



**Air Quality:
Texas' Challenges & Texas' Response**

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Air pollutants of concern in Texas

PM₁₀ and PM_{2.5} - Fine particulate matter suspended in the atmosphere degrades visibility and has been associated with increased rates of mortality

O₃ - Ozone at ground level is an irritant, and is associated with increased incidence of respiratory disease and decreased respiratory function



The Houston-Galveston area is a severe ozone non-attainment area

The current State Implementation Plan (SIP) calls for significant NO_x emission reductions (approximately 70% of the projected 2007 inventory; 90+% for point sources)

SIP also calls for VOC emission reductions (approximately 25% of the projected 2007 inventory)

Costs and benefits of controls have been estimated to be ~5 billion/yr

Are we sure that the air quality plan (State Implementation Plan, SIP) is headed in the right direction?

- Ozone is formed in the atmosphere by the reactions of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x)
- Understanding the appropriate balance between controlling highly reactive VOCs and NO_x can be difficult

Texas Air Quality Study -2000 (TEXAQS - 2000)



(www.utexas.edu/research/ceer/texaqs/)
(www.utexas.edu/research/ceer/texaqsarchive)

Key Findings from Accelerated Science Evaluation (Executive Summary)

- **Finding 1. Almost without exception, air parcels with very high ozone concentrations, observed by aircraft during the Texas Air Quality Study, had back trajectories that indicated a substantial contribution of emissions from industrial source regions. These air parcels also had chemical compositions that were representative of industrial sources, rather than typical urban sources.**

Key Findings from Accelerated Science Evaluation (Executive Summary)

- **Finding 2:** The rate of ozone production in and around the industrial source dominated areas in Houston can be very high, commonly exceeding 50 ppb/hr, and at times approaching instantaneous rates of 200 ppb/hr.
- **Finding 5.** The high rates and high efficiencies of ozone production in the industrial plumes are driven by high concentrations of reactive hydrocarbons in the presence of NO_x .

Key Findings from Accelerated Science Evaluation (Executive Summary)

- **Finding 6. Industrial hydrocarbon emissions are significantly underestimated.** Measurements of the ratios of hydrocarbons to NO_x in the industrial plumes were consistently factors of 3-10 higher, and in some isolated instances even a factor of 100 or more higher, than the ratios reported in the inventories.

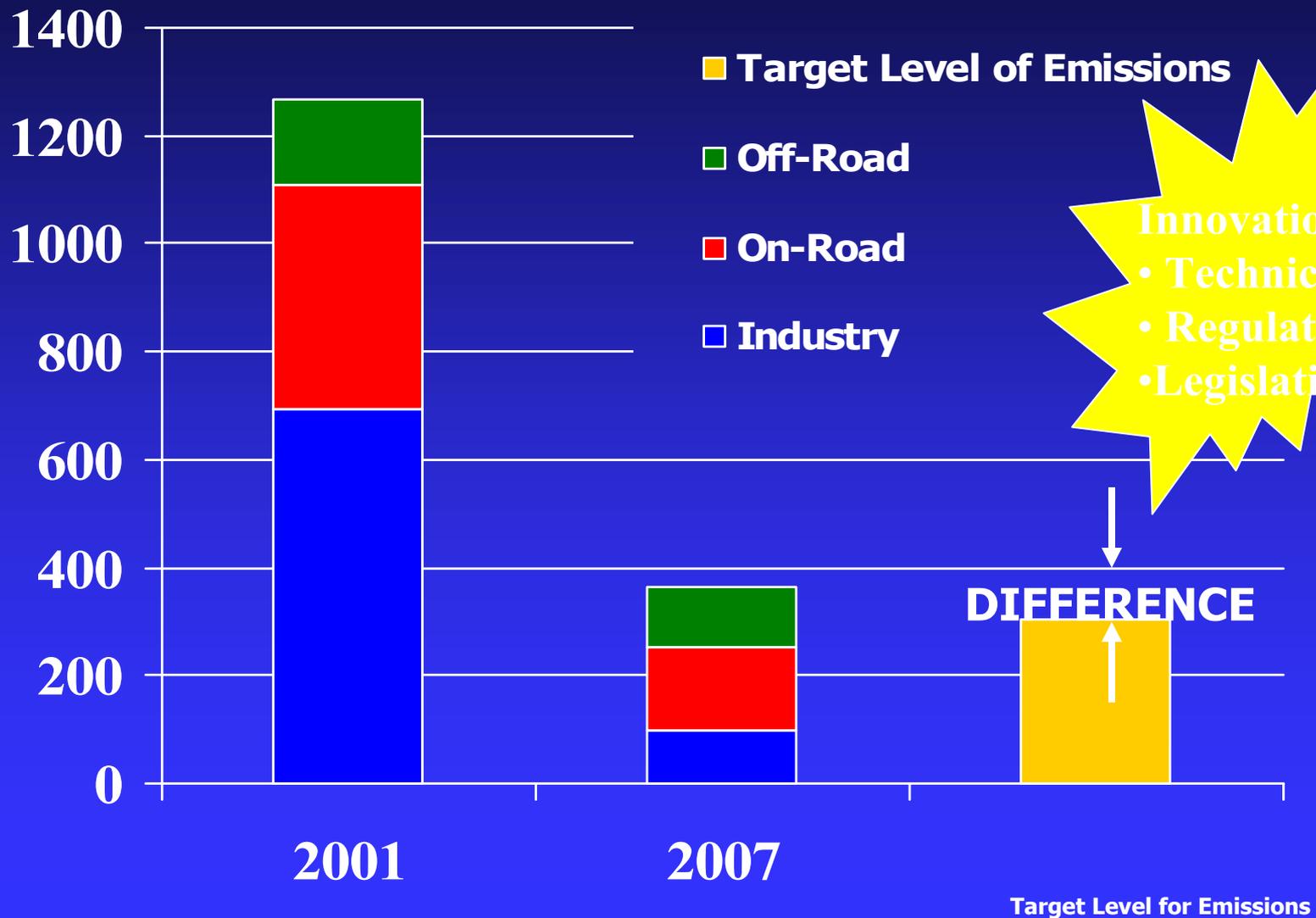
Actions taken by the TCEQ

- Based on the data from TexAQS, which indicate that VOC emissions from industrial facilities are important and underestimated, new rules have been proposed for emissions of reactive hydrocarbons from flares, cooling towers and fugitive sources
- NO_x emission reductions remain very important, but there is a new focus on HRVOC emissions from industrial facilities

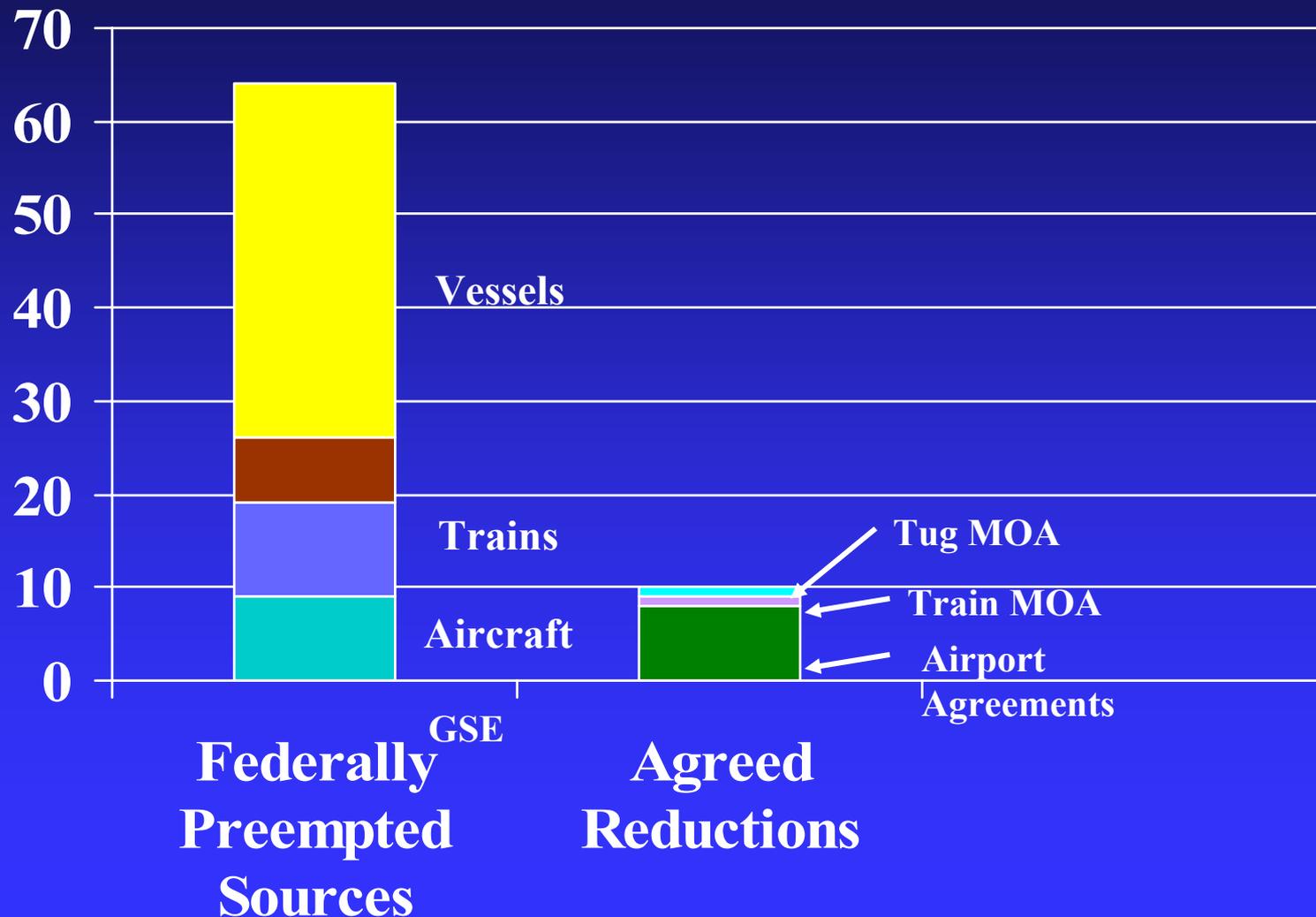
Benefits of TexAQS to the State of Texas

- More effective SIP
- More confidence by policy-makers in the decision making process
- Demonstration of the value of timely scientific analyses
- Demonstration of the value of federal/state scientific partnerships

The Existing Houston SIP: NO_x Gap



Houston Preempted Sources and Agreed Reductions



What you'll learn in this session

- **What NO_x emission reductions are feasible, using new technologies for mobile sources and stationary combustion sources**
- **What new technologies are available for HRVOCs (Tuesday afternoon session)**
- **How does the EPA certify new technologies**
- **State grants for new technologies**
- **Utility programs for new technologies**