Texas Air Quality Planning

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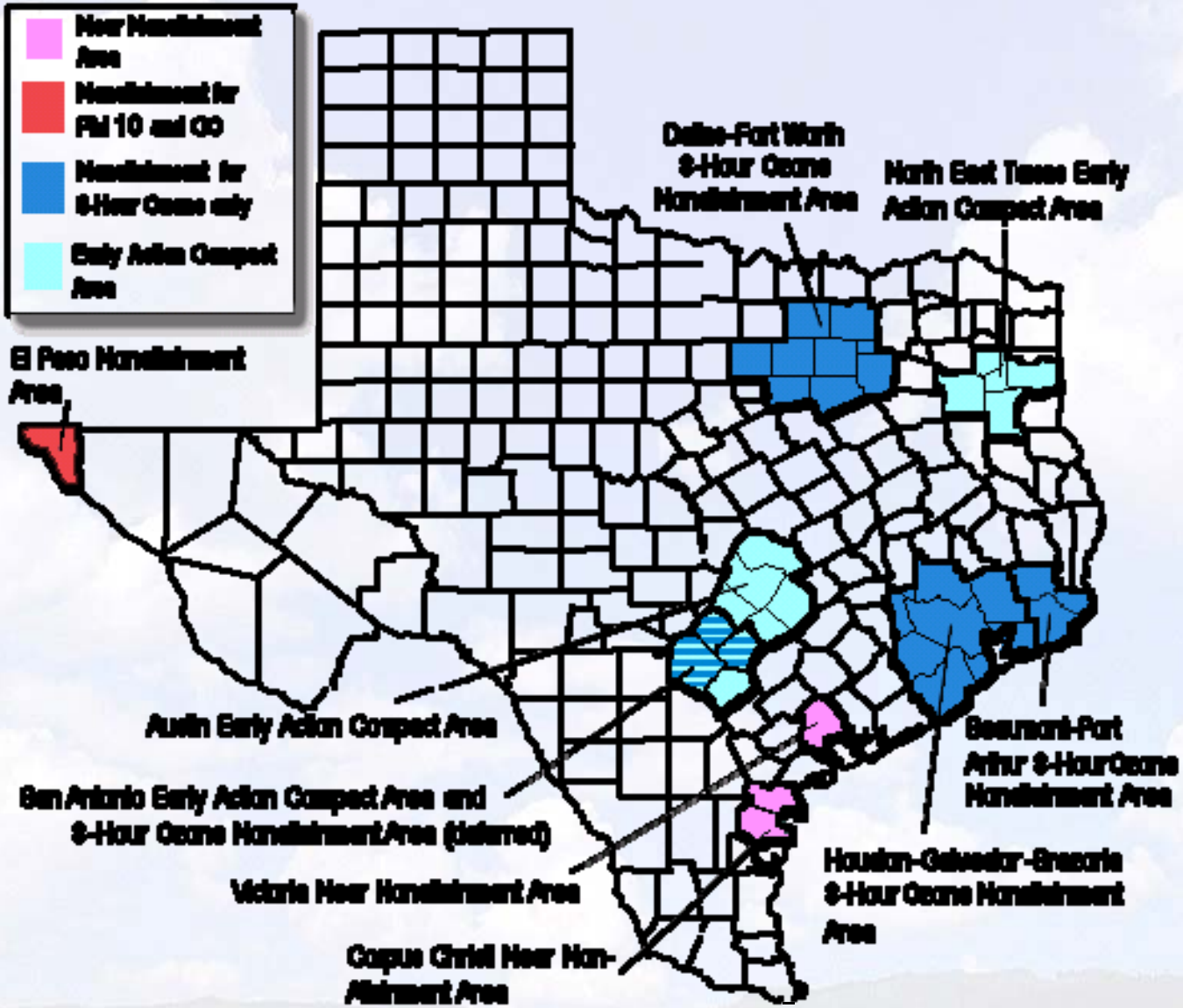
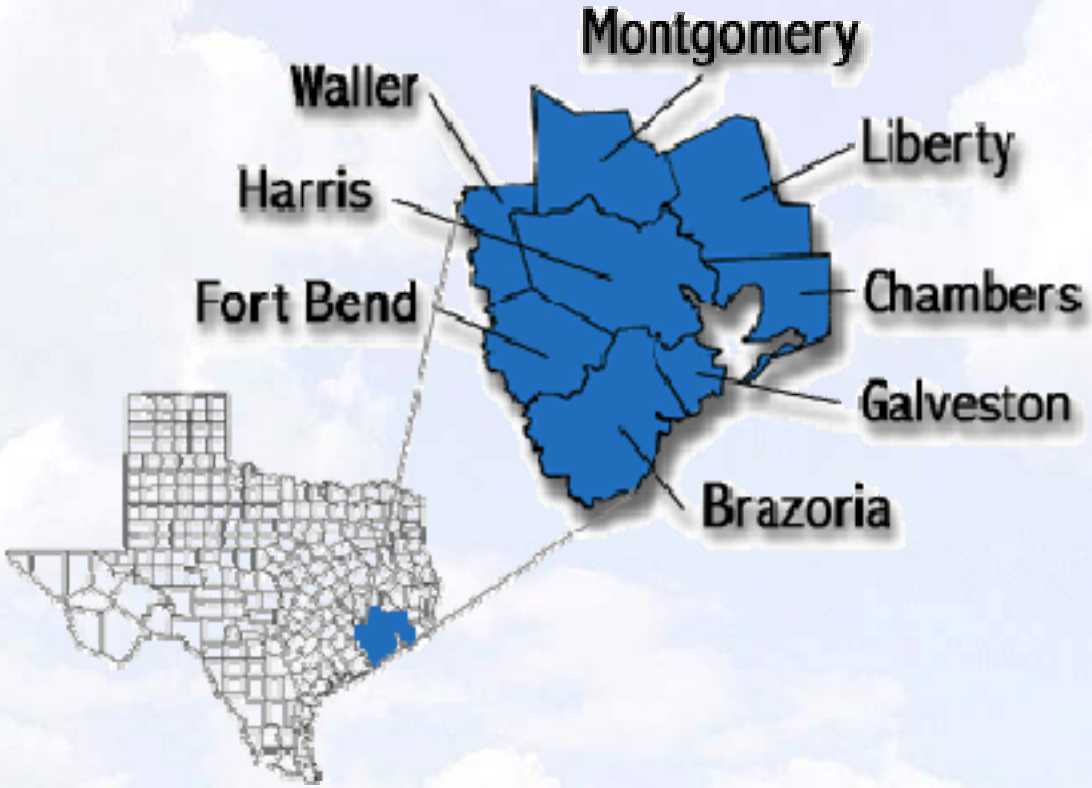
Texas Air Quality Planning

- Houston's 1-hour Plan
  - Mass Emissions Cap & Trade Program
- Houston's 8-hour Plan
- Air Quality Modeling
- Texas Emissions Reduction Plan
- Challenges

Texas' Nonattainment and Near Nonattainment Areas



Houston-Galveston-Brazoria Area



Existing HGB Control Strategies

Major point source NOx reduced 80%	Low emission diesel in east and central Texas
Highly Reactive Volatile Organic Compounds (HRVOC) site-wide cap and monitoring and testing requirements	Vehicle inspection/maintenance
Stationary diesel engine requirements	Speed limit reduction
Gas-fired heaters and small boilers	Transportation control measures
Variety of VOC regulations	Voluntary Mobile Emission Reduction Program
Airport Ground Support Equipment (GSE) electrification	Portable fuel containers (statewide)
Texas Emissions Reduction Plan (TERP)	

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Texas Emissions Reduction Plan (TERP)	

Mass Emissions Cap & Trade Program (MECT)

Program Applicability

- Cap and trade program only applies to the Houston/Galveston nonattainment area
- NOx emitting stationary facilities subject to an ESAD rate in 30 TAC 117.106, 117.206, or 117.475
- Major sources of NOx as defined in 30 TAC Chapter 117.10; or with a collective uncontrolled design capacity equal to or greater than 10 tons of NOx per year

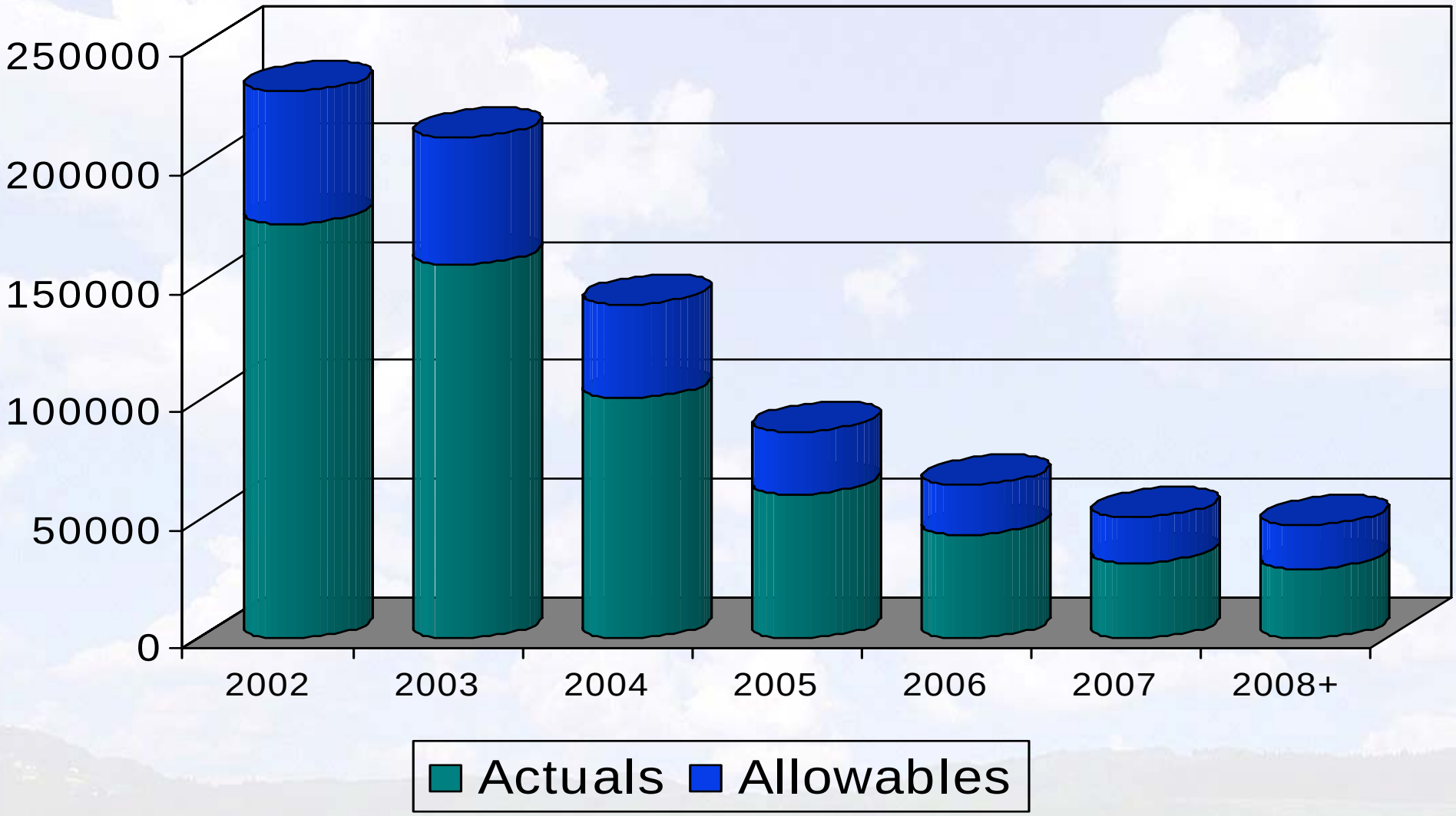
Mass Emissions Cap & Trade Program

Program Participation

Category	Number
Active Sites	356
Brokers	15
Total Participants	371
Sites Submitting ECT-1	345
Sites Submitting ECT-3	322
% of Active Sites with a ECT-1	94.4%
% of Sites with ECT-3 & ECT-1	93.5%
Sites Participating in a Trade	174
% of Sites with a Trade	46.9%

Mass Emissions
Cap & Trade Program

Allowance Allocations



Mass Emissions Cap & Trade Program

Utility Facilities	
Facility	**80% ESAD**
Gas Fired Boilers	0.030 lb/MMBtu
Coal or Oil-fired Boilers	0.045 - 0.050 lb/MMBtu
Auxiliary Steam Boilers	0.030 lb/MMBtu
Stationary Gas turbines	0.032 lb/MMBtu

Mass Emissions Cap & Trade Program

Non-Utility Facilities		
Facility	Attribute	80% ESAD
Gas Fired Boilers > 2 MMBtu	≥ 100 MMBtu	0.020 lb/MMBtu
	≥ 40 MMBtu	0.030 lb/MMBtu
	< 40 MMBtu	0.036 lb/MMBtu
Fluid Catalytic Cracking units		a) 40 ppmv of NOx b) 90% NOx red
BIF	>100 MMBtu	0.015 lb/MMBtu
	<100 MMBtu	a) 0.030 lb/MMBtu b) 80% red
Coke Fired Boilers		0.057 lb/MMBtu
Wood Fuel-fired Boilers		0.060 lb/MMBtu

Mass Emissions Cap & Trade Program

Non-Utility Facilities (continued)		
Facility	Attribute	80% ESAD
Rice Hull-fired Boilers		0.089 lb/MMBtu
Oil-fired Boilers		2 lb / 1000 gal of oil
Process Heaters > 2 MMBtu	≥ 100 MMBtu	0.025 lb/MMBtu
	≥ 40 MMBtu	0.025 lb/MMBtu
	< 40 MMBtu	0.036 lb/MMBtu
	pyrolysis reactors	0.036 lb/MMBtu
SIC Gas-fired rich burn	Land fill gas	0.60 g NOx/hp-hr
	Others	0.50 g NOx/hp-hr
SIC gas-fired lean burn	Land fill gas	0.60 g NOx/hp-hr
	Others	0.50 g NOx/hp-hr

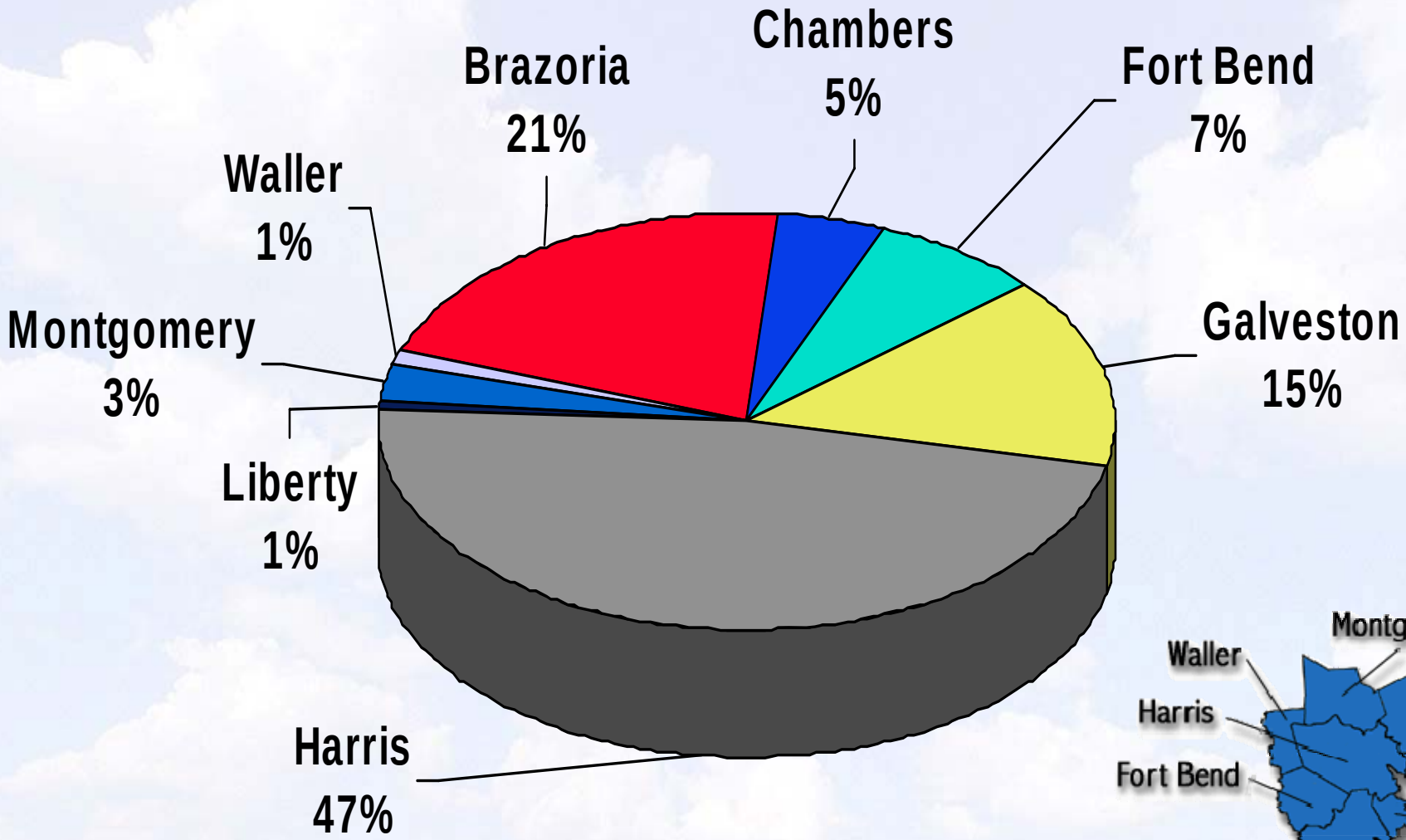
Mass Emissions Cap & Trade Program

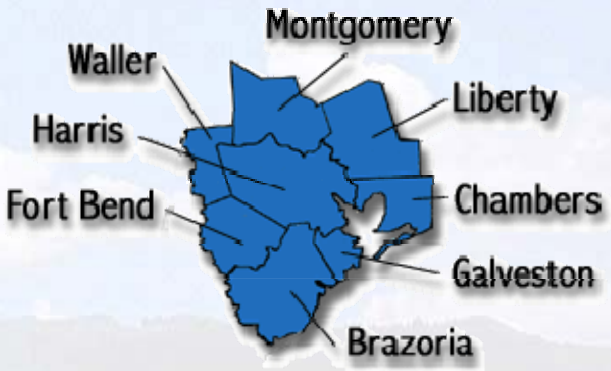
Non-Utility Facilities (continued)		
Facility	Attribute	80% ESAD
SIC dual-fuel	on or before 12/31/00	5.83 g NOx/hp-hr
	after 12/31/00	0.50 g NOx/hp-hr
Stationary Gas turbines	≥ 10 MW	0.032 lb/MMBtu
	≥ 1 MW	0.15 lb/MMBtu
	< 1 MW on or before 12/31/2000	0.26 lb/MMBtu
	< 1 MW after 12/31/00	0.26 lb/MMBtu
Duct burners used in Turbine exhaust ducts		corresponding gas turbine ESAD
Pulping Liquor recovery furnaces		a) 0.050 lb NOx/ b) 1.08 lb NOx / ADTP

Mass Emissions
Cap & Trade Program

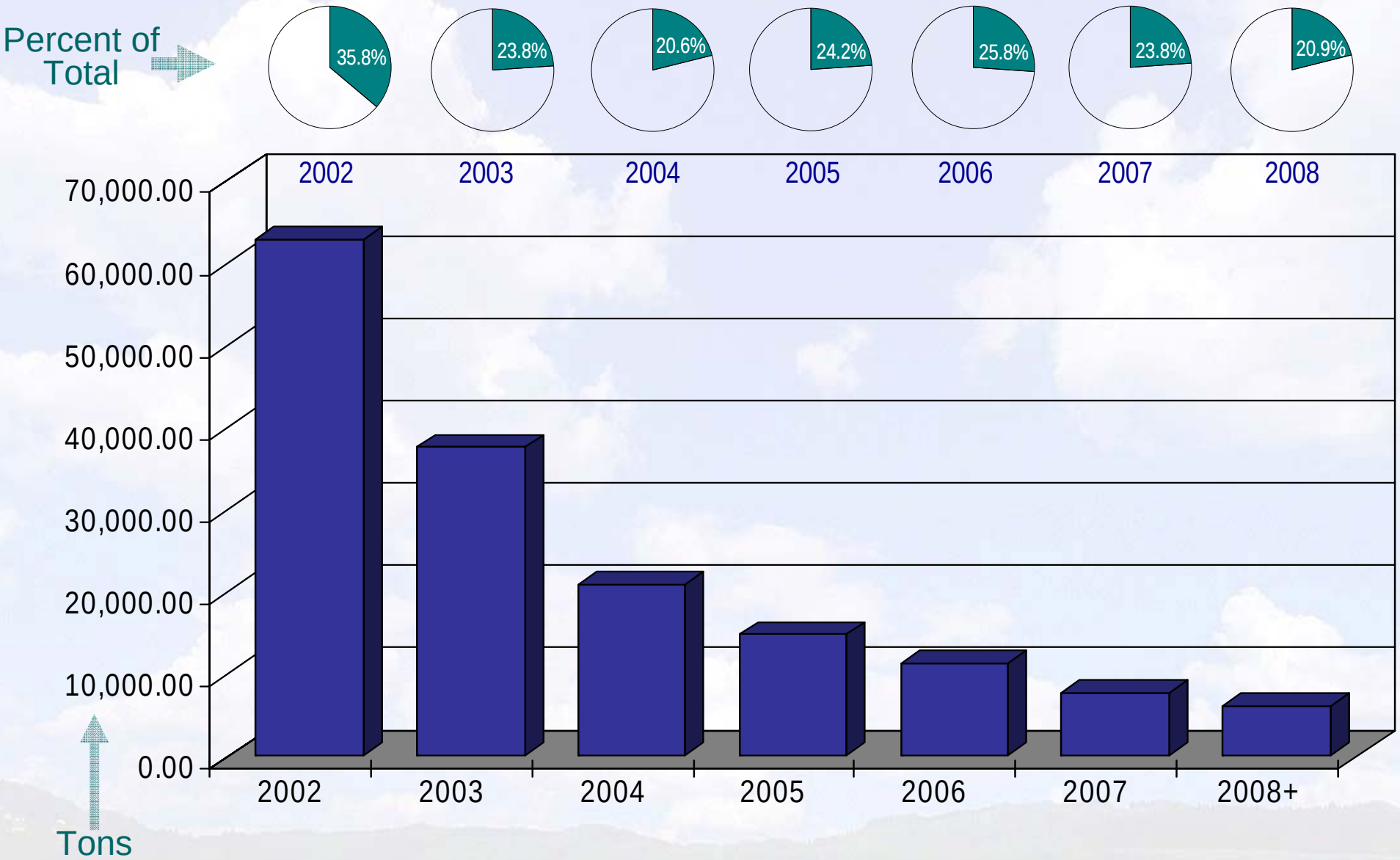
Non-Utility Facilities		
Facility	Attribute	80% ESAD
Kilns * Still on 90% schedule		
	Lime	0.66 lb / ton CaO
	Lightweight aggregate	1.25 lb / ton product*
Metallurgical furnaces		
	Heat treating	0.087 lb/MMBtu
	Reheat	0.062 lb/MMBtu
Magnesium chloride fluidized bed dryers		90% red
Incinerators	> 40 MMBtu	a) 80% red b) 0.030 lb lb/MMBtu
Annual Capacity factor of 0.0383 or less		0.060 lb/MMBtu

MECT Program Data:
Allocations by County, 2004

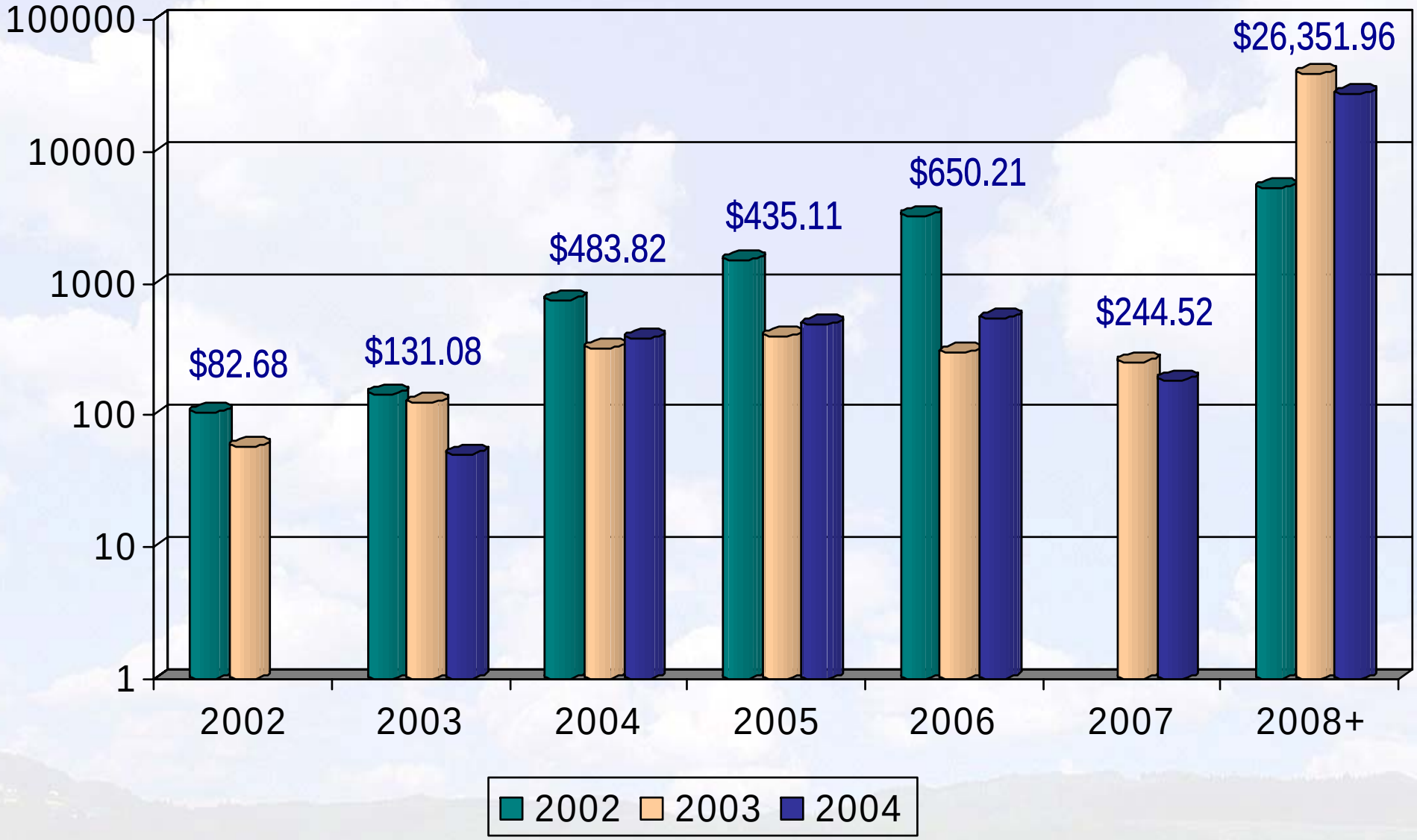




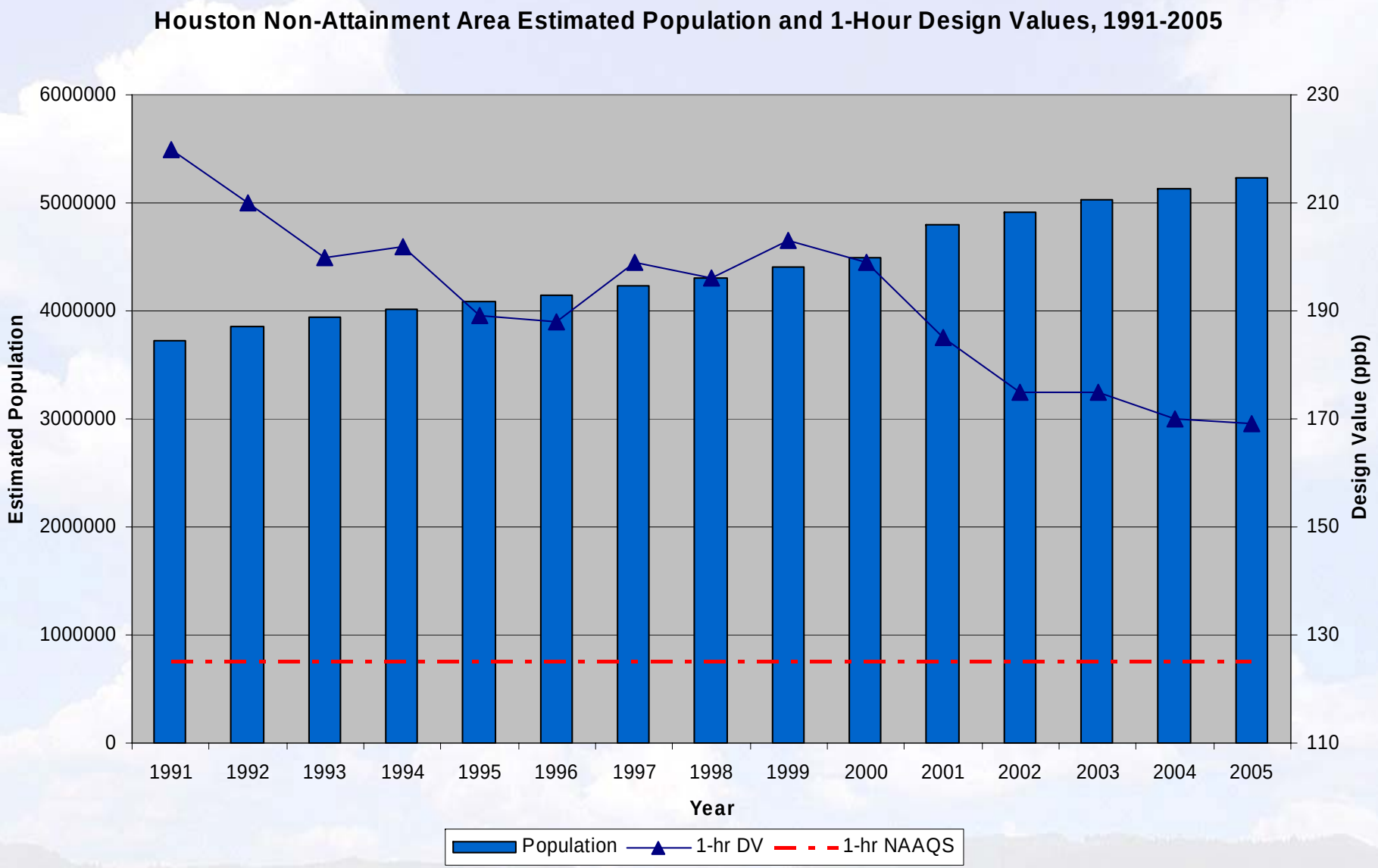
MECT Program Data:
Tons Traded, by Allowance Year



MECT Program Data:
Average Price per Ton

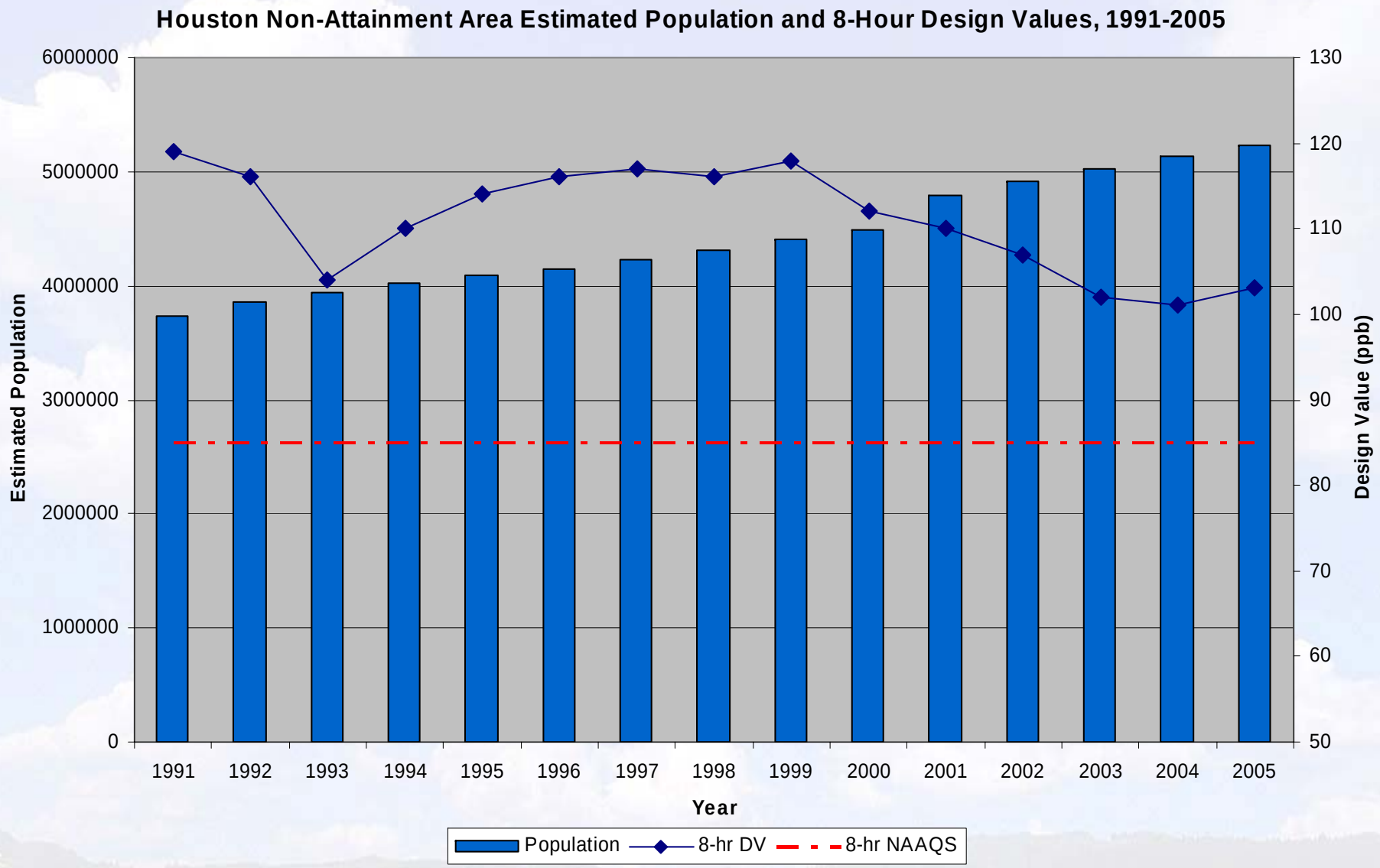


Houston Area
1-Hour Ozone Trends



Source: Ozone -- EPA and Mother database
Population --http://www.census.gov/popest/archives/1990s/MA-99-03b.txt and http://www.census.gov/popest/counties/CO-EST2005-01.html, July 10, 2006

Houston Area
8-Hour Ozone Trends



Source: Ozone -- EPA and Mother database
Population --http://www.census.gov/popest/archives/1990s/MA-99-03b.txt and http://www.census.gov/popest/counties/CO-EST2005-01.html, July 10, 2006

HGB Attainment

- 8-hour ozone standard designation: Moderate
- Attainment deadline: June 15, 2010
- Attainment demonstration: Ozone season 2009
- Control strategy compliance dates: Prior to ozone season 2009

Current SIP Timeline

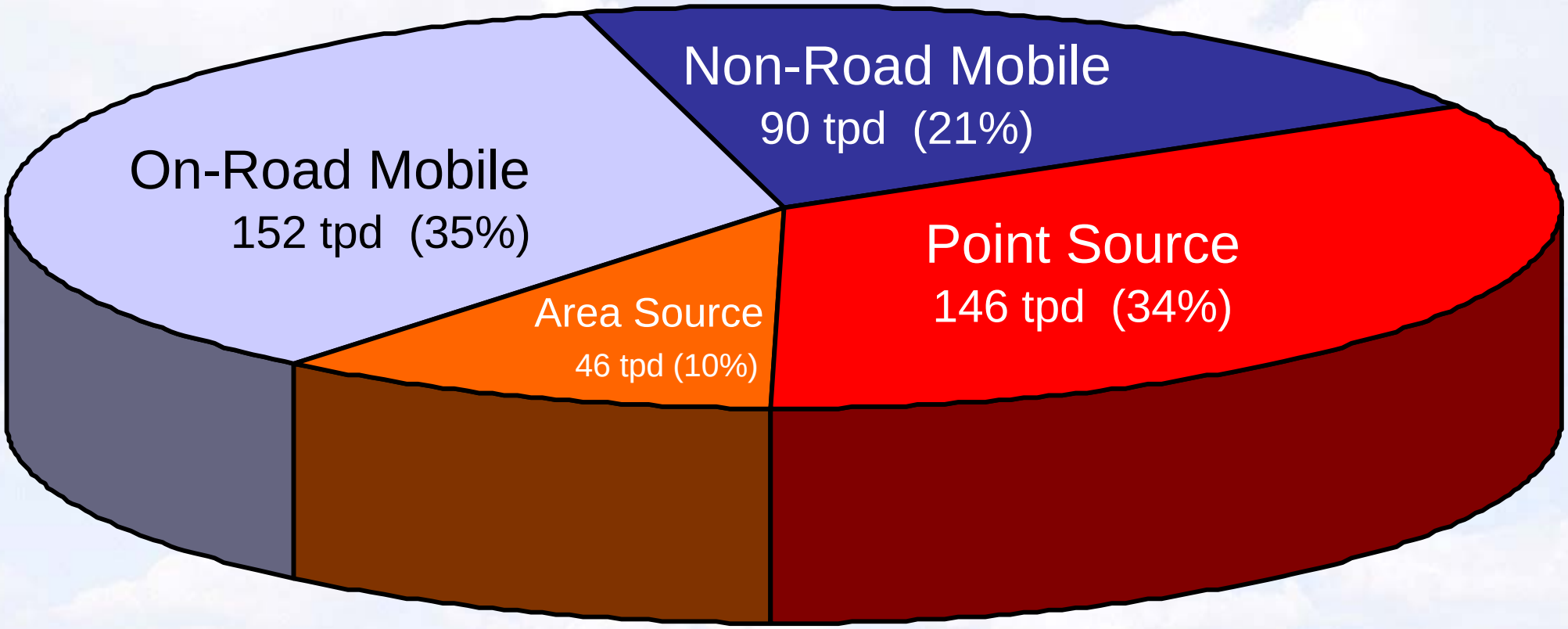
HGB Nonattainment Area

Task	End Date
Stakeholder meetings to present technical work to date	March - June 2006
Additional stakeholder meetings regarding draft rules as needed	August - September 2006
Control strategy development, including sensitivity and control strategy modeling runs	August 2006
Rule development	September 2006
Stakeholder information meetings	October 2006
Draft proposal published on agency web site	November 2006
SIP proposal/opportunity for official public comment	December 2006
Proposal published on agency web site	April 2007
SIP Adoption	May 2007
Submit SIP to EPA	June 2007

Note: Dates are estimates and are subject to revision.

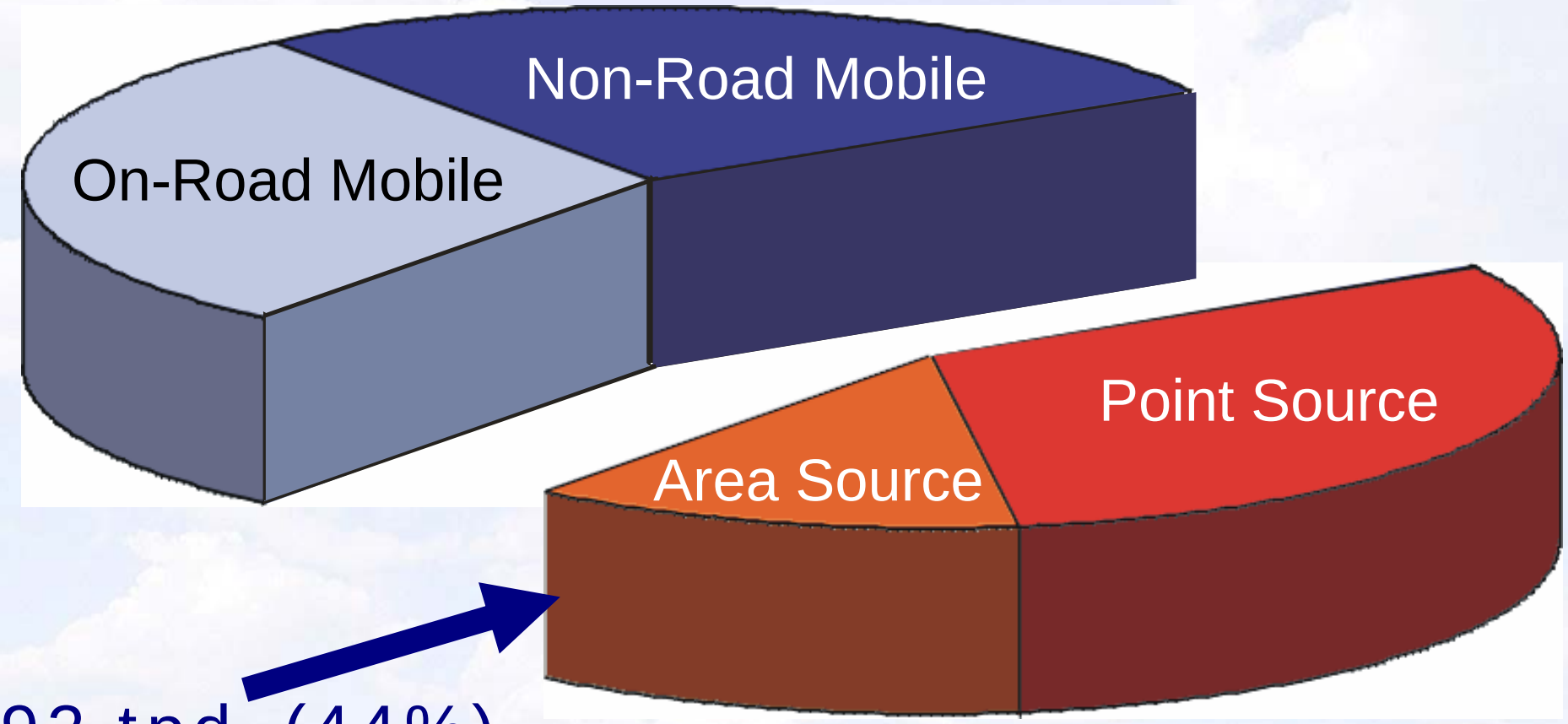
HGB 2009 Emissions Inventory

NOx: Source Category Estimates



HGB 2009 Emissions Inventory

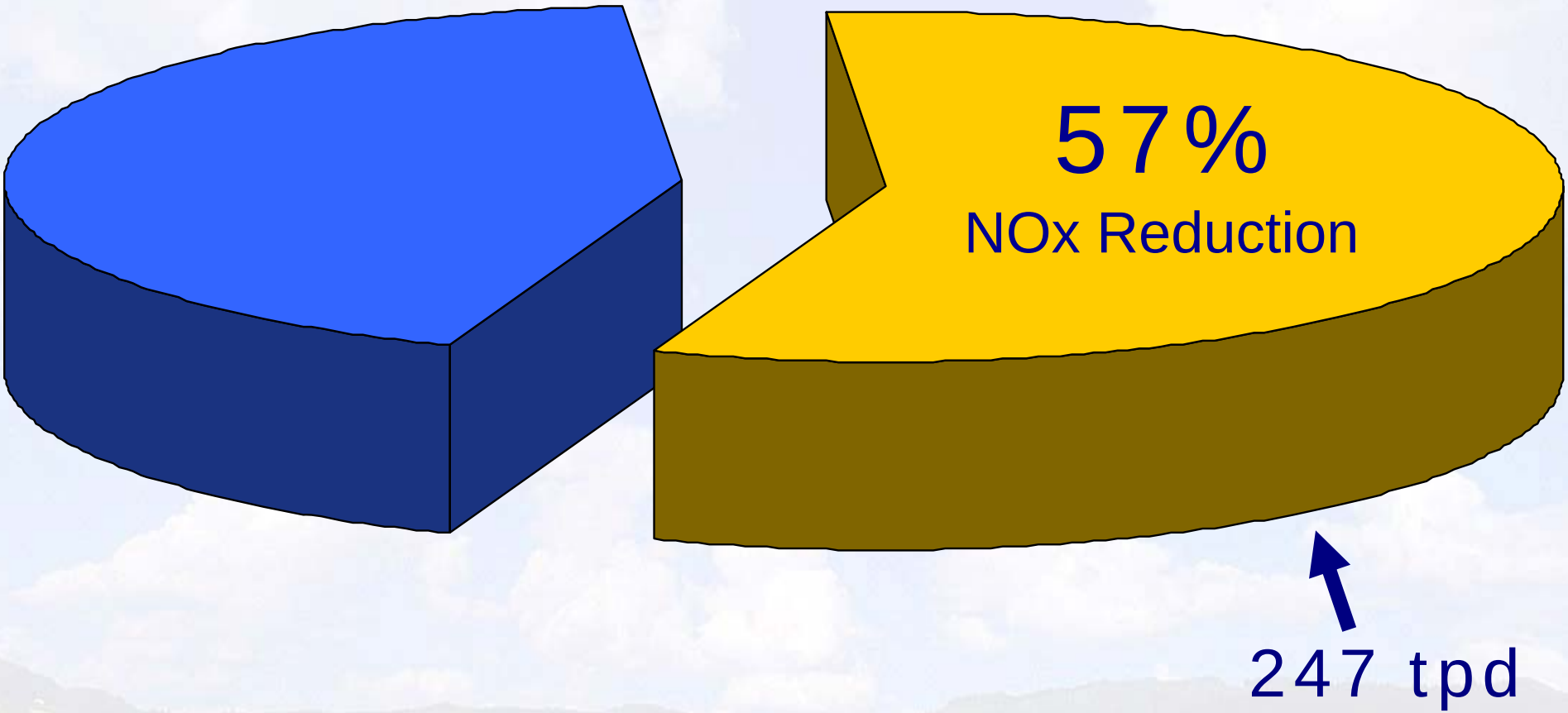
HGB NOx Sources Directly Regulated by TCEQ



192 tpd (44%)

HGB 2009 Emissions Inventory

Estimate of HGB NOx Reductions Needed



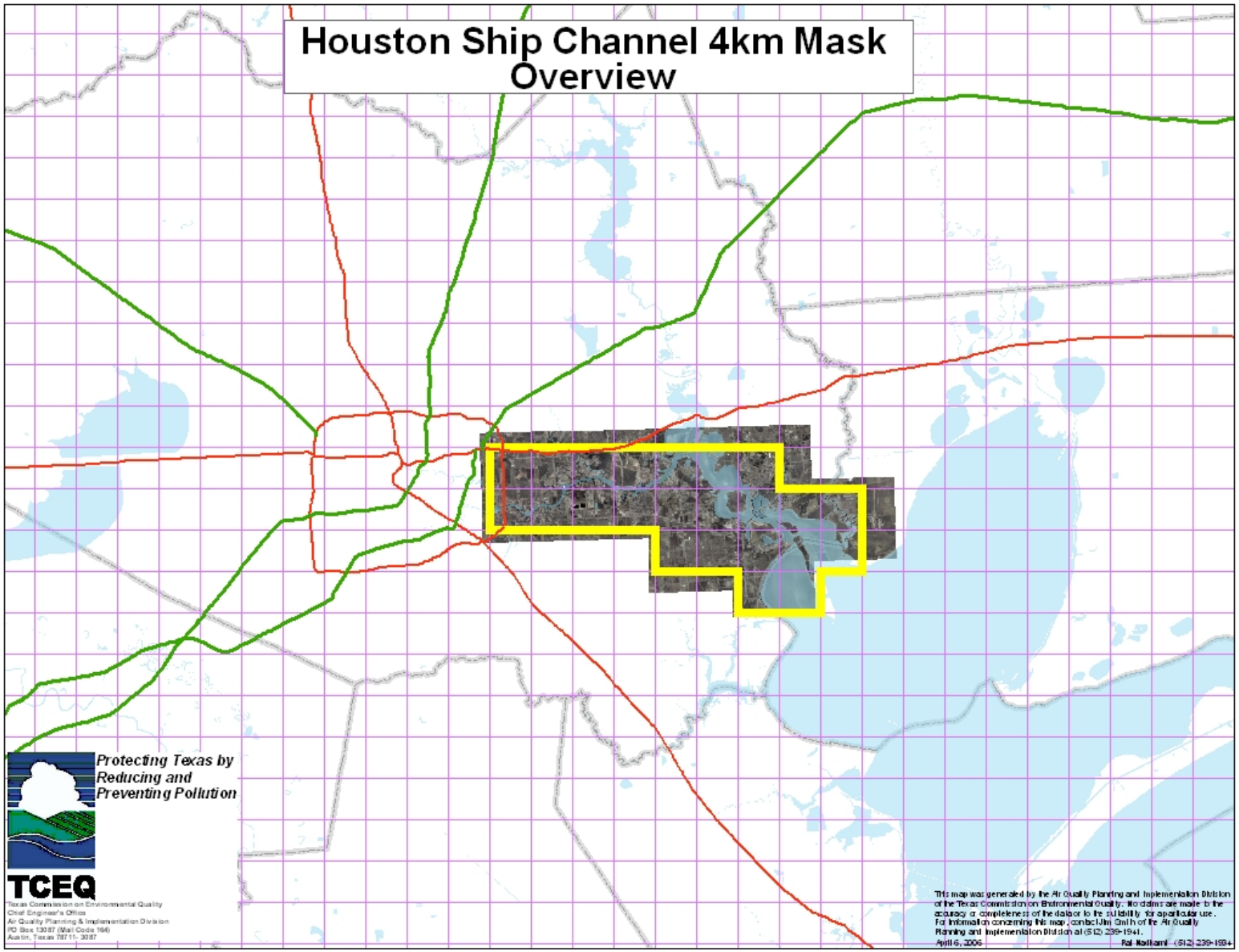
Ship Channel Point Source Zero-Out Run

- Purpose
  - Estimate 2009 future ozone design values (DVf) assuming all Ship Channel point source emissions were removed
- Method
  - Zero-out all 2009 point source emissions (including shipping emissions) in the Ship Channel area
  - Other sources in the Ship Channel area (locomotives, trucks, etc.) were left at their 2009 emission levels
  - Compare model results with unmodified 2009 future base

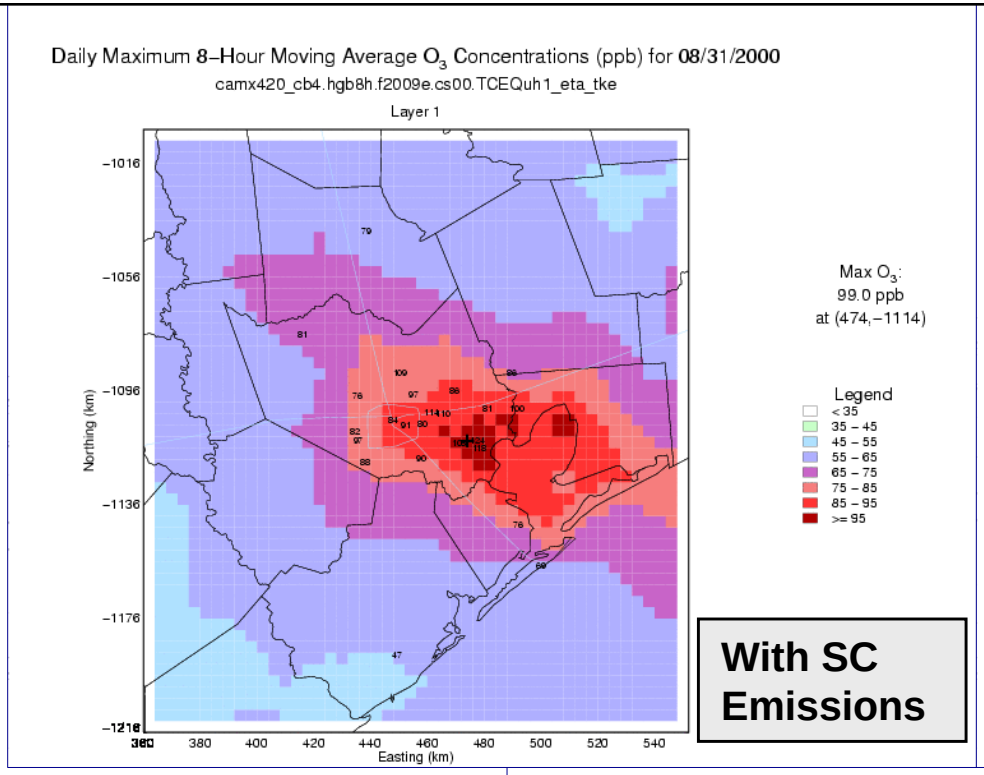
Ship Channel Point Source Zero-Out Run

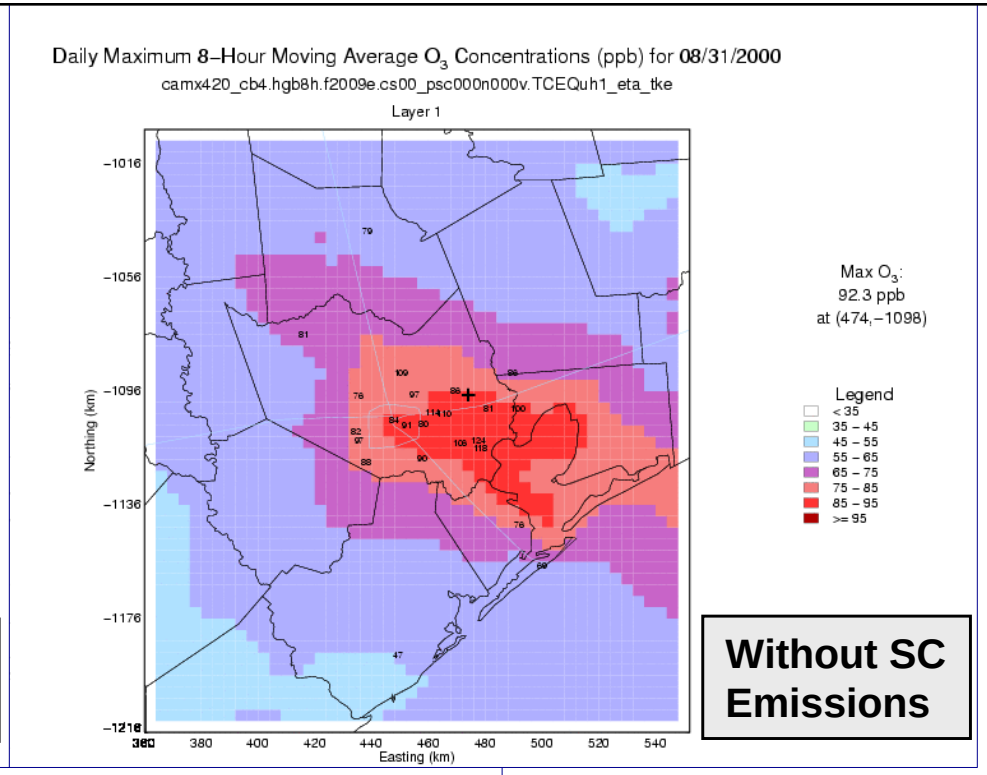
- Emission reductions due to zeroing out Ship Channel point sources+ships:
  - 69 tpd of NO_X
    - ~ 73% of Harris County, point+ship NO_X emissions
    - ~ 26% of Harris County anthropogenic NO_X emissions
    - ~ 16% of HGB 8-county area anthropogenic NO_X emissions
  - 109 tpd of VOC
    - ~ 75% of Harris County, point+ship VOC emissions
    - ~ 29% of Harris County anthropogenic VOC emissions
    - ~ 21% of HGB 8-county area anthropogenic NO_X emissions

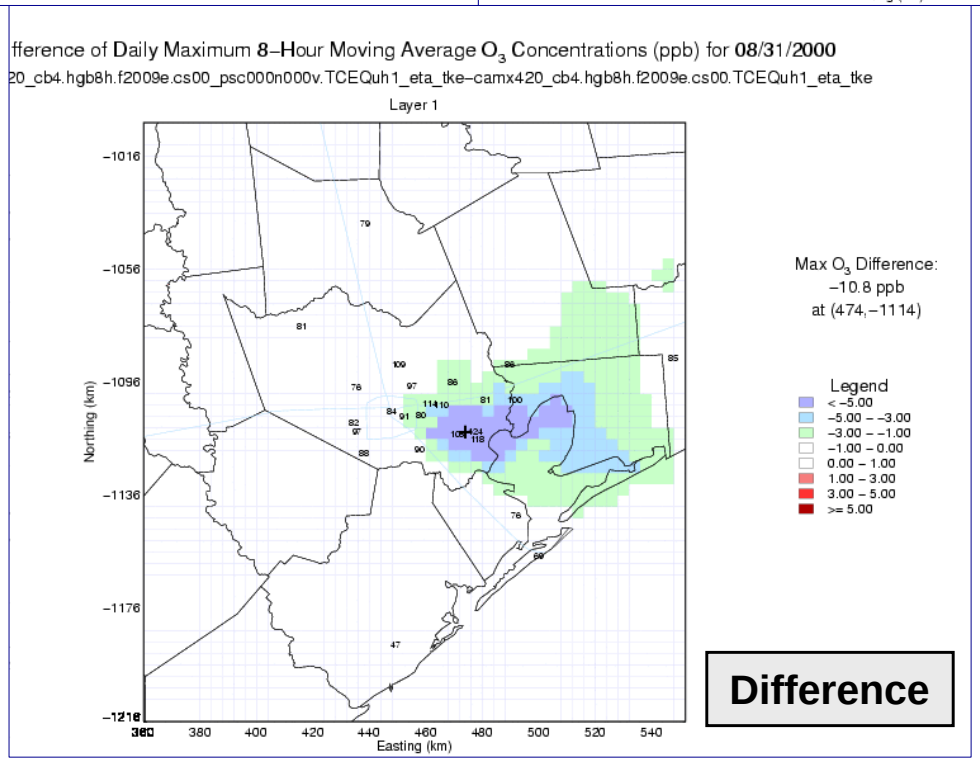
Area with Zeroed-Out Point Sources



Area with Zeroed-Out Point Sources

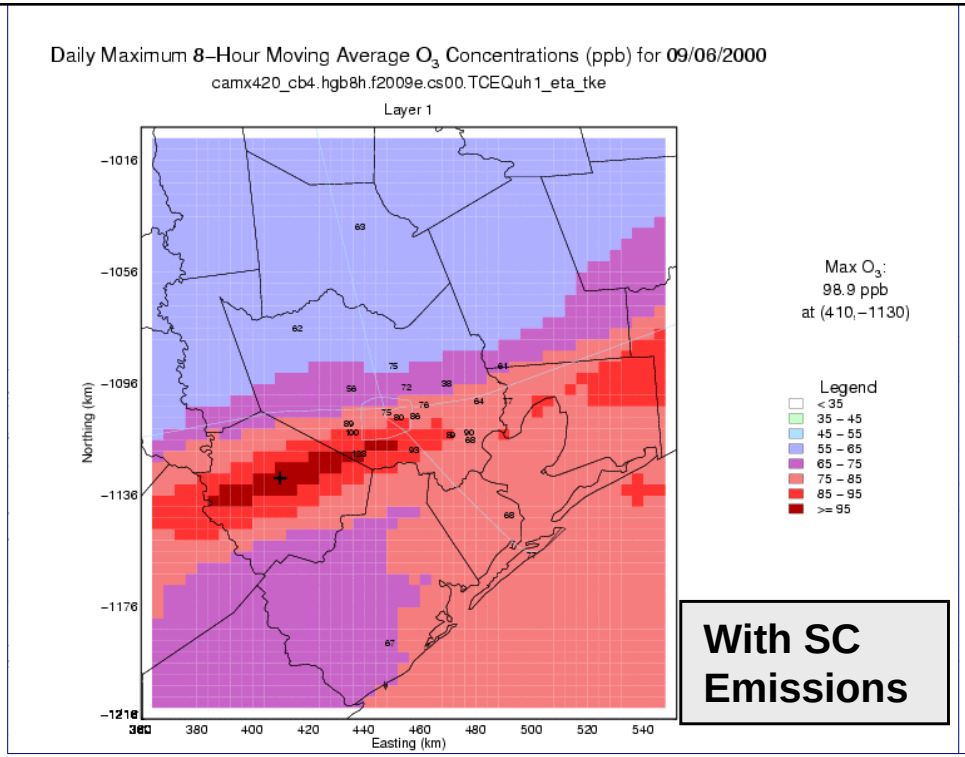


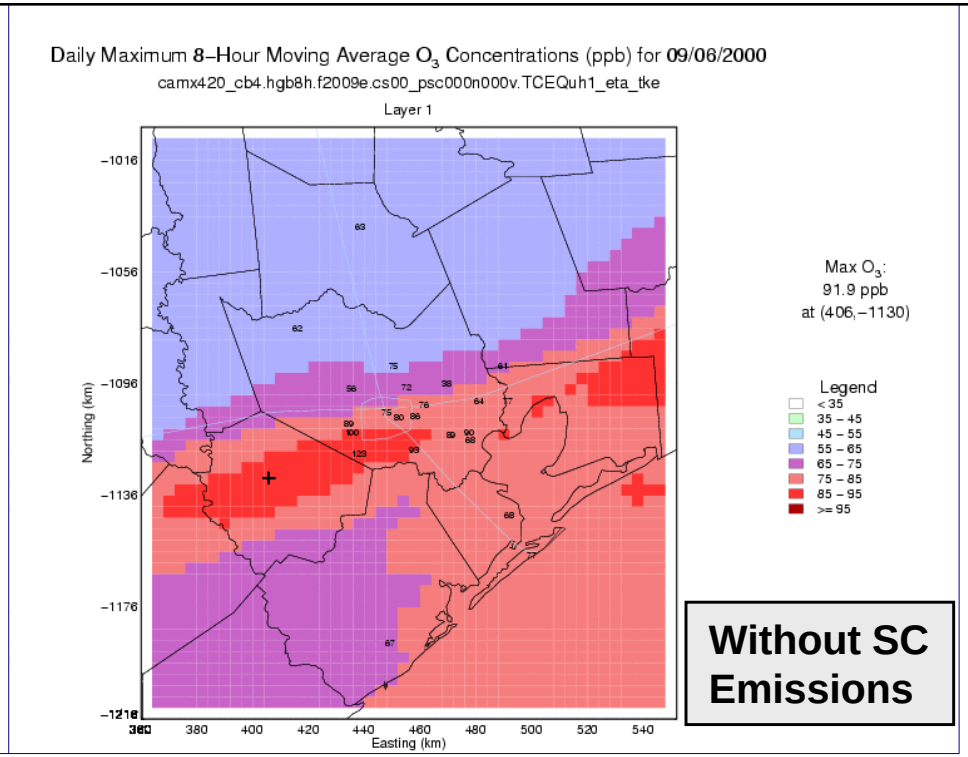




August 31

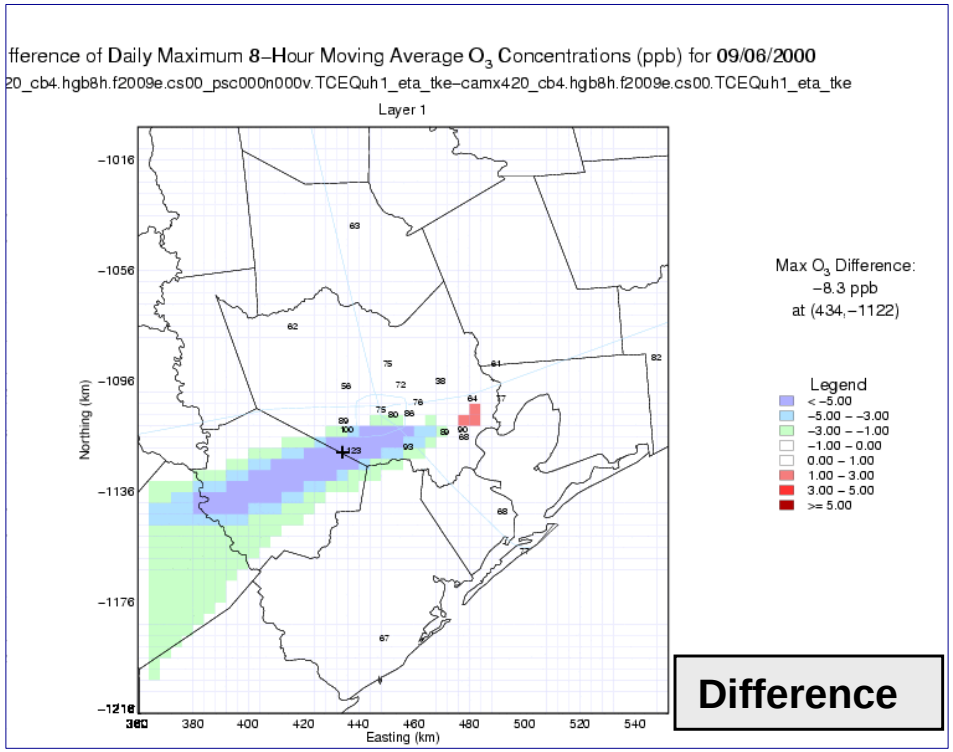
Removal of Ship Channel Point Source Emissions





September 6

Removal of Ship Channel Point Source Emissions



Design Value Changes After Ship Channel Zero Out

Monitor	2009e Projected Future Design Values (ppb)	
	2009e Baseline	Ship Channel Zero-Out
Bayland Park	95.25	93.57
Deer Park	97.33	91.69
Houston Regional Monitor #8	86.14	80.50
Aldine	92.38	88.51
Croquet	88.78	86.76
Northwest Harris County	86.88	85.16
Houston East	90.14	86.93
Houston Regional Office	85.38	83.15
Westhollow	85.79	84.60

Texas Emissions Reduction Plan (TERP)

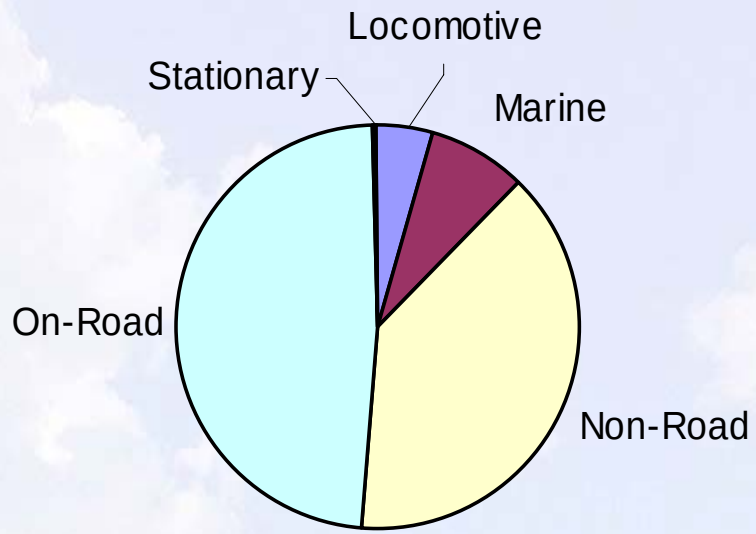
- TERP was created in 2001 by Senate Bill 5
- TERP provides incentives for projects that reduce emissions of nitrogen oxides (NOx) from internal combustion engines
- Projects include purchases, replacements, retrofits, and replacing engines on heavy duty trucks, equipment, locomotives, and marine vessels
- The program may also fund infrastructure, including fueling equipment and locomotive and truck idle reduction systems

TERP Results

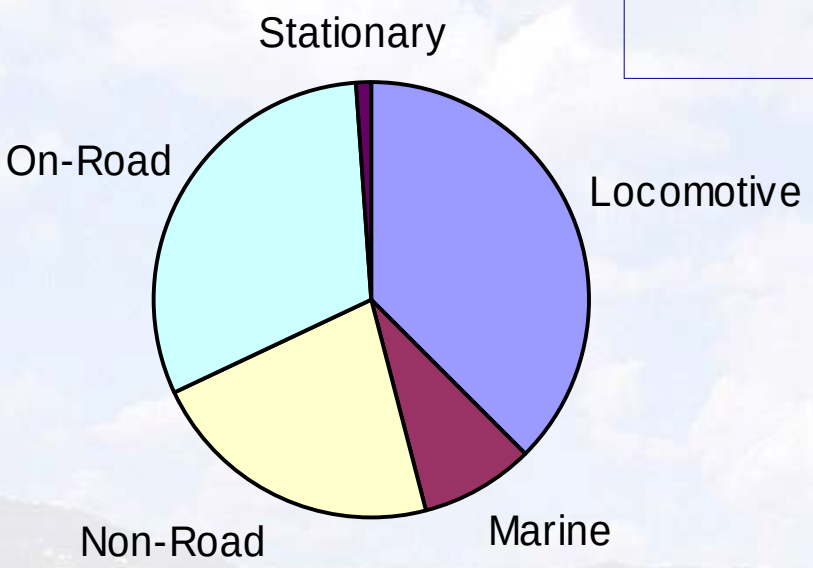
- As of July 31, 2006,
  - Over 890 projects funded (from over 2,000 applications received and reviewed)
  - Over $336.5 million awarded
  - 75,730 tons of projected NOx emission reductions
  - Approximately 35.3 tons/day of reductions
  - $4,443 average cost to reduce one ton of NOx

TERP Results by Source

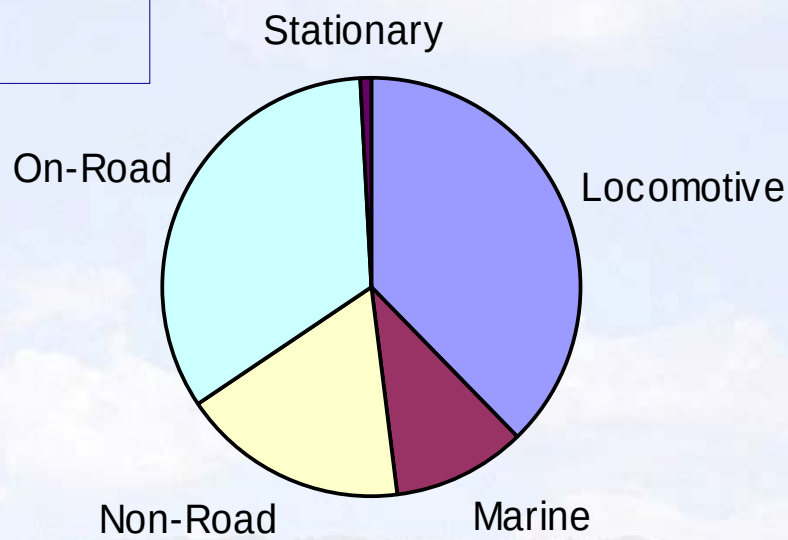
Number of Activities



Grant Amount



Total NOx (tons)



General Challenges

- Magnitude of reductions needed
  - Numerous control strategies were implemented under the 1-hour ozone standard
- Reductions needed in Houston are greater than the amount of emissions that TCEQ directly regulates
  - Existing control strategies at the state level focus on stationary sources

General Challenges

- Difficulty synchronizing control strategies with potential requirements under the EPA Clean Air Interstate Rule, Clean Air Mercury Rule and regional haze
- The state is dependent on the federal government to address emissions from federally pre-empted sources (e.g., mobile sources)

Contact Information

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