



United States
Environmental Protection Agency
National Association of Clean Air Agencies
December 11, 2014
Session 8:30am – 9:30am



Roadmap for Today

- National Enforcement Priorities for Air (8:30am-9:30am)
- Emerging Enforcement Areas and Future Priorities in Air Toxics (10:00 – 12:00pm)
- High Priority Violation Policy (1:15pm – 1:45pm).

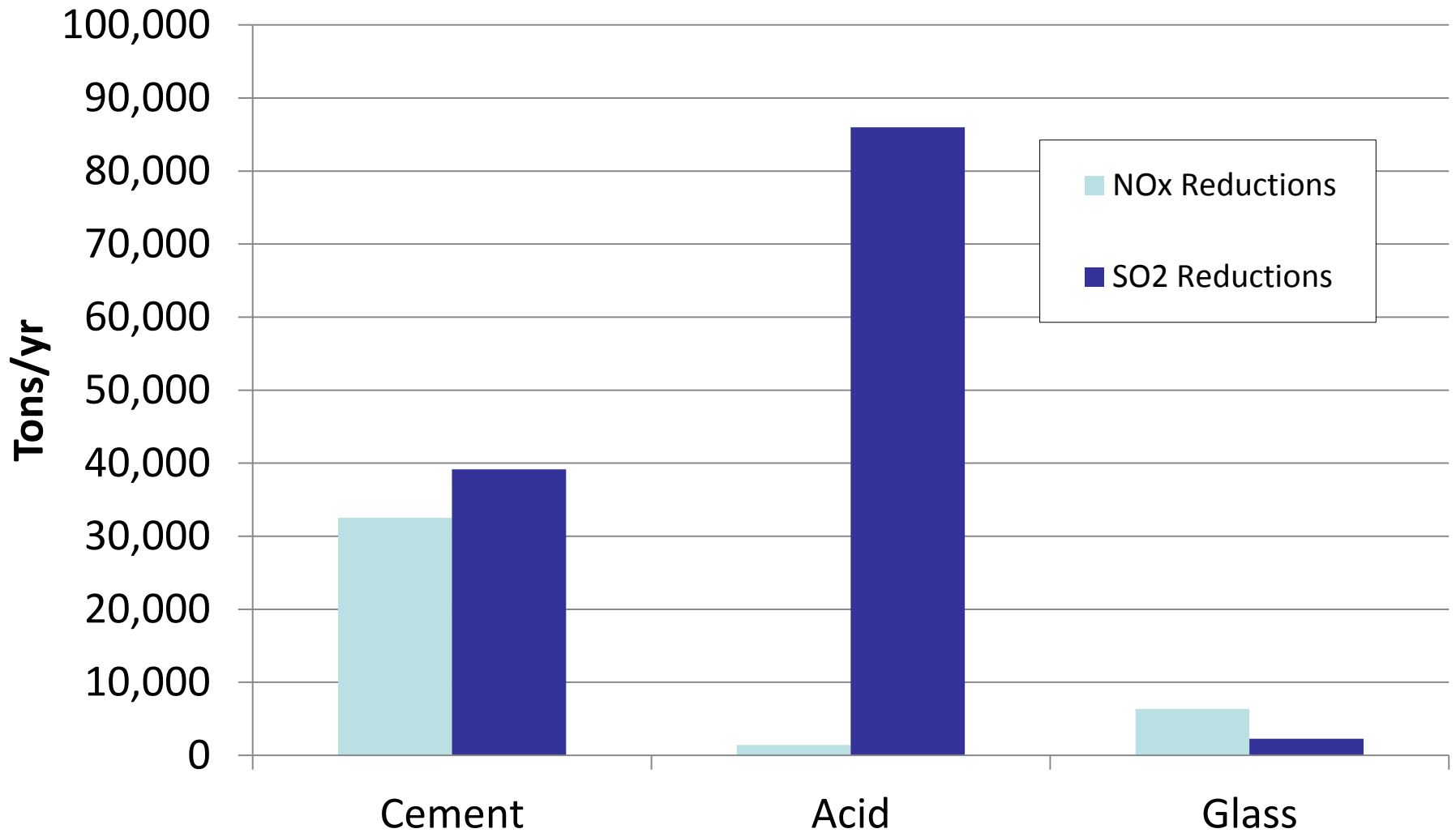
Stationary Source Enforcement

- Currently two national initiatives in AED:
 - New Source Review / Prevention of Significant Deterioration
 - Power Plants
 - Acid Plants
 - Cement Plants
 - Glass Plants
 - Air Toxics
 - Flaring
 - Leak Detection and Repair
 - Excess Emissions

New Source Review (NSR)



Acid Cement and Glass Settlements - Reductions Since 2006



Acid Settlements

- 10 Settlements
- 7 of 10 are multi-facility
- 50 acid plants under CD
- 98,600 tons of SO₂ reductions / yr
- 2,300 tons of NO_x reductions / yr
- \$21.6 M penalties paid



- Settled November 6, 2014
- Settlement covers 8 plants located in Louisiana, Florida, and North Carolina
- Estimated \$50 million injunctive relief to comply with stringent short-term and long-term SO₂ emission rates and install continuous emission monitors
- Approximately 12,600 tons per year of SO₂ reduced
- \$1.3 million civil penalty
- \$2.5 million SEP (Installation of SCR on a co-located nitric acid plant in Louisiana)

* The settlement includes PSC Nitrogen Fertilizer, AA Sulfuric Acid Inc. and White Springs Agricultural Chemicals, Inc. Potash Corporation of Saskatchewan (PCS) is the parent corporation of the three companies and is the largest manufacturer of fertilizer in the world.

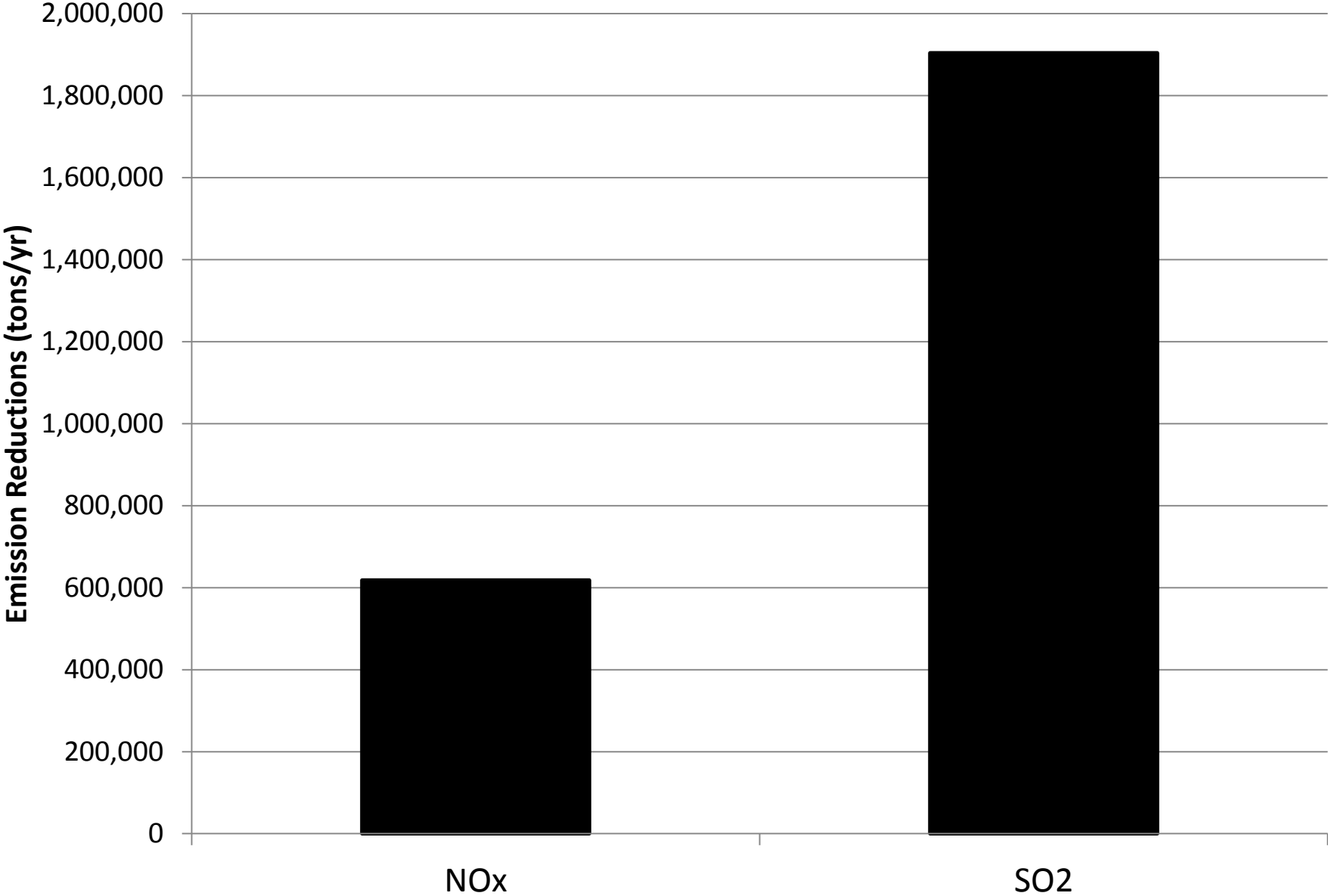
Cement Settlements

- 9 Settlements
- 3 of 9 are multi-facility
- 34 cement plants under CD
- 39,000 tons of SO₂ reductions / yr
- 32,500 tons of NO_x reductions / yr
- \$16.6 M penalties paid

Glass Settlements

- 3 Settlements
- 2 of 3 are multi-facility
- 22 glass plants under settlement
- 2,200 tons of SO₂ reductions / yr
- 6,300 tons of NO_x reductions / yr
- \$4.9 M penalties paid

Utility Settlements Emission Reductions



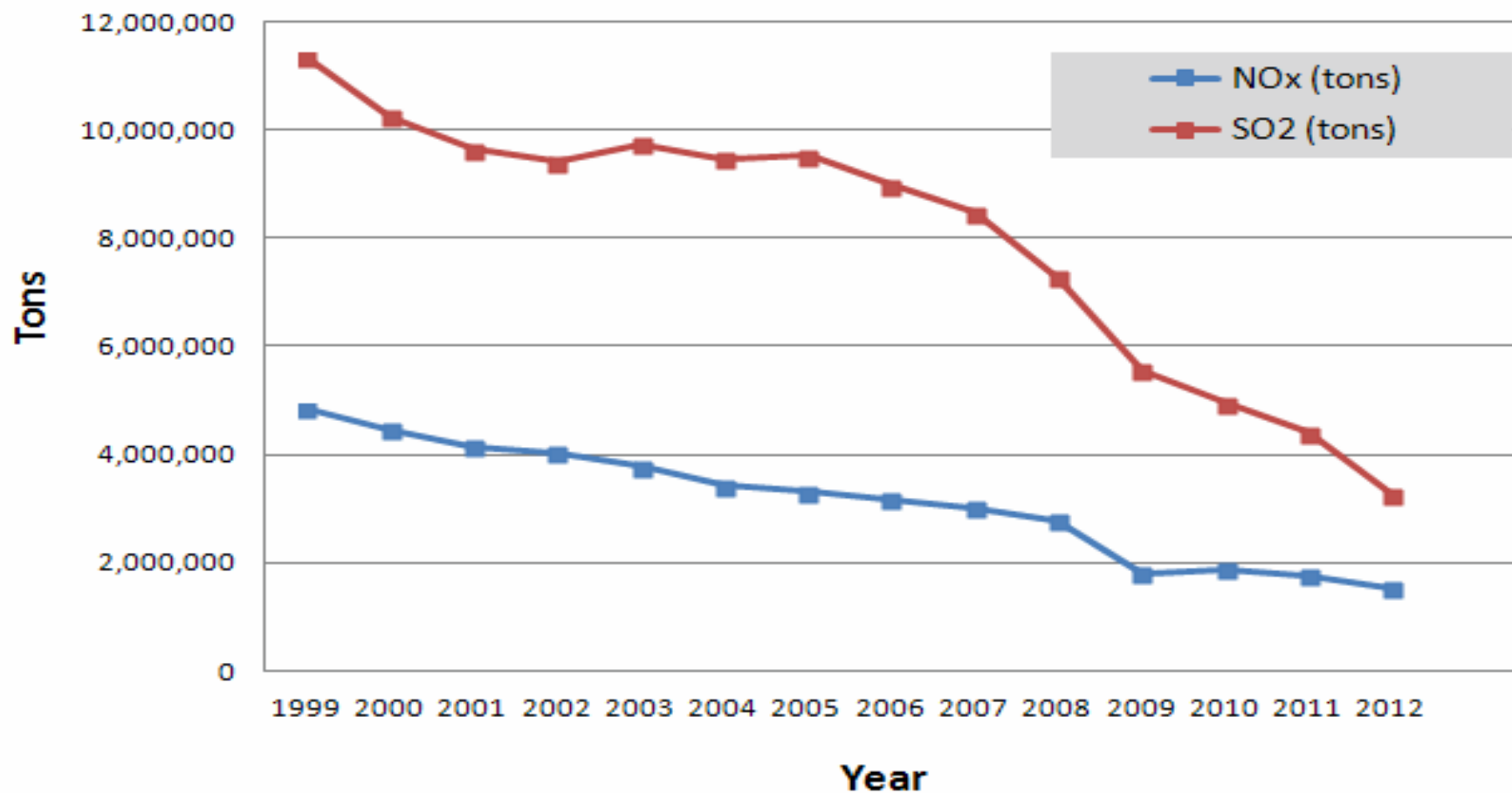
Coal-Fired Utility Settlements

- 29 Settlements
- 20 of 29 are multi-facility
- 92 power plants under settlement
- 1.94 Million tons of SO₂ reductions / yr
- 630,000 tons of NO_x reductions / yr
- \$20.3 Billion in injunctive relief
- \$95 M penalties paid
- \$670 M mitigation projects undertaken

Consumers Energy

- Settled September 16, 2014
- 12 boilers at five plants located in Michigan (~ 2,900 MW)
- >\$1 billion in injunctive relief
 - Installation and continuous operation of SCR on Campbell Units 2/3 and Karn 1/2
 - Installation and continuous operation of FGD on Campbell 3, Karn 1/2
 - Installation of DSI on Campbell 1/2
 - Retirement/refueling of Cobb 4/5, Weadock 7/8, and Whiting 1/2/3
 - Stringent unit-specific NOx and SO2 rates and annual plant tonnage caps
- 46,500 tons per year of NOx, SO2, and PM reduced
- \$7.7M in **mitigation** (vehicle replacement, retrofit and fueling infrastructure; renewable energy development or installation; wood burning appliances; energy efficiency; and land acquisition, donation, and restoration)
- \$2.75M civil penalty

Total NOx and SO2 Emissions from Coal-Fired Utilities



* Emission reductions are not attributable to enforcement alone.

* Data source: EPA Acid Rain Database (<http://ampd.epa.gov/ampd/>).

NSR Outside the Initiatives

Cabot Corporation

Entered April 2014

Injunctive Relief – Covers all three plants.

- Installation of SCR and enforceable NO_x limits at all three plants
- Installation of WGS and enforceable SO₂ limits at its two largest facilities
- Development and implementation of fugitive dust plans at all three plants
- Installation of NO_x and SO₂ CEMS
- Early warning PM leak detection system

Expected emission reductions 14,355 tons of NO_x, SO₂, and PM

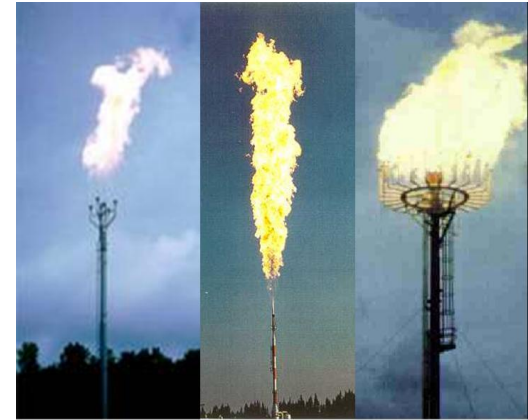
Mitigation (energy efficiency projects in the community)

Civil Penalty -- \$975K

Air Toxics



Why Focus on Flares?



- Two major problems:
 - Combustion of gases with low Btu content, and/or
 - Over-Assisting (steam/other)
- Potentially Causing:
 - Incomplete combustion
 - Significant HAP emissions

Refinery Sector Flare Profile

- 510 flares located at 142 major source domestic refineries (2011 ICR)
 - 79% are steam-assisted, 12% are air-

Flare Assist Type	All Refinery Flares	# Routine Flares without FGRS
Non-Assisted	49	15
Steam-Assisted	402	163
Air-Assisted	59	36
Total # of Flares	510	214

The Issues

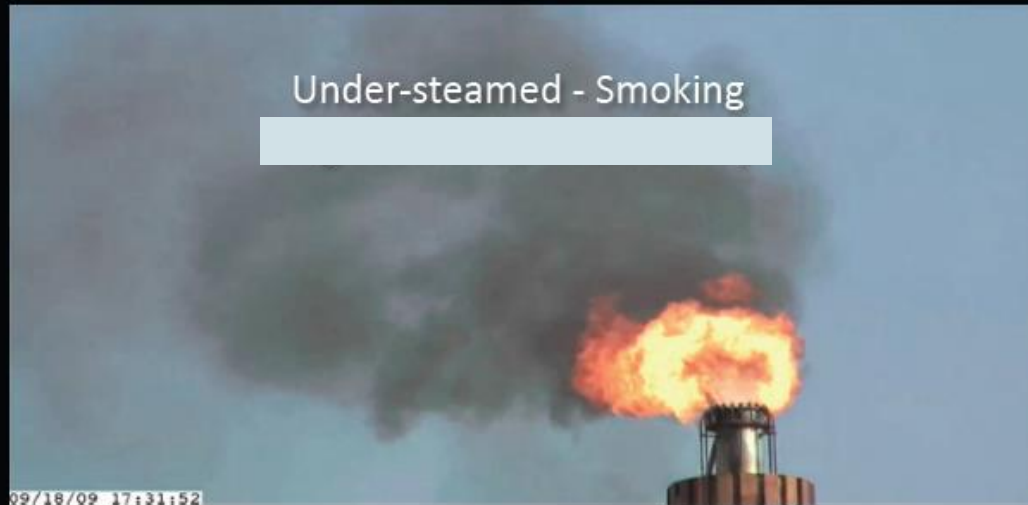
Over-steamed
Low combustion efficiency



Incipient Smoke Point
High combustion efficiency



Under-steamed - Smoking



Quantification With FTIR



- Passive FTIR
 - Can be used to measure emissions from flares
 - Heat from flare is the IR energy source
 - Warm uncombusted hydrocarbons emit IR energy with the same signature as their absorption spectrum
 - The passive system measures the radiance signature (a function of the chemical species, concentration, and temperature) instead of the absorption signature
 - Companies paid for testing.

Major Flare Settlements

Marathon (April 2012)

Injunctive relief covered all of Marathon's six U.S. refineries.

- Established parameters of flare related injunctive relief (flare minimization and combustion efficiency measures).

Mitigation – Sludge Handling Project

Civil Penalty -- \$450k

BP Whiting (May 2012)

Injunctive Relief includes:

- Emission limits on FCCU
- Flare Minimization and Efficiency
- Compliance with Benzene NESHAP
- Enhanced LDAR
- BACT for Delayed Coker

Civil Penalty -- \$8M + SEP (Fence line Monitoring)

GHG Reduction Project

Major Flare Settlements

- Shell Deer Park (July 2013)

First Olefins facility to agree to flare gas recovery.

Injunctive Relief includes:

Flare Minimization – flaring caps and flare gas recovery

Flare Efficiency – enhanced monitoring and automated steam and gas systems

Mitigation

- Wastewater Treatment plant modifications
- Tank replacements
- VOC reductions at benzene production unit

Civil Penalty -- \$2.6M + SEP (Fence line monitoring and diesel retrofits)

Major Flare Settlements

Flint Hills Resources

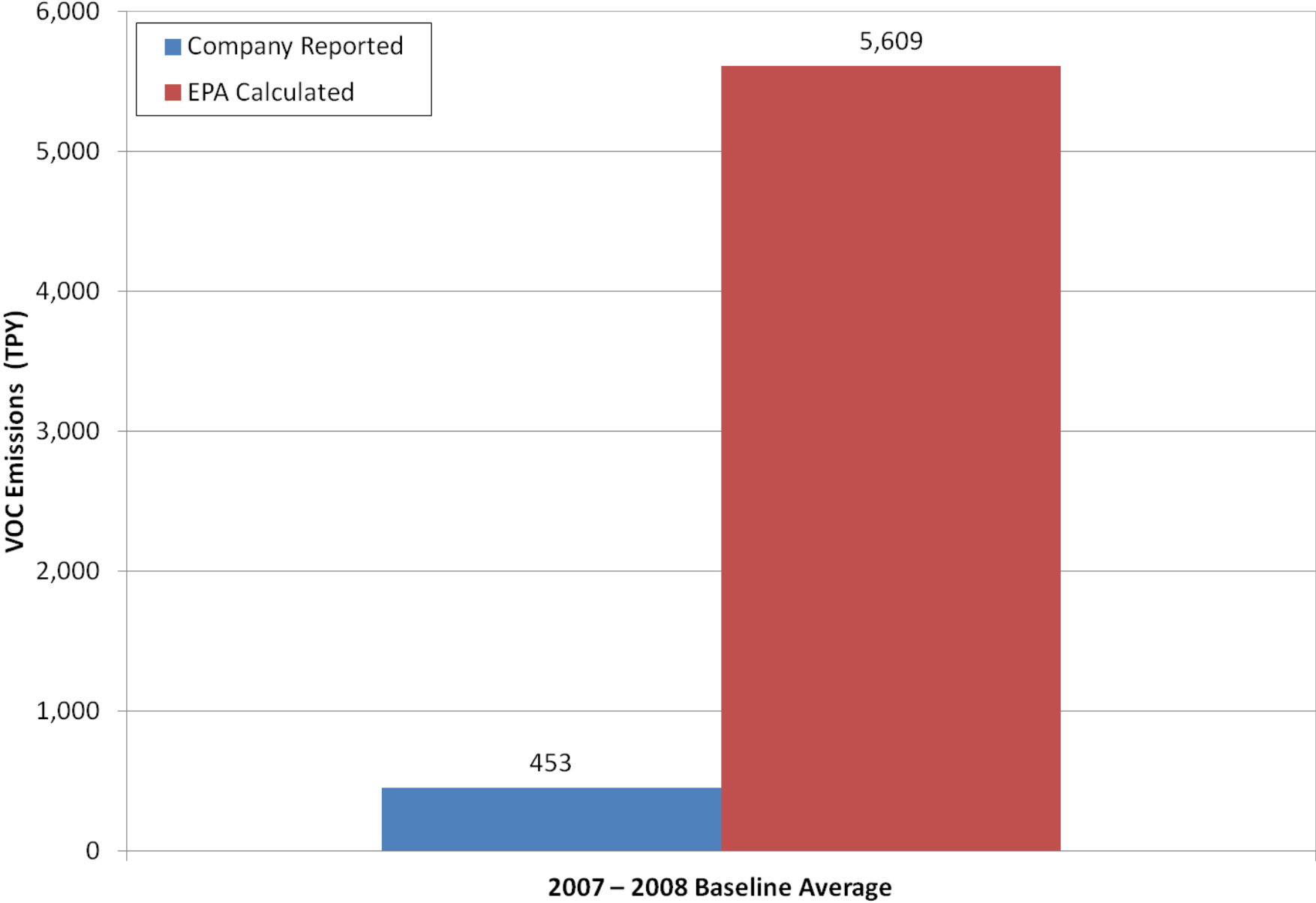
Settled March 2014

Injunctive Relief

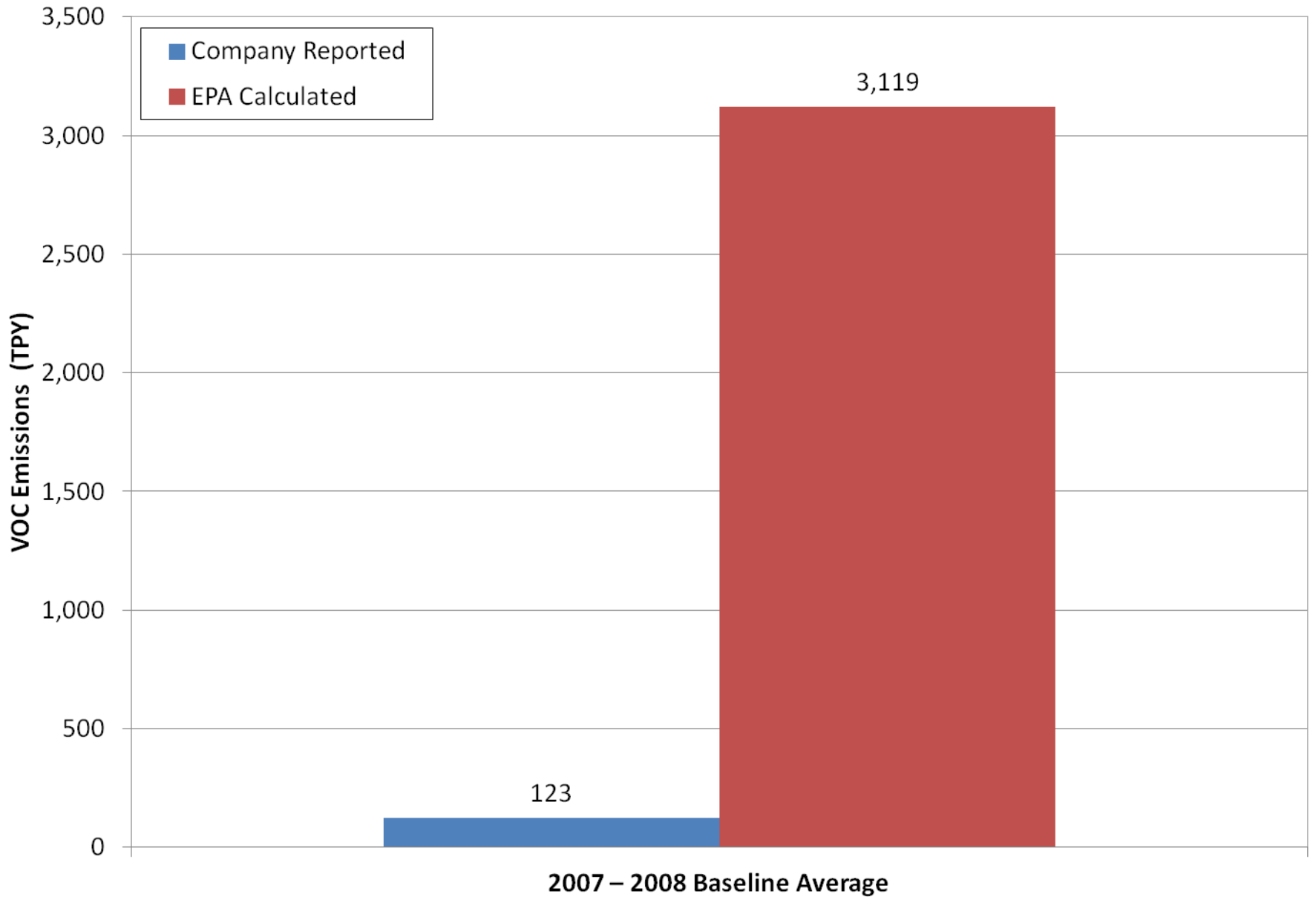
- Installation and operation of a flare gas recovery system (FGRS)
- Installation and operation of an automated flare monitoring system, including vent gas/steam flow monitoring, gas chromatograph/net heat value analyzer, and compliance with a 98% combustion efficiency requirement at each flare
- Enhanced leak detection and repair, including the installation of low-emission valve technology
- Benzene Waste Operations NESHAP compliance
- Fence Line Monitoring
- **Mitigation** (diesel retrofits and energy efficiency)
- **Civil Penalty** -- \$350K

Effect of Flaring Settlements

Marathon Petroleum Company Baseline VOC Emissions from Flares



BP Whiting Refinery Baseline VOC Emissions from Flares



General Flare Settlement Terms Going Forward

- Injunctive Relief
 - Flare Minimization
 - “Cap” on volumetric flow to the flare
 - Flare gas recovery where appropriate.
 - Flare Efficiency Measures Include:
 - Steam and vent gas flow meters
 - Real-time analysis of gas stream (BTU/Chemistry)
 - Automation of steam and supplemental gas to achieve optimal combustion efficiency at all times.
- Penalty (SEP as appropriate)
- Mitigation

Description of Refinery MACT Flare Amendments

- Proposed to amend Refinery MACT standards to include refinery-specific flare operational requirements, under CAA section 112(d)(2) and (d)(3)
- Goal of the amendments:
 - Develop requirements to ensure good combustion efficiency
 - Provide incentives to reduce overall flaring
- New monitoring and operational requirements for flare performance:
 - Flow monitoring of flare vent gas and assist medium
 - Characterization of waste gas stream
 - On-line monitoring or grab sampling options
 - Operational requirements to maintain flammability
 - Supplemental fuel may be required at some flares to ensure good combustion

Determination of Compliance Limits for Flares as Proposed in Refinery MACT

- Three parameters for achieving combustion efficiency, determined in the combustion zone (cz)
 - Net Heating Value (NHV_{CZ})
 - Lower Flammability Limit (LFL_{CZ})
 - Combustibles (C_{CZ})
- Proposed more stringent targets for streams with Olefins and H_2
- Air-assisted and non-assisted flares would comply with essentially the same metrics
 - For air-assisted flares, additional dilution factor needed to prevent excess aeration

Parameter Family	Target Vent Gas Operating Limit – No Olefin Interaction	Target Air Assist Dilution Operating Limit – No Olefin Interaction	Target Vent Gas Operating Limit – Olefin Interactions Present	Estimated Target Air Assist Dilution Operating Limit – Olefin Interactions Present
NHV_{CZ}	≥ 270	≥ 22	≥ 380	≥ 31
LFL_{CZ}	≤ 0.15	≤ 2.2	≤ 0.11	≤ 1.6
C_{CZ}	≥ 0.18	≥ 0.012	≥ 0.23	≥ 0.015

Record Keeping and Reporting

Enforcing Record keeping, Reporting, Sampling and Testing Requirements is Important

- Fuels regulations require refiners to:
 - Sample and test gasoline for benzene, sulfur, volatility and other parameters
 - Keep records of the testing, and
 - Submit periodic reports to EPA demonstrating compliance with standards
- These requirements allow EPA to efficiently and effectively monitor compliance with the fuel standards

U.S. v. Tesoro (5/13)

- Following an audit that involved extensive review of compliance records, we alleged that Tesoro failed to comply with recordkeeping requirements over several years at four of its refining facilities.
- \$1.1 million penalty
- Tesoro required implement an environmental compliance and auditing plan designed to prevent future violations and ensure compliance with EPA's fuels regulations.

Elements of the Tesoro Environmental Compliance and Auditing Plan

- Elements:
 - procedures to collect representative and homogenous samples for certification testing
 - adopt ASTM best practices for petroleum products testing laboratories;
 - participation in the ASTM Inter-laboratory Crosscheck Program
 - procedures to comply with the reporting requirements in the fuels regulations
 - procedures to ensure compliance with all recordkeeping requirements
 - staff training

- Third Party Audit:
 - Independent auditing and reporting to evaluate implementation of the compliance plan
 - Tesoro must investigate and address all areas of concern identified by the audit to bring the facility into full conformance with the plan and applicable regulations

Your Thoughts or Questions?