

# Growth and Control for LADCO Round2 Modeling

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Run	Description	2009	2018
Base I+	2002 baseyear emissions inventory		
Scenario 1	"On the books" controls (redo from Round 1, as necessary)	x*	x
Scenario 2	"On the books" plus "on the way" controls (redo from Round 1, as necessary)	x*	x
Scenario 4	Scenario 2, plus EGU controls:		
	a. EGU1 in 5-state region	x*	x
	b. EGU1 in 13-state MWGA region	x	x
	c. EGU2 in 5-state region	x	x
Scenario 3	Scenario 4a, plus MACTEC VOC controls (8 point/area source categories):	x*	
	a. In all ozone nonattainment counties:		
	MACTEC point source control measures		
	MACTEC area source control measures		
	Low RVP fuel		
	b. In all ozone nonattainment counties and adjacent counties	x	
	MACTEC point source control measures		
	MACTEC area source control measures		
	Low RVP fuel		
	c. Regionwide (5-state region)	x	
	MACTEC point source control measures	Low Priority	
	MACTEC area source control measures		
	Low RVP fuel		
Scenario 5	Scenario 3a, Scenario 4a, plus MACTEC point and area source SOx and NOx controls (ICI boilers, refineries, cement kilns)	x*	
Scenario 6	Scenario 2 plus BART for non-EGU sources (ICI boilers, refineries, cement kilns, and iron and steel plants)		x
		* = additional 12 km run	
	EGU1= 2009 - SOx:0.36 lb/MMBTU, NOx: 0.15 lb/MMBTU		
	2013 - SOx:0.15 lb/MMBTU, NOx: 0.10 lb/MMBTU		
	EGU2= 2009 - SOx:0.24 lb/MMBTU, NOx: 0.12 lb/MMBTU		
	2013 - SOx:0.10 lb/MMBTU, NOx: 0.07 lb/MMBTU		

# “On the books” Controls

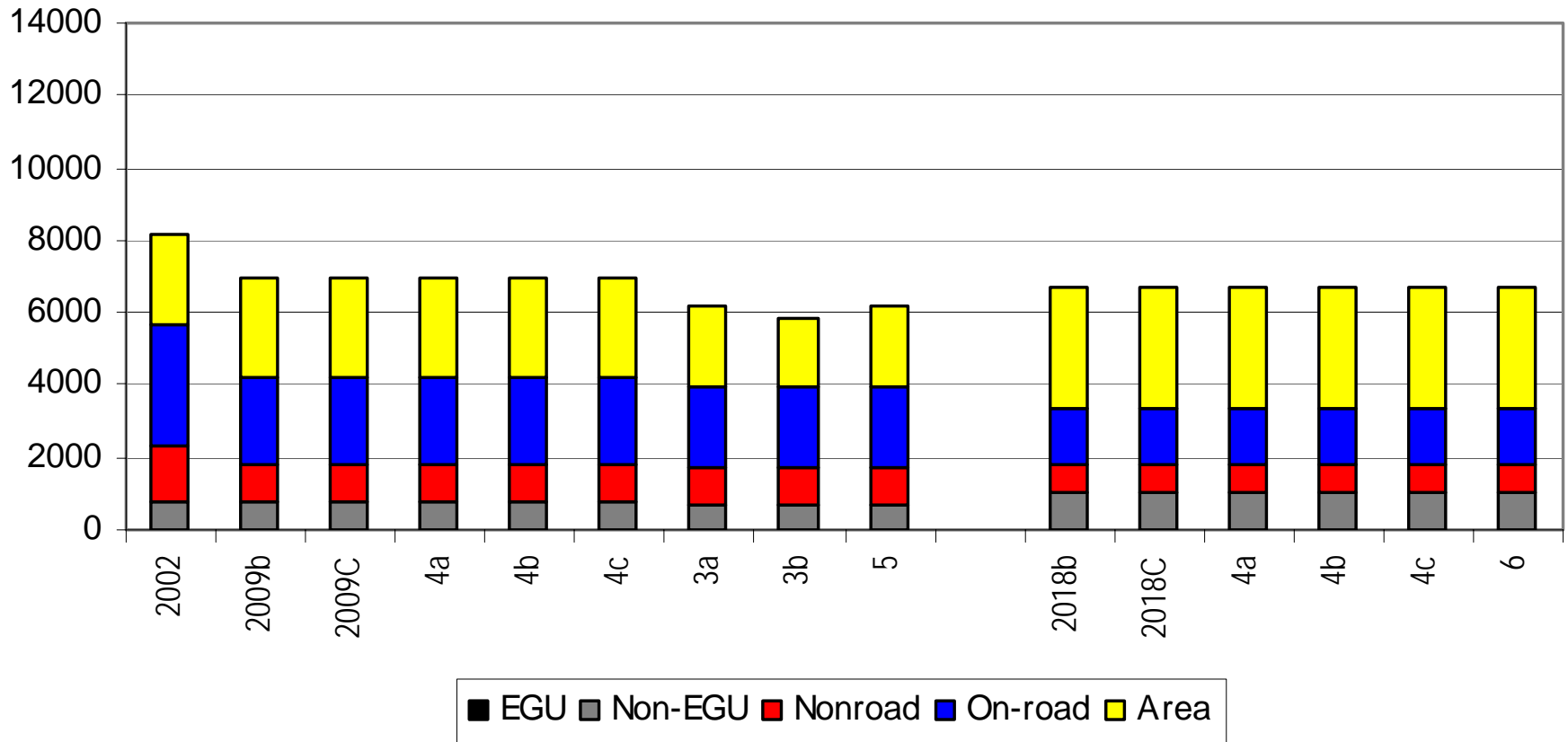
- Current state/local rules to meet 1-hour ozone requirements (e.g., motor vehicle I/M, reformulated gasoline, and NOx SIP Call)
- Heavy-duty diesel (2007) engine standard/Low sulfur fuel
- Federal control programs incorporated into NONROAD model (e.g., nonroad diesel rule), plus the evaporative Large Spark Ignition and Recreational Vehicle standards
- Federal railroad/locomotive standards
- Federal commercial marine vessel engine standards
- Tier II/Low sulfur fuel
- Title IV for EGUs (Phases I and II)
- VOC 2-, 4-, 7-, and 10-year MACT standards
- Combustion turbine MACT
- Industrial boiler/process heater/RICE MACT

# Future Years to Model

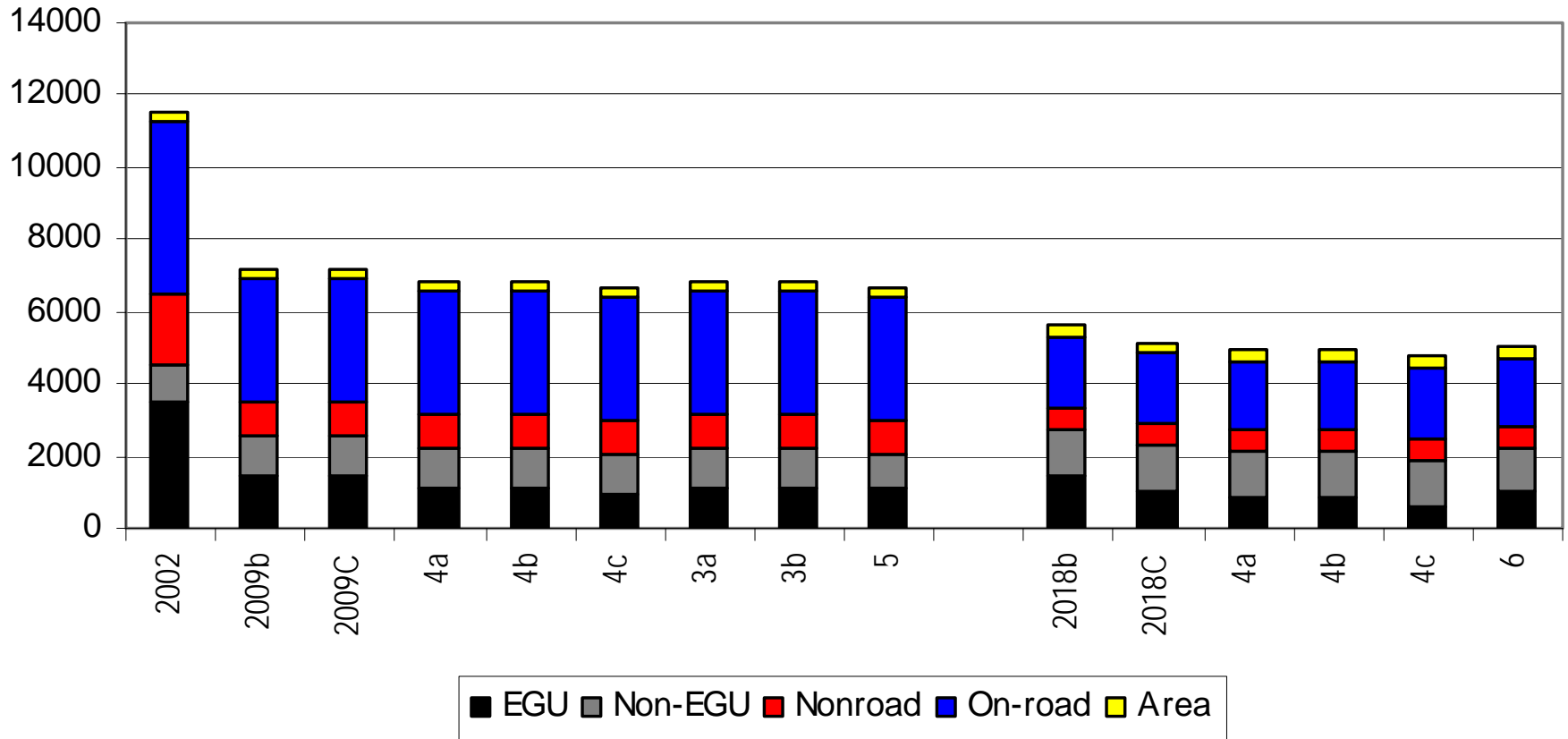
2006 (2007)	Attainment year for marginal O <sub>3</sub> NA areas
2008 (2009)	Attainment year for basic O <sub>3</sub> NA areas
2009 (2010)	Attainment year for moderate O <sub>3</sub> NA and PM <sub>2.5</sub> NA areas
2012	Attainment year for serious O <sub>3</sub> NA areas
2018	First milestone year for regional haze

*Note: E.H. Pechan provided growth factors for each year between 2003 and 2018, and control factors for 2007, 2008, 2009, 2012, and 2018*

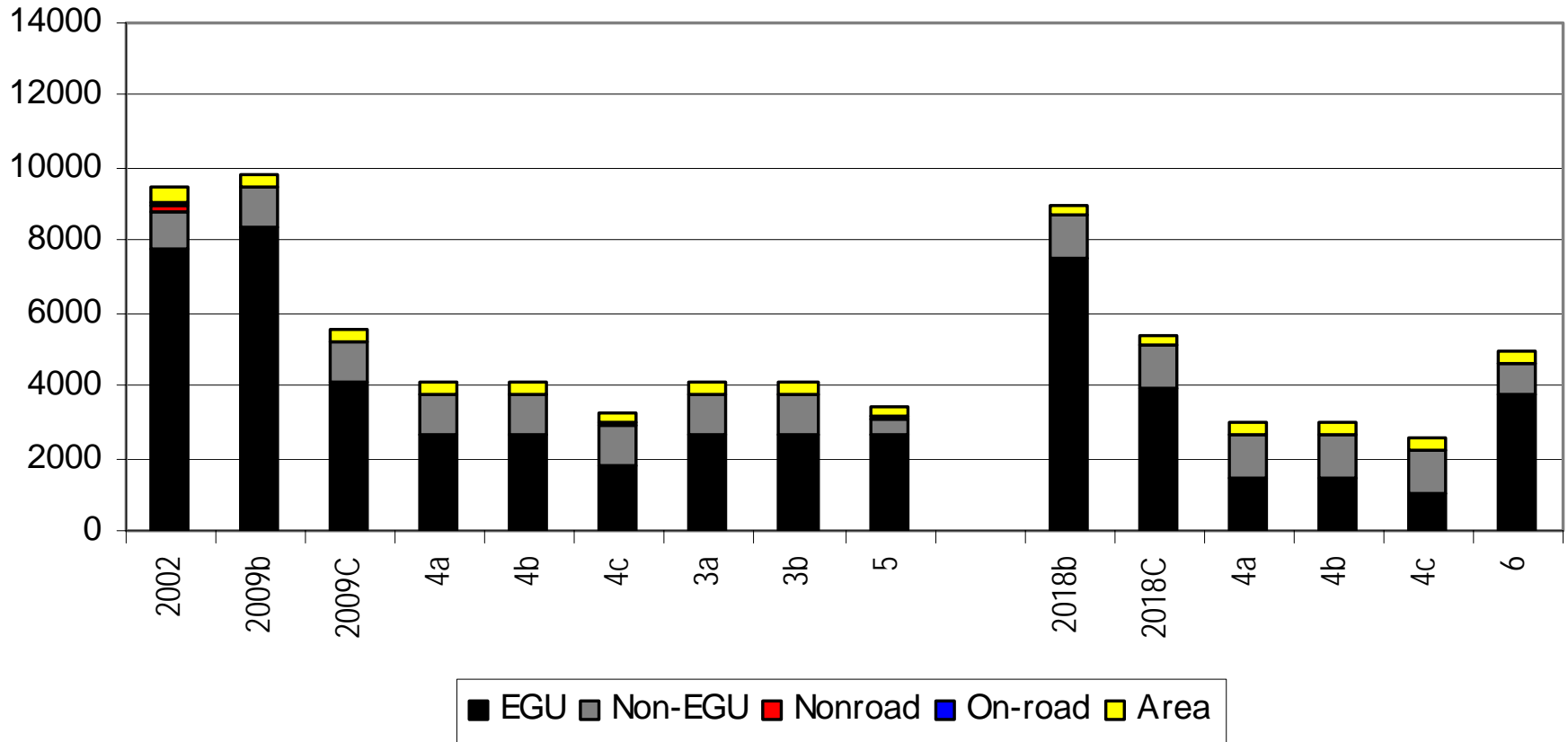
# Round 2 Emissions: VOC



# Round 2 Emissions: NOx

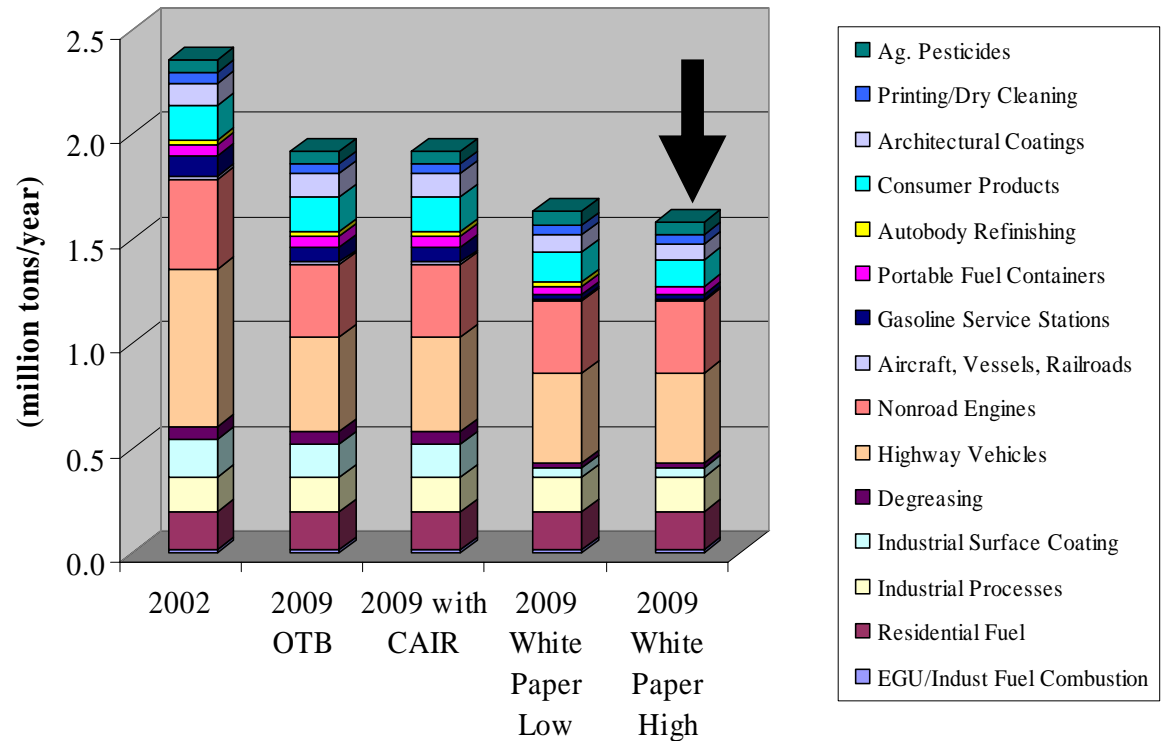


# Round 2 Emissions: SO2



# Candidate Control Measures: VOC

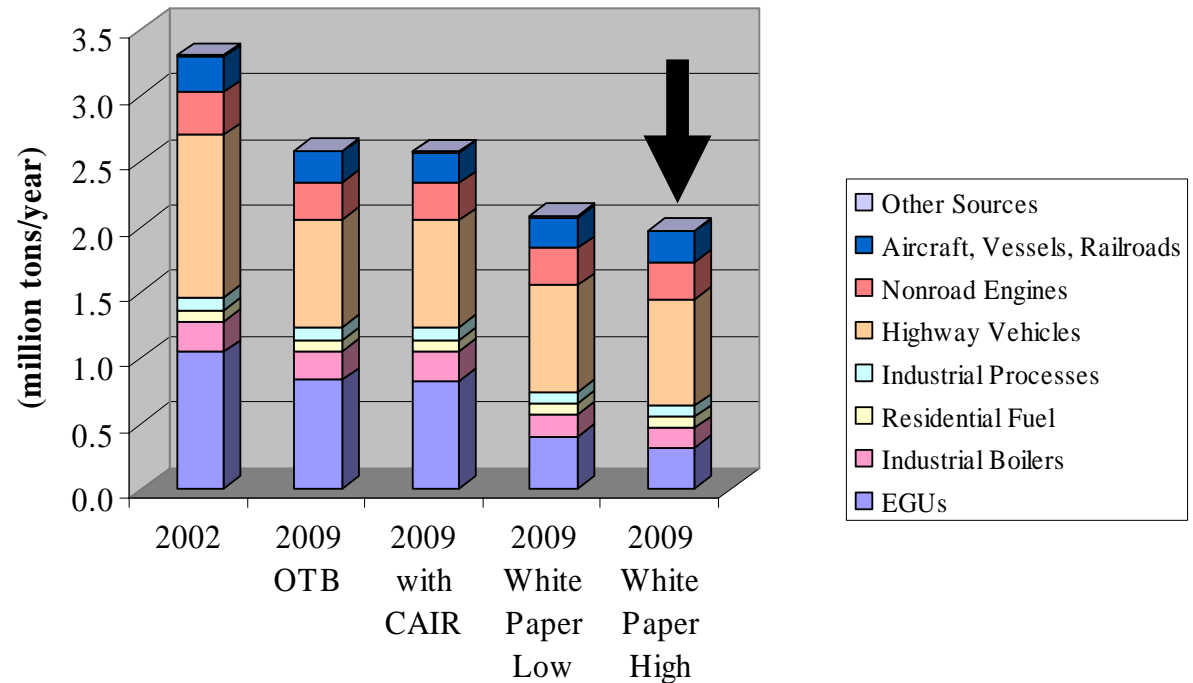
- Industrial surface coating
- Industrial solvent cleaning
- AIM coatings
- Portable fuel containers
- Automobile refinishing
- Consumer and commercial solvents
- Asphalt paving



**Note, also, draft regional fuels strategy reduces on-road VOC emissions from 2370 to 2230 TPD (-140 TPD)**

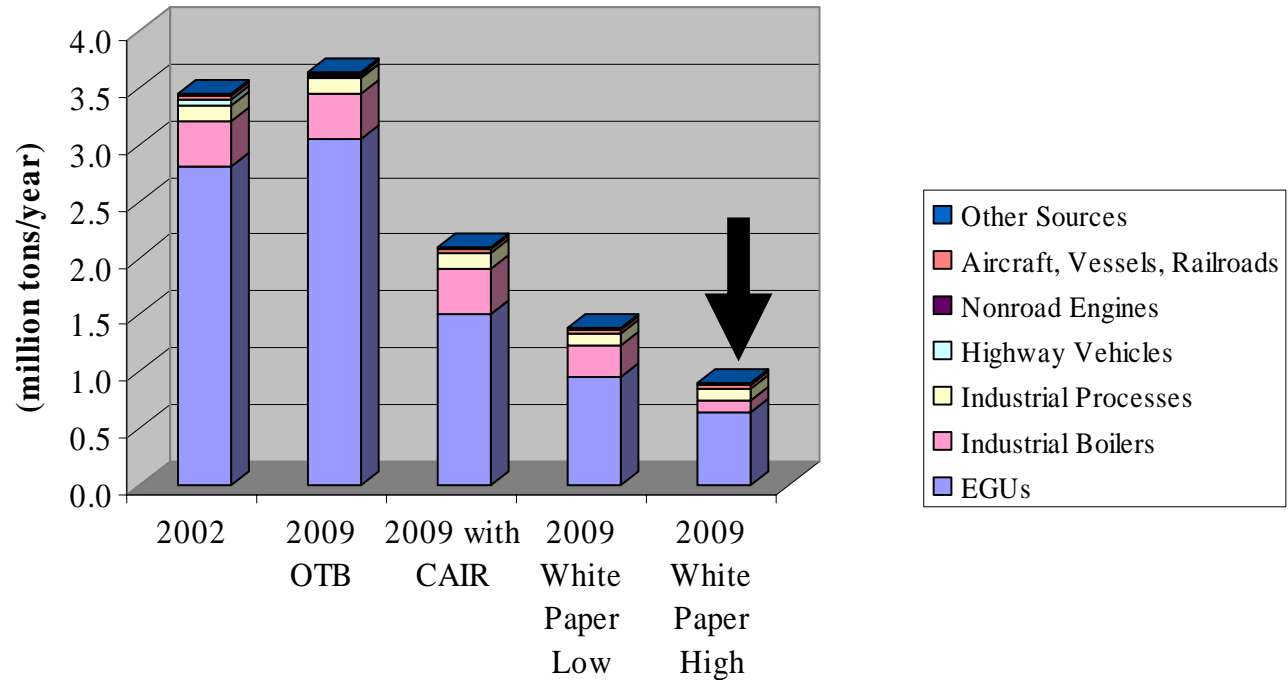
# Candidate Control Measures: NOx

- EGU1, EGU2
- ICI boilers
- Cement kilns

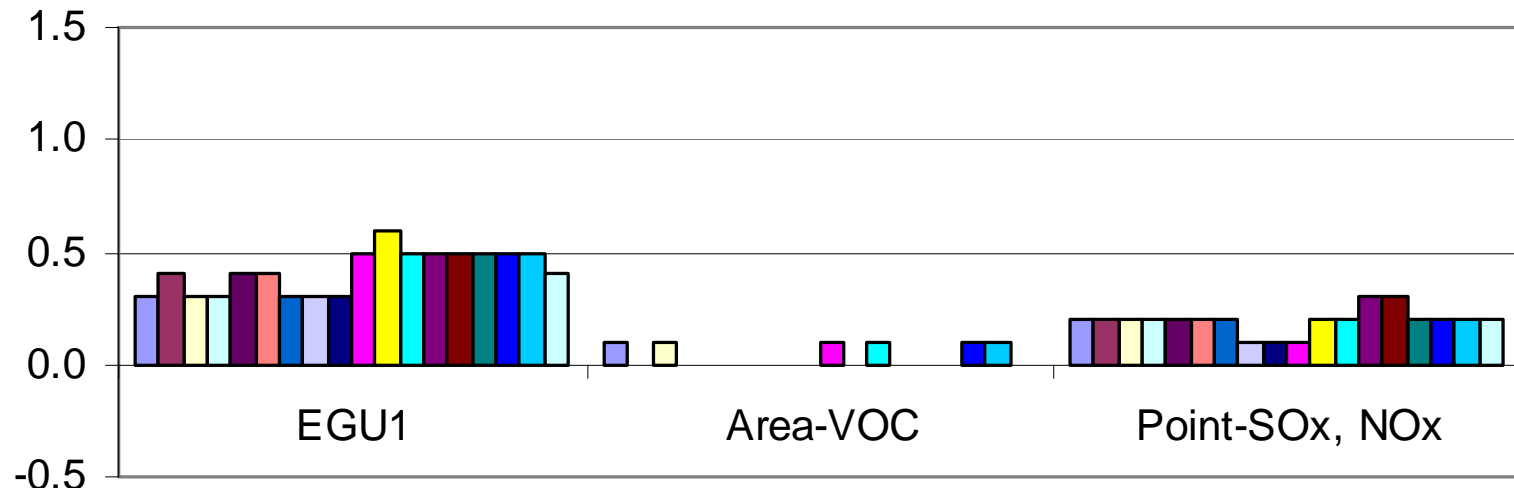
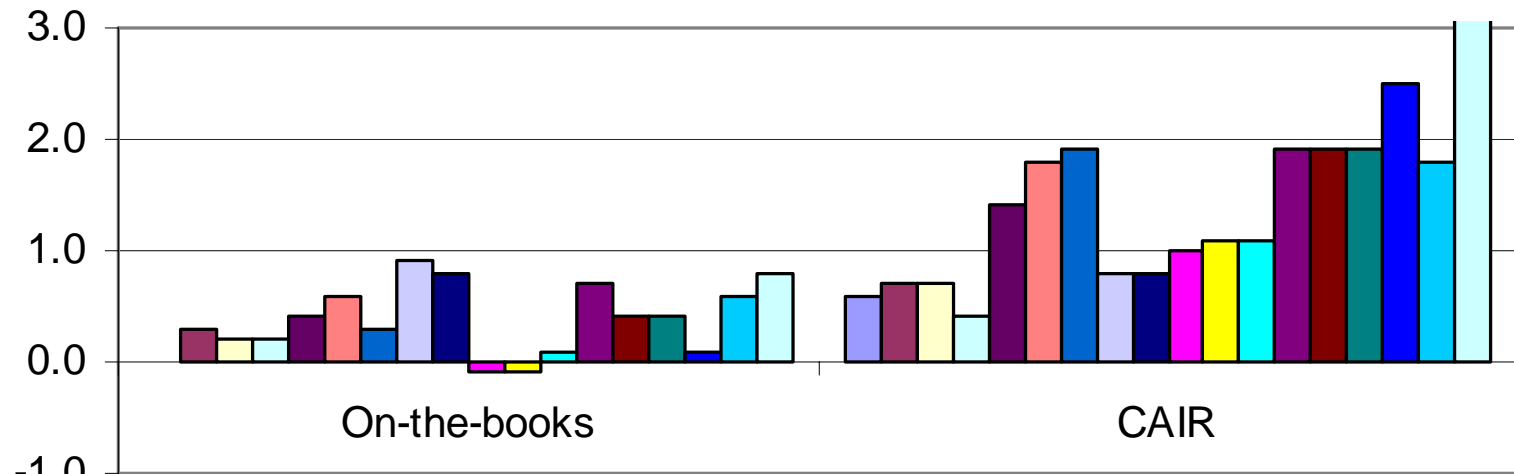


# Candidate Control Measures: SO<sub>2</sub>

- EGU1, EGU2
- ICI boilers
- Cement kilns



# Round 2 Strategies: Change in PM<sub>2.5</sub> Design Values

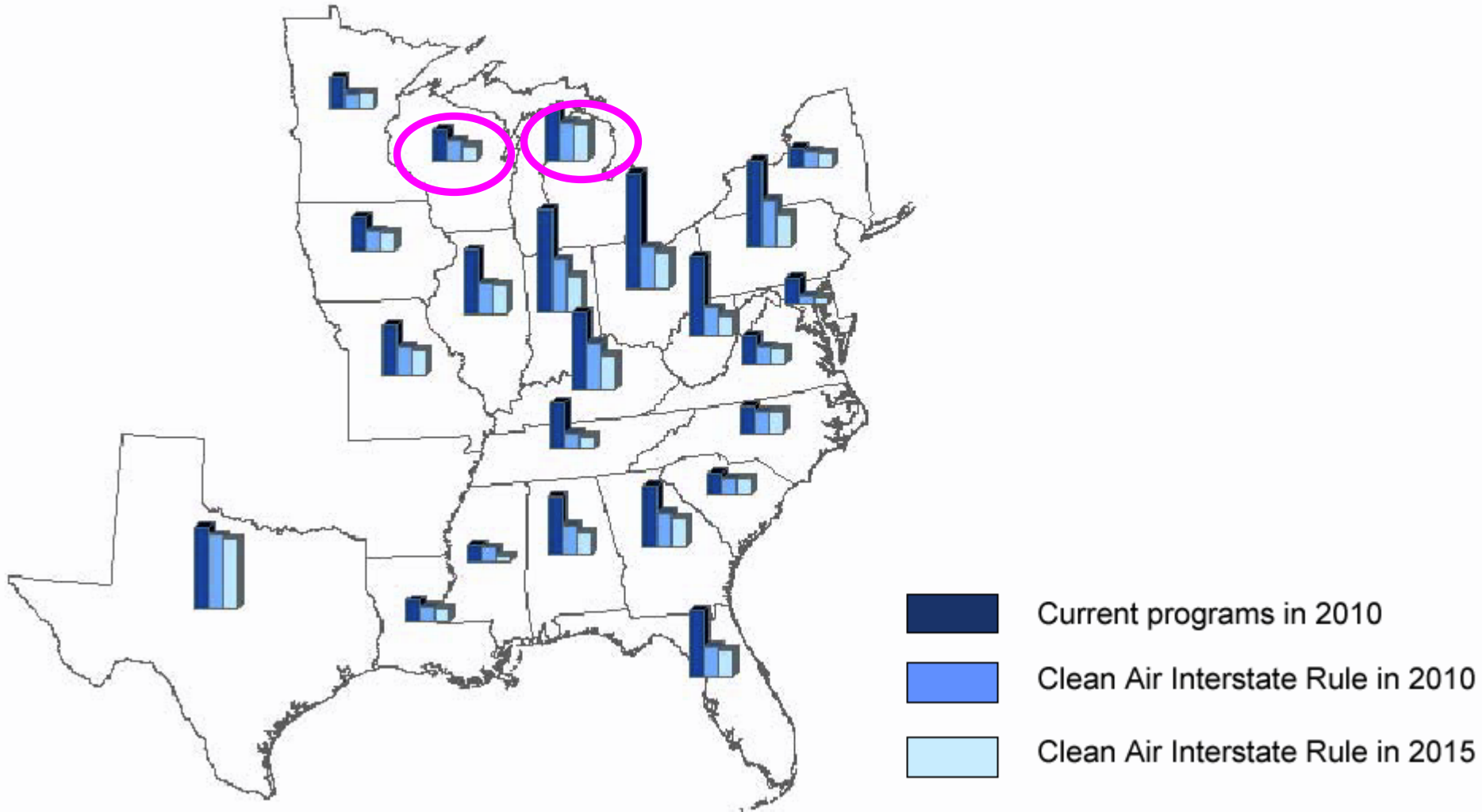


- |                     |                         |                       |
|---------------------|-------------------------|-----------------------|
| Chicago-Mayfair     | Chicago (Cicero)        | E. Chicago (IN)       |
| Milwaukee           | Indy (Michigan St.)     | Jasper (Dubois Cty)   |
| Louisville          | St. Louis (GraniteCity) | St. Louis (Supersite) |
| Detroit (Wyandotte) | Detroit (Dearborn)      | Toledo                |
| Cincinnati          | Dayton                  | Columbus              |
| Canton              | Cleveland               | Pittsburgh            |

# CAIR Implementation

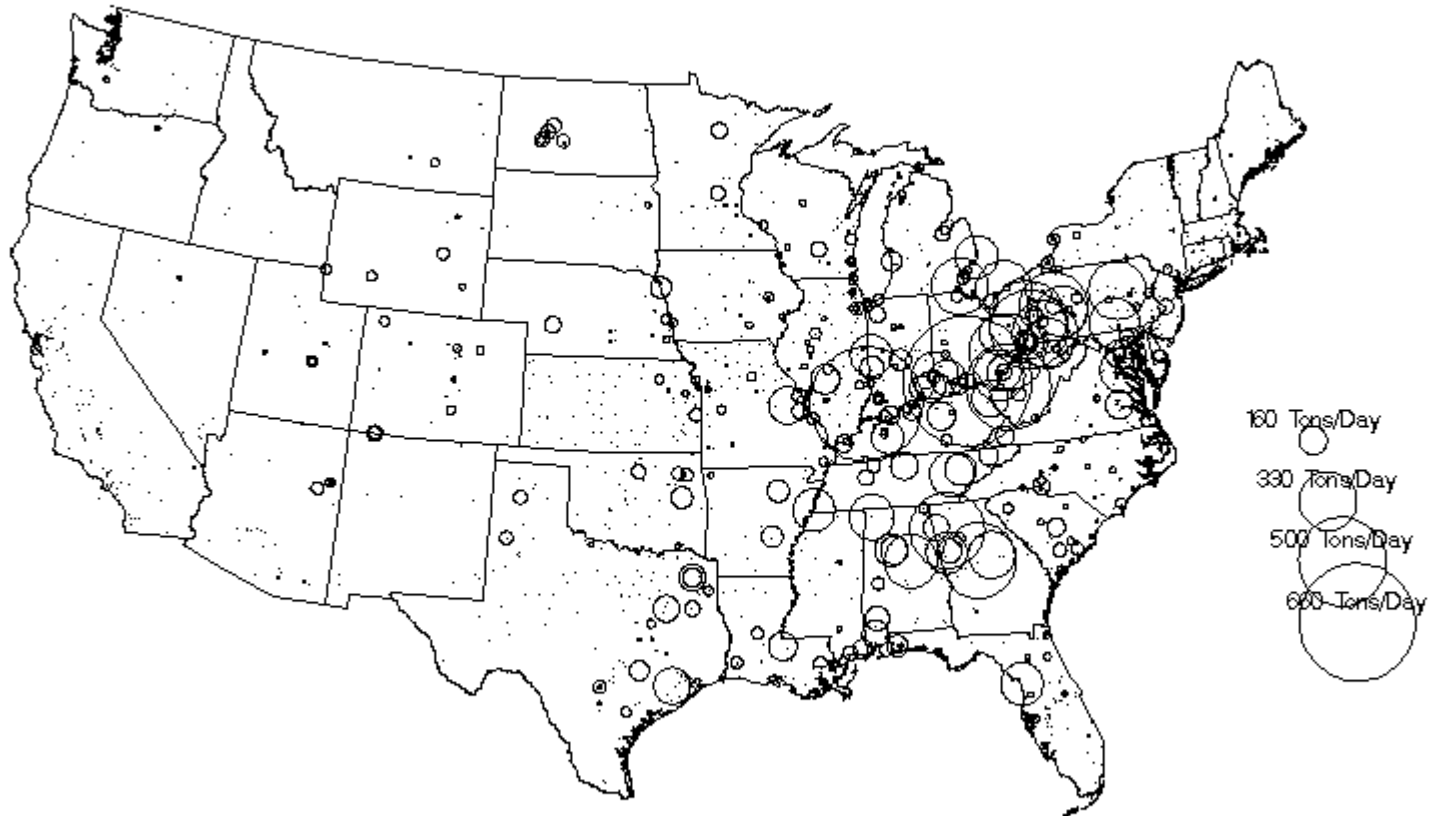
# Projected Annual NOx Emissions for Power Plants under CAIR

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# Circle Plot of SO2 Sources

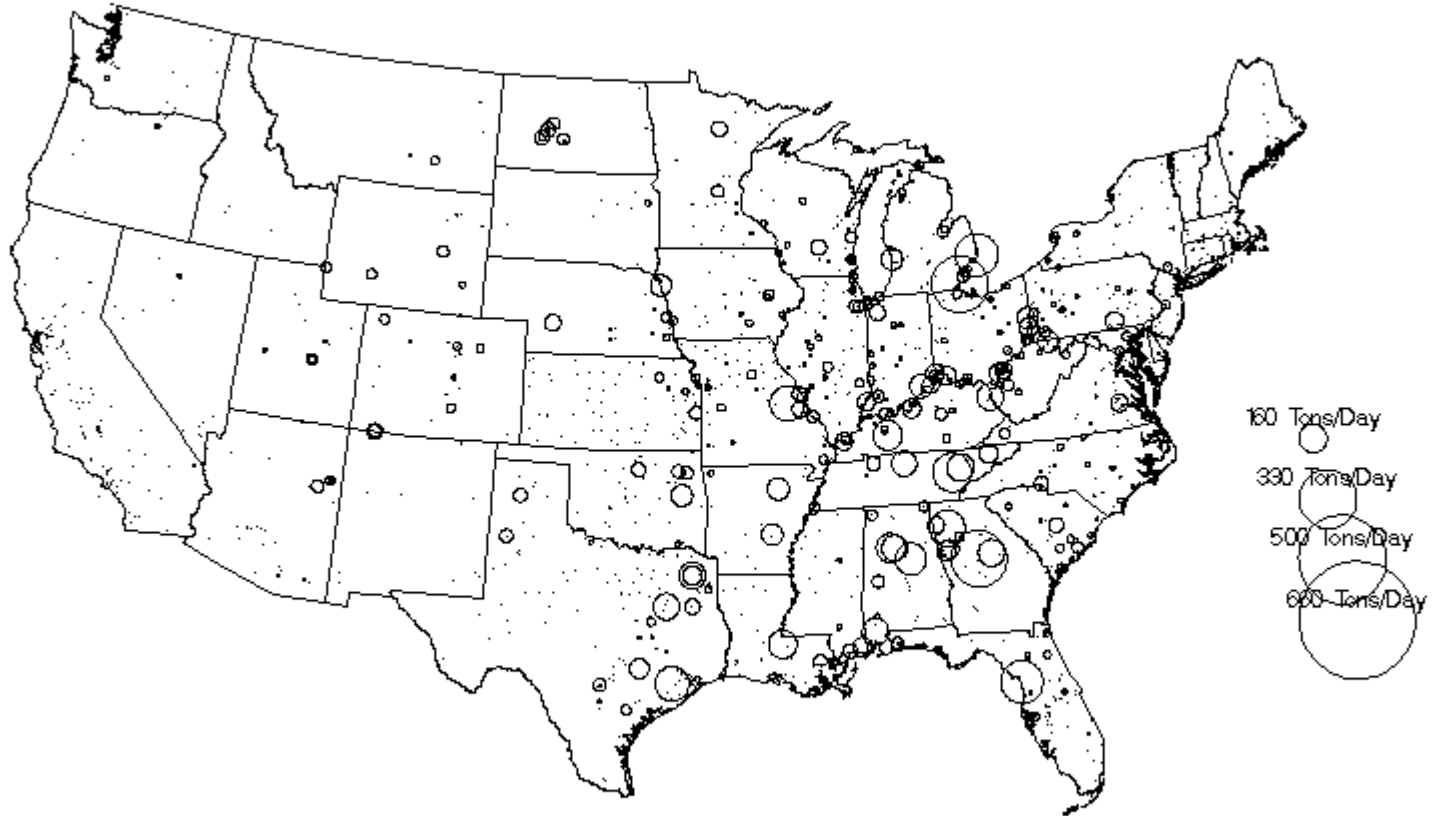
CASE: strat1\_2009



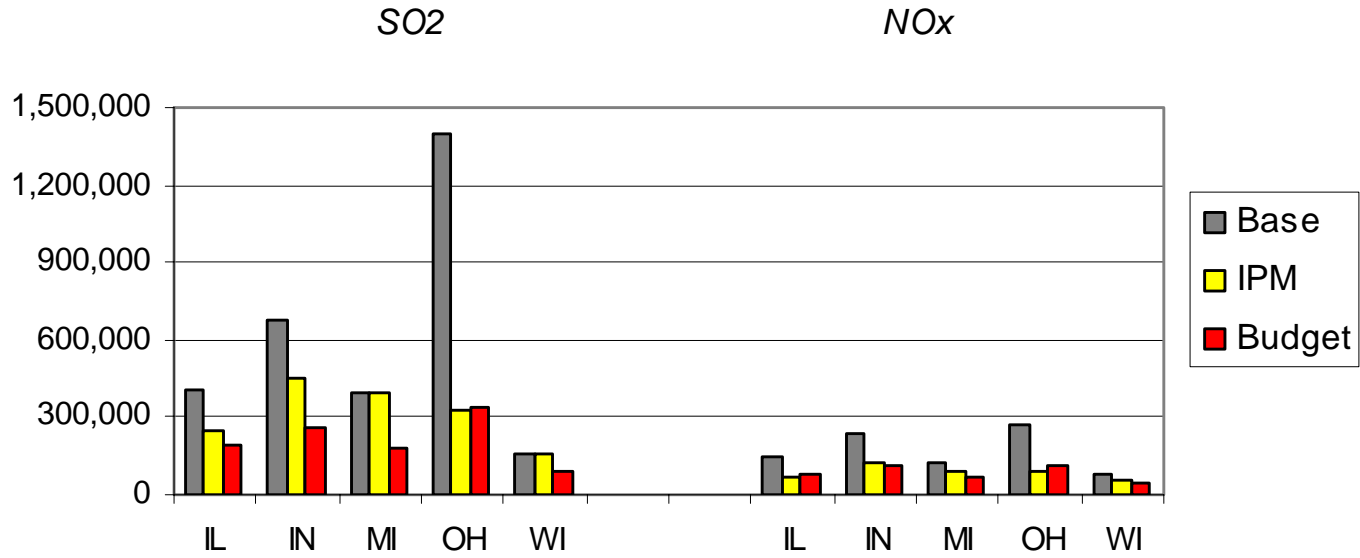
# CAIR

## Circle Plot of SO<sub>2</sub> Sources

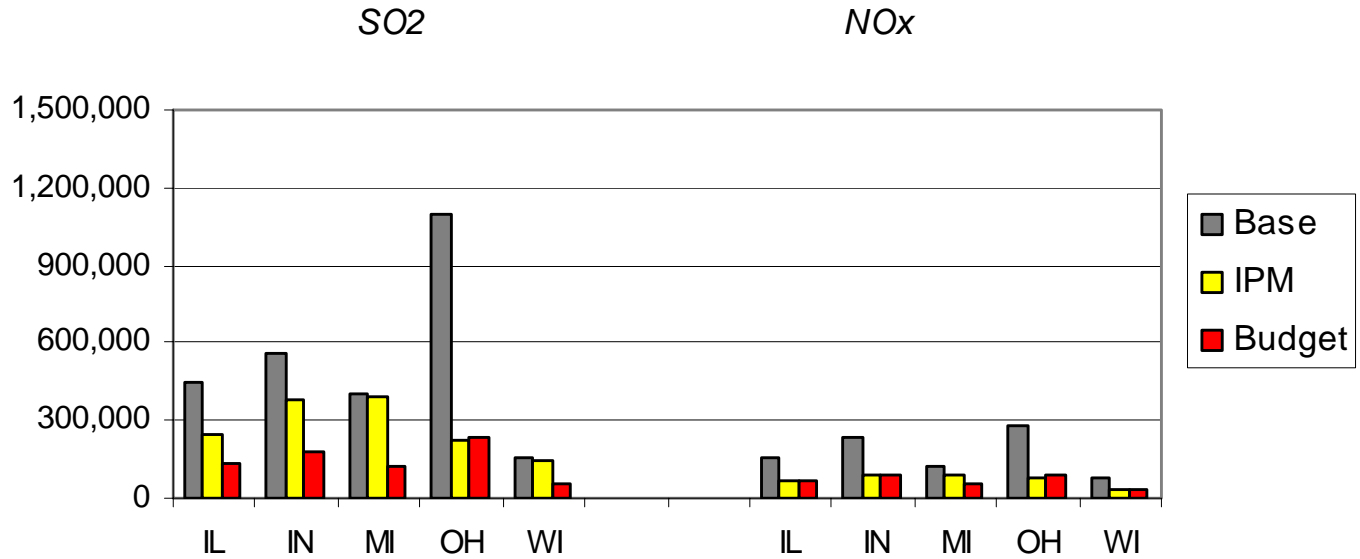
CASE: strat2\_2009



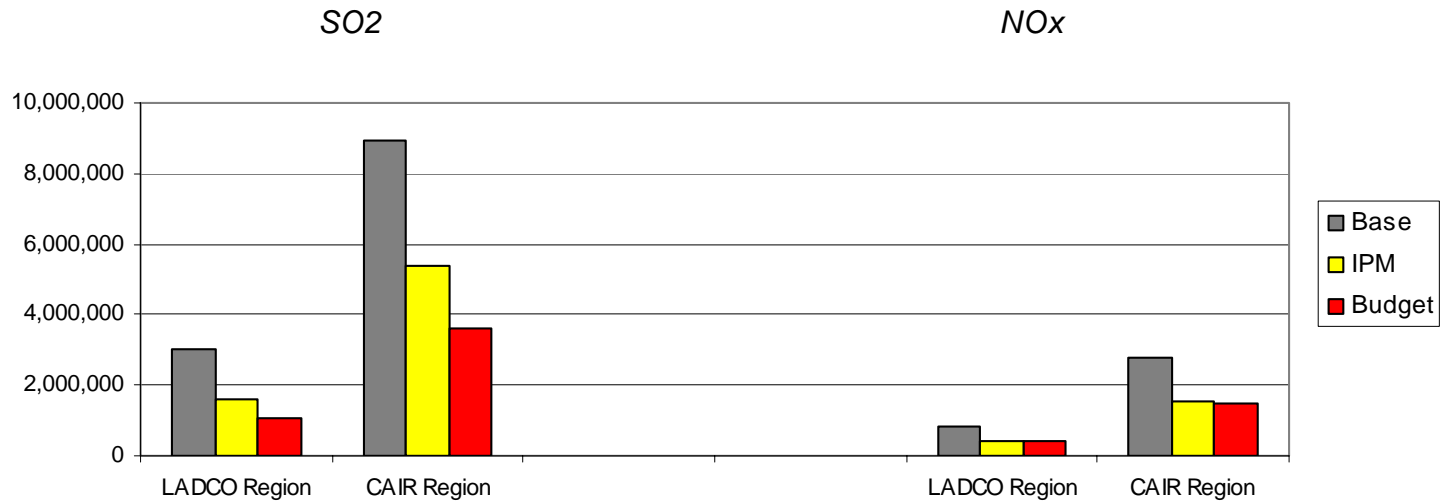
# 2010



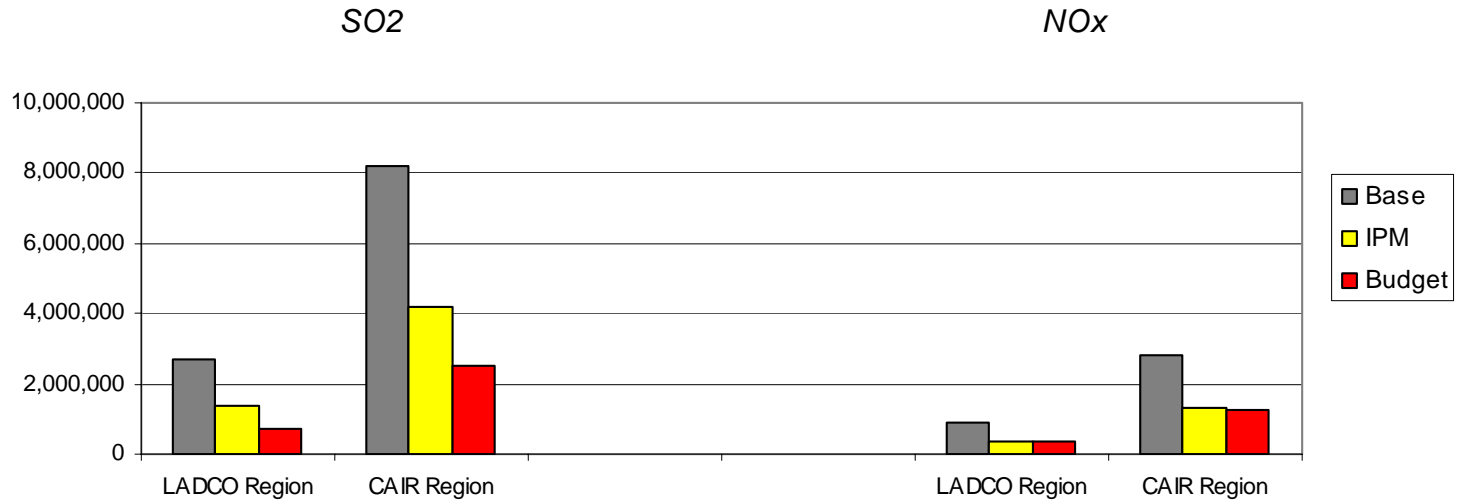
# 2015



2010



2015



# CAIR Implementation: Trading Questions

- Should we examine a “no-trading” CAIR run?
- Are reductions at certain power plants needed for attainment (e.g., power plants in or near nonattainment counties)?
- If so, then should we insist on those (CAIR) reductions or consider beyond-CAIR reductions (e.g., BART, if applicable, or EGU1/EGU2)?

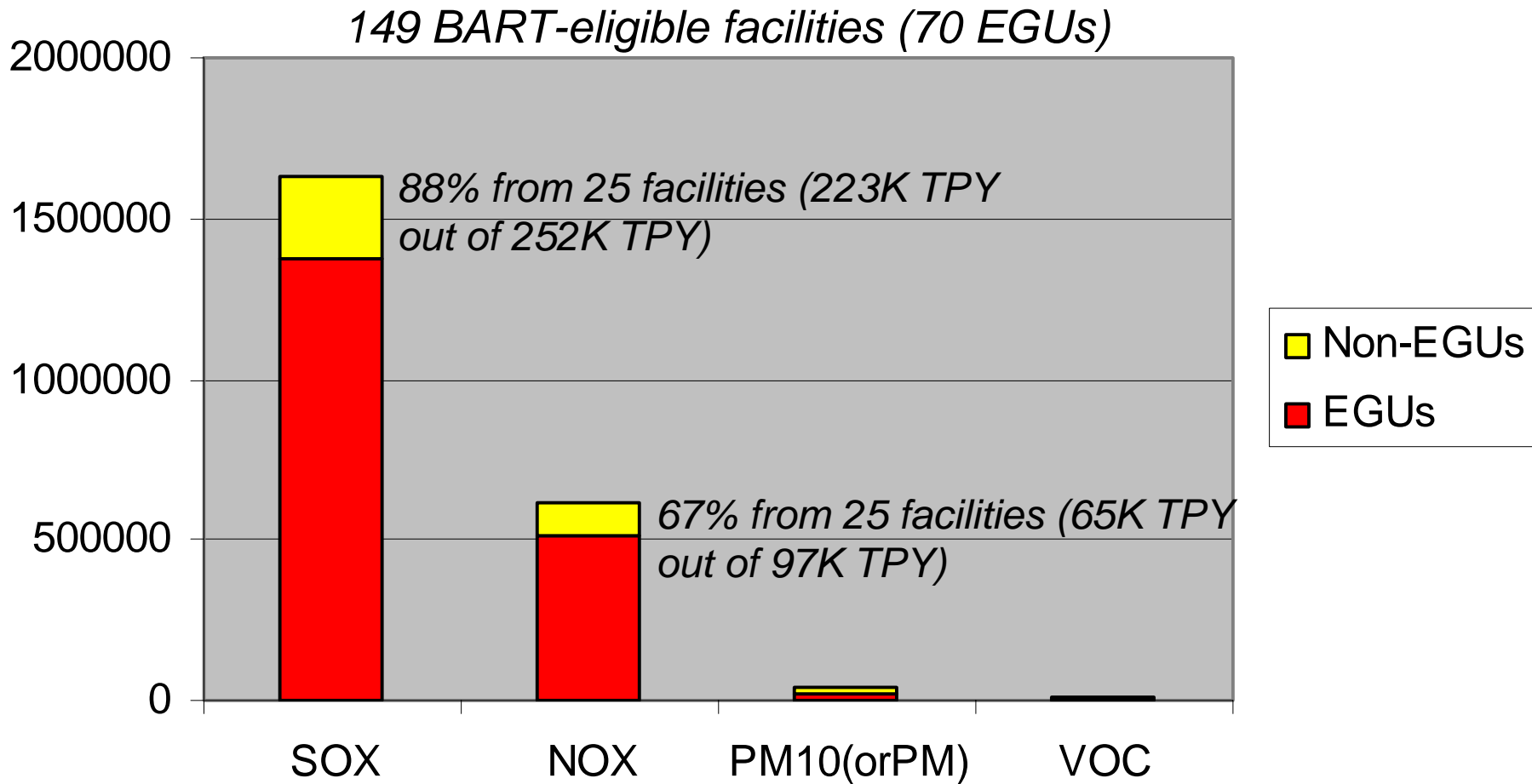
# CAIR Modeling: “No Trading” Option

- Technical Approaches
  - Rerun IPM with constraints
  - Post-process IPM outputs assuming electrical demand “neutral” (intra-state basis)
- Policy Questions
  - Should we revise the allowances within the 5-state region?

# “No Trading” Tools/Options

- IPM generates the least cost solution
- Solution: Use the 2009 Base IPM Output
  - The only set that has emission rates and technology
- Create tools that pick sources to control based on Q/D(Class 1 or NA), BART, or emission mass controlled by region, state, corporation.
- Problem: Could create solution that violates reliability, construction timing, facility level reality.

# BART-Eligible Sources: Emissions (TPY)



# Inventory Schedule

- May 16: Begin update of base year inventory
- June 1: Begin 12 km emissions modeling
- July 1: Begin processing IPM output data
- July 1: Deliver Base “J” Inventory
- August 15: Deliver Round 3 emissions
  
- Aug-Oct: Continue update of base year inventory (network data, other fixes)
- Nov 1: Deliver Base K inventory
  
- December 15: Deliver Round 4 emissions

# Base J/Round 3 Priorities

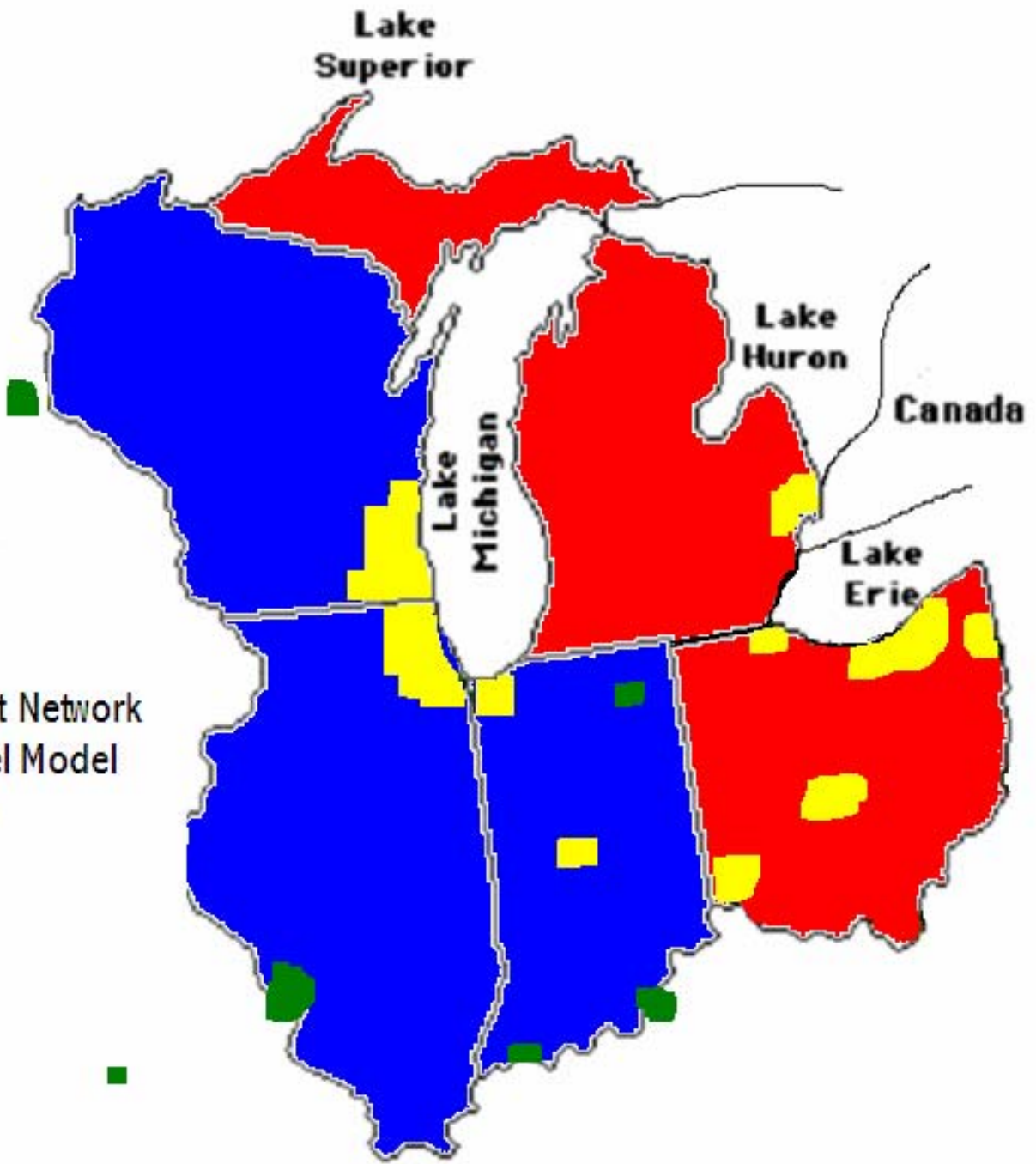
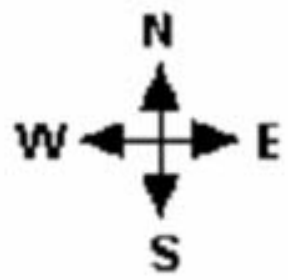
- Inventory improvements
  - Base year improvements
  - 50% of state Point and Area updated
  - Rerun Nonroad (Include Minnesota)
  - State comments on growth and control factors
  - Incorporate WRAP's dust inventory
  - Include CENRAP/MANE-VU/VISTAS Inventories
- New IPM outputs and Crude “No Trading”
- 12 km emissions

# Base K Improvements

- First Round of CONCEPT Incorporation – Things we don't do well in current models
  - Offroad – Run CONCEPT nonroad model which calculates temperature adjusted nonroad estimates
  - EGU – Include complex analysis of CEM temporal data into modeling process.  
Potential

# CONCEPT and T3 Network Incorporation

- Project To include 25 Urban/Statewide link based networks + Complex Temporal.
- 2002 was in original contract for T3.
- 2009 and 2018 should be easier but still complex
- ?How many days will it take to run model?



- Statewide Count Network
- Statewide Travel Model
- Urban Network
- Undecided

# State Support For CONCEPT

(Things we don't do with current models in red)

1. Implement EH Pechan's IPM to NIF Converter(Fang, Edick)
2. Continue work on the CEM analysis and develop Month, Day, and Hour profiles (Edick)
3. Get T3 and CONCEPT and new networks. (Janssen/Vit)
4. Get Midwest RPO's RPO control files working in the Forecasting model(Judson/Heatherington)
5. Get Qt and Qgis working with CONCEPT. (Brooks)
6. Get Midwest RPOs nonroad inputs to work in CONCEPT (Heatherington)
7. Run 2002 Base J inventory in CONCEPT's point and area model. Enhance QA as needed. (Judson/ Spraiage)
8. Re-write the CONCEPT Output Tool (Janssen, Edick)
9. Run 2002 biogenics with CONCEPT model for 36 and 12 KM grids. Also work with contractors to include MEGAN+ science in model for secondary PM chemistry. (Baker, Janssen)
10. Incorporate LADCO's updated speciation and temporal allocations factors into CONCEPT for point and area sources. (Sprague)
11. Do Ammonia model sensitivities: (Sponseller, Panuley)