onroad Gasoline Vehicles
 - Onroad Heavy Duty Diesel Vehicles
 - Onroad Heavy Duty Diesel Buses
 - Nonroad Gasoline Equipment
 - Marine and Locomotive
 - Airport Passenger and Aircraft Service Equipment
 - Off Highway LPG



Control Measure Reduction Estimates

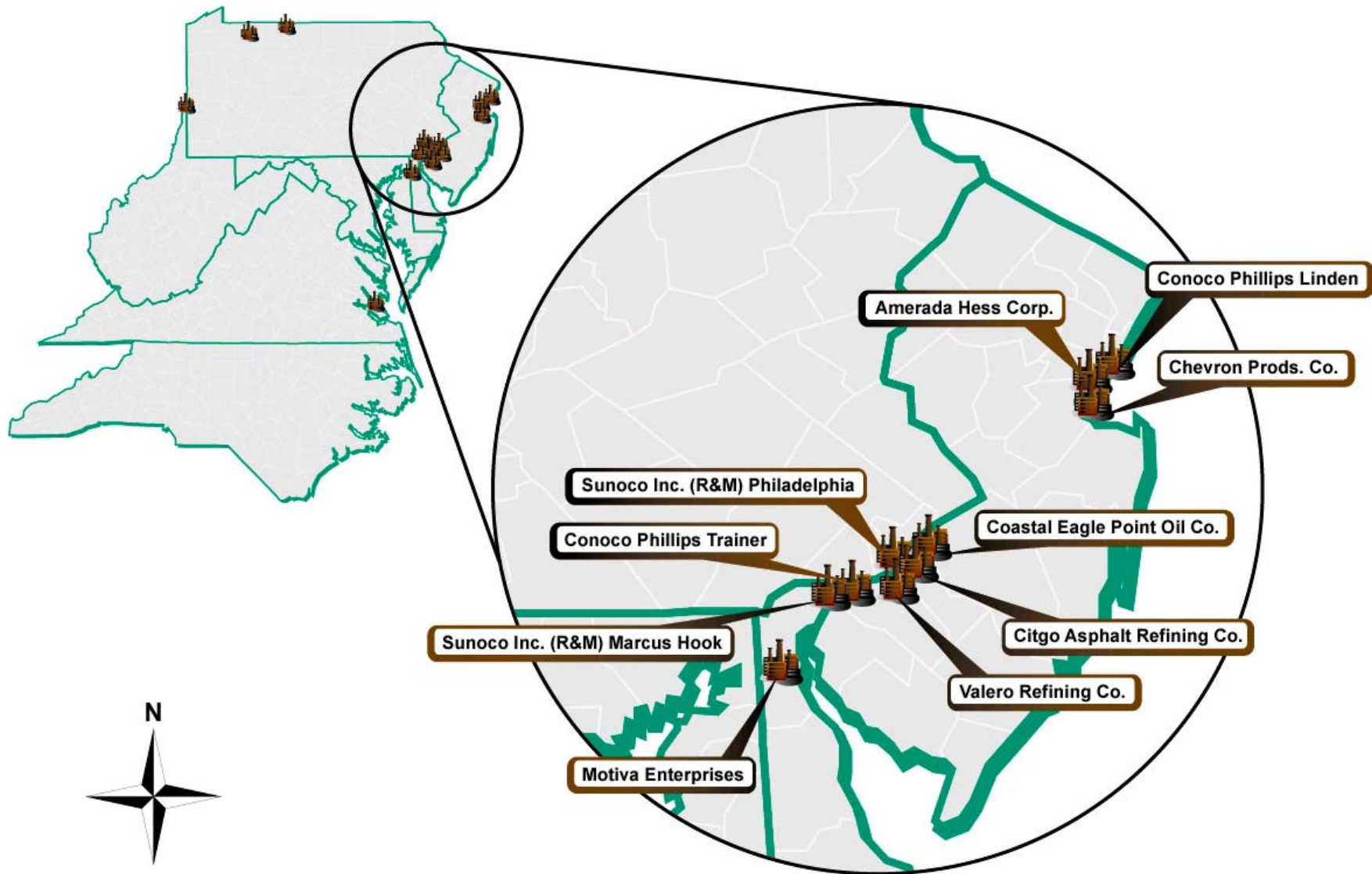




RACT Work

Area	Asphalt Paving
	Autorefinish Coatings
	POTWs
	Adhesives
Point	Asphalt Production Plants
	Cement Kilns
	Lime Kilns
	Glass/Fiberglass Furnaces
	Municipal Waste Combustion
	Petroleum Refineries
	Metals Productions
	Peaking Units
Point/Area	Degreasing
	Printing and Graphic Arts
	Industrial Surface Coating

MARAMA Refinery Emissions Control Project



MARAMA Refinery Emissions Control Project

- **Work completed:**
 - Emissions, permits, enforcement settlements, and existing regulations identified.
 - Available control technologies identified, technical feasibility analyzed, most effective controls evaluated.
- **Source categories under consideration:**
 - Catalytic and Thermal Cracking Units
 - Boilers and Heaters
 - Flares
 - Leaks/Fugitives
- **Next Steps:**
 - Technical Support Documentation (winter 06)
 - Model Rule Development with Stakeholder participation (spring 06)

Multi-P

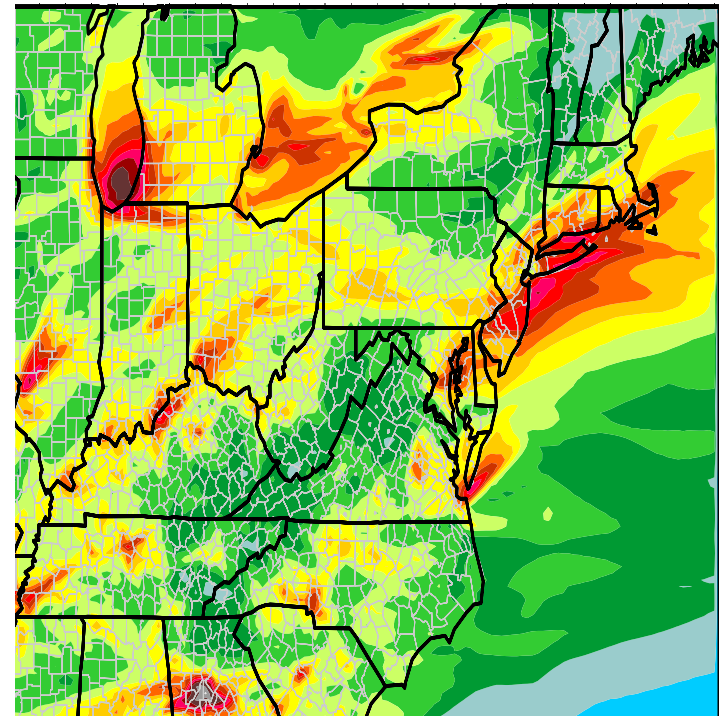
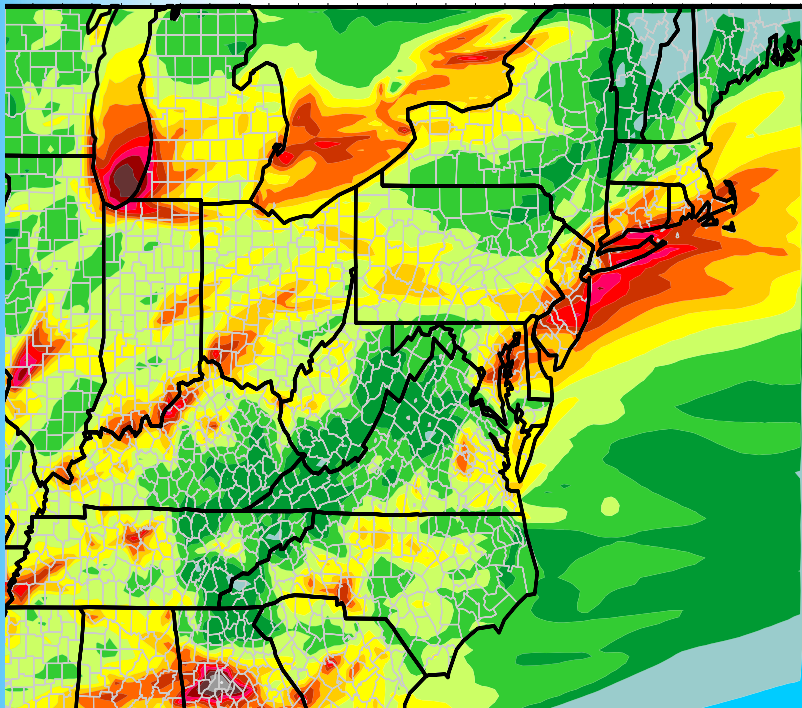


2010 CAA vs. CAIR/CSA

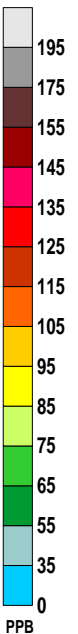
8-hour Ozone Modeling for July 1995 Episode

CAA

CAIR/CSA



July 6 - 15,
1995 Episode



OTC's Multi-Pollutant Position

Pollutant*	Historical Baseline	Emission Reduction Targets
NOx	3.65 million tons (EPA projected emissions 2005)	2008 – 1.87 million tons 2012 – 1.28 million tons
SO₂	8.95 million tons (Phase II Acid Rain Cap)	2008 – 3.0 million tons 2012 – 2.0 million tons
Mercury	48 tons (1999 emissions)	2008 – 15 tons 2012 – 10 tons 2015 – roughly 5 tons

*The OTC encourages Congress to act on a national program or programs promoting efficiencies that address emissions such as carbon dioxide and other greenhouse gases in a cost-effective, coordinated, and streamlined manner.



Multi-P Straw Proposal

	Pollutant	OTC National Cap (tons)	Required National Emission Rate (lb/MMBtu)	Mid-West RPO EGU White Paper Proposal (2009/2013)		Straw Proposal
				EGU1	EGU2	
NO _x	Phase I (2008)	1,870,000	0.13	0.15	0.12	0.12 (2009)
	Phase II (2012)	1,280,000	0.09	0.10	0.07	0.08 (2012)
SO ₂	Phase I (2008)	3,000,000	0.21	0.36	0.24	0.24 (2009)
	Phase II (2012)	2,000,000	0.14	0.15	0.10	0.14 (2012)

Heat Input (2000) 29,221,854,977



Activities

- Work with LADCO/MWRPO to Compare Results of OTC Straw with EGU1/EGU2
- IPM Runs to Re-evaluate effect
 - Current Assumptions
 - High Gas, Oil Prices; Higher Coal Prices
- Reliability
 - Meet with RTO/ISO/DPUC
 - Address Generation, Transmission, Distribution

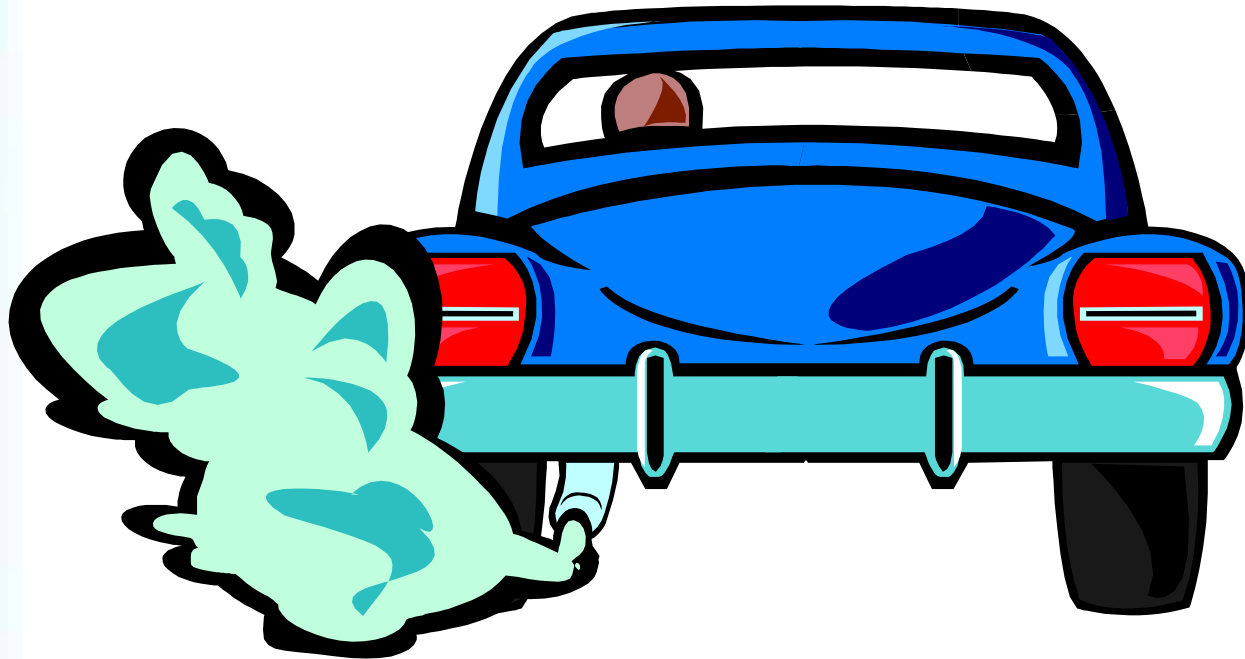


RACT Related Work

- ICI Boilers
 - 100 MMBTU
 - Identify Appropriate RACT Measures
 - 250 MMBTU
 - Similar to EGU Recommendations?
 - Trading Program Options?
- Peaking Units



Clean Corridors Control Measures Update



Summary of Mobile Measures

- Mandatory Chip Reflash
- Reformulated Gas
- Adopt CA Diesel Fuel Regulation
- Diesel Retrofits in the OTR
- Voluntary Measures

Chip Reflash

- **Recommendation:** Adopt NESCAUM model rule for mandatory chip reflash in all OTR states
- **Benefits:** 63 TPD NO_x emission reductions
 - 41 TPD Northeast states
 - 22 TPD Mid-Atlantic states
- **Rationale:** Expected federal reductions are not being achieved
 - EPA program falling far short of its expected 90% compliance rate,
 - OTC states are not precluded from putting a mandatory program into place
 - Cost is low; < \$100/ton of NO_x reductions, and engine manufacturers provide kits for free, assume cost of installation

Reformulated Gas

- **Recommendation:** Examine possibility for a regional RFG throughout the OTR
- **Benefits:** ~ 127 tons/summer day
 - Approximately 3.4 tpsd NO_x
 - Approximately 123 tpsd VOC
- **Rationale:** One-third of gasoline sold in the OTR is not RFG
 - 2005 Energy Policy Act provides authority for RFG in the OTR, and eliminates the oxygenate requirement
 - Potential to reduce the number of fuels in the region
 - Need to examine whether/what states may have statutory/legislative constraints re RFG

CA Diesel Fuel Regulation

- **Recommendation:** Examine feasibility for adopting CA diesel fuel in the OTR
- **Benefits:** May be limited, and only from non-road, locomotive and marine sources
- **Rationale:** May offer substantial SO₂ and PM reductions, but limited NO_x
 - CA estimates 6% NO_x, 80% SO₂ and 25% PM reductions
 - Federal on-road rules in place this year
 - Federal non-road fuel to go to 500 ppm in 2007, then to 15 ppm in 2010 (locomotives and marine in 2012)
 - Need to assess benefits from accelerating non-road, L&M from 2010/2012 dates, esp. in terms of NO_x

Diesel Retrofits in the OTR

- **Recommendation:** Pursue opportunities for conducting voluntary diesel retrofit projects in the OTR
- **Benefits:** Ranges from 30% to 99% NO_x control efficiency, depending on the technology
- **Rationale:** Several voluntary projects are being implemented via grants and partnerships with federal agencies
 - The Energy Policy Act of 2005 may provide for additional projects if funds are appropriated
 - Northeast and Mid-Atlantic collaboratives with EPA Regions have formed and are examining possibilities along I-95 corridor
 - Voluntary approach is most feasible at this time; cost/ton range from \$3,000 to as much as \$150,000, so financial and other incentives are helpful in achieving higher implementation rates

Other Potential Measures

- Anti-idling regulations
 - Areas in 8 OTR states have some level/kind of anti-idling regulations in place
 - Have relatively high emission reduction potential and short-term implementation
- Stage 1 gasoline distribution
- Replacement catalyst program for pre-1996 vehicles
 - Preliminary estimates indicate 50% reduction in NO_x may be possible

Possible Voluntary Measures

- Electrification of ground service equipment at airports and cargo handling equipment at shipbuilders and ports
- Reduced licensing fees and/or EZ Pass discounts for green vehicles, i.e., those that have done retrofits
- Lawnmower/garden equipment replacement incentives
- OTC is investigating these and other options