

Houston's Air Research:
What we know
What has worked
Why it matters

Module 4: Solutions

Bob Levy

Industry Professionals For Clean Air – Houston

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Industry Professionals for Clean Air

- Experience in petroleum and petrochemicals
- Concern for the slow pace in achieving acceptable air quality
- Believe pollution can be reduced at a reasonable cost with existing technologies
- Base our recommendations on our industry experience

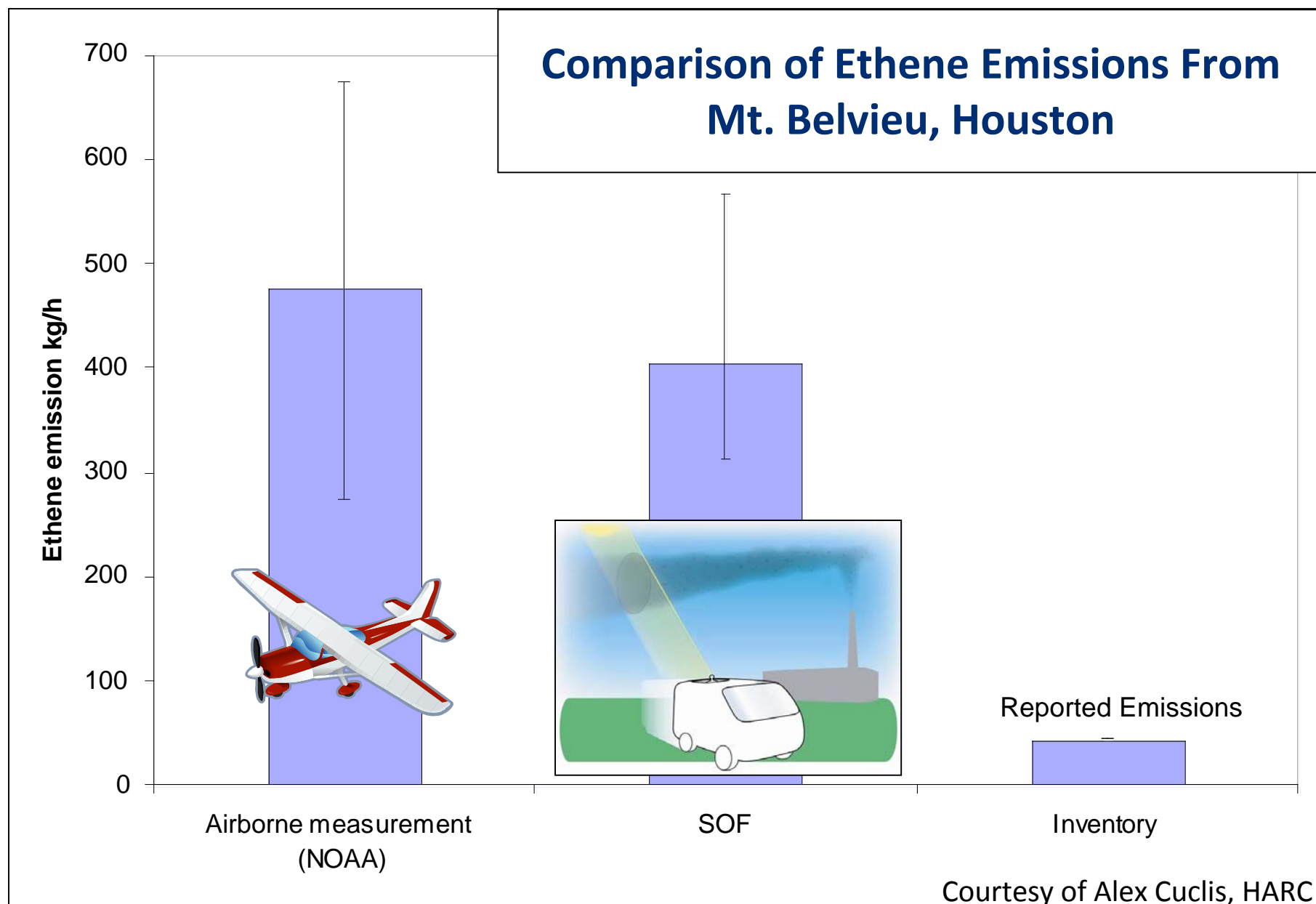
A Major Problem: Vastly Under-reported Emissions

- There is an enormous discrepancy between the predicted emissions inventory and actual measured emissions
- Extensive testing shows that industrial emissions are an order of magnitude larger than predicted

Underestimated Emissions Inventories

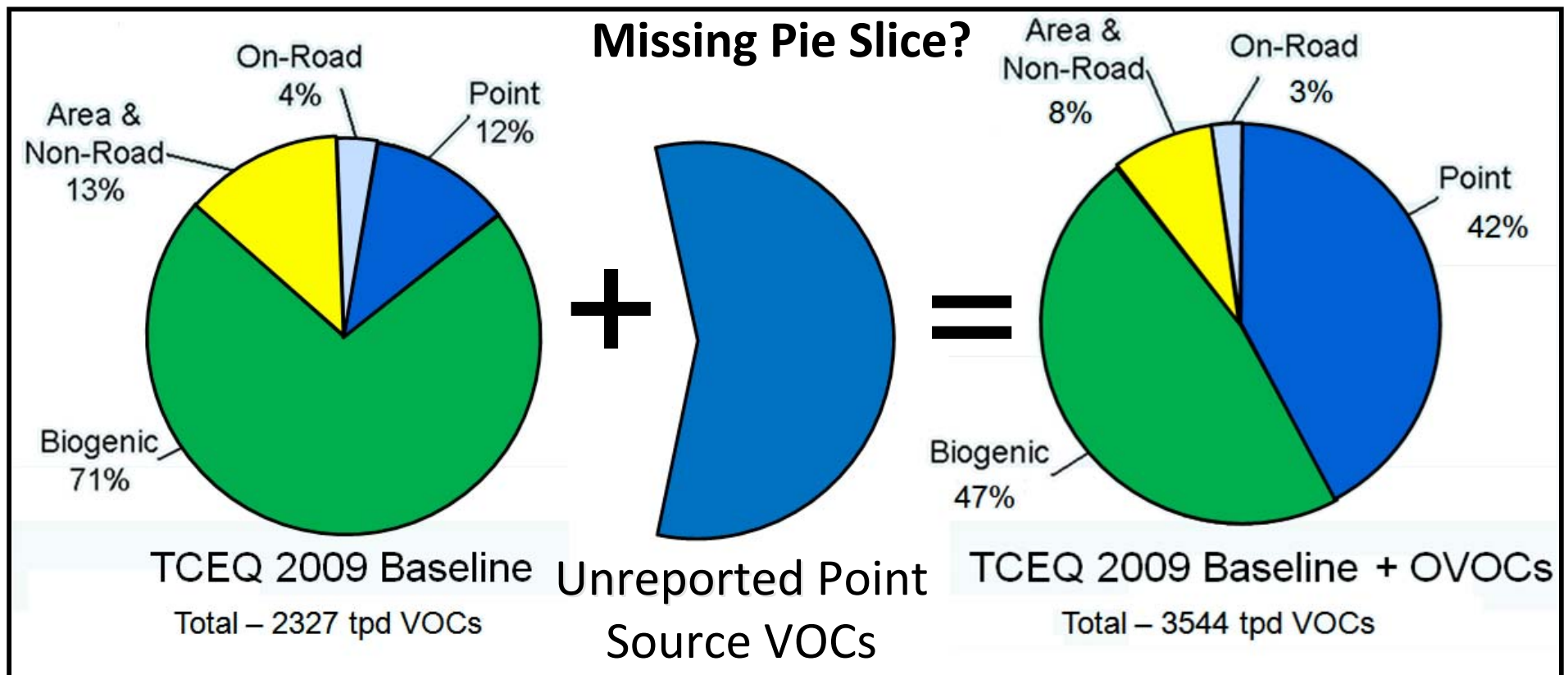
The estimating techniques used to calculate and report VOC emissions from refineries and chemical plants are off by more than an order of magnitude and have been that way for more than 20 years.

Air Quality Studies – TexAQs 2006



If Point Source VOCs Are Off by a Factor of 10 in HGB...

1. The total VOC inventory for HGB Increases By More Than 50%.
2. Point Source VOCs \approx Biogenic VOCs

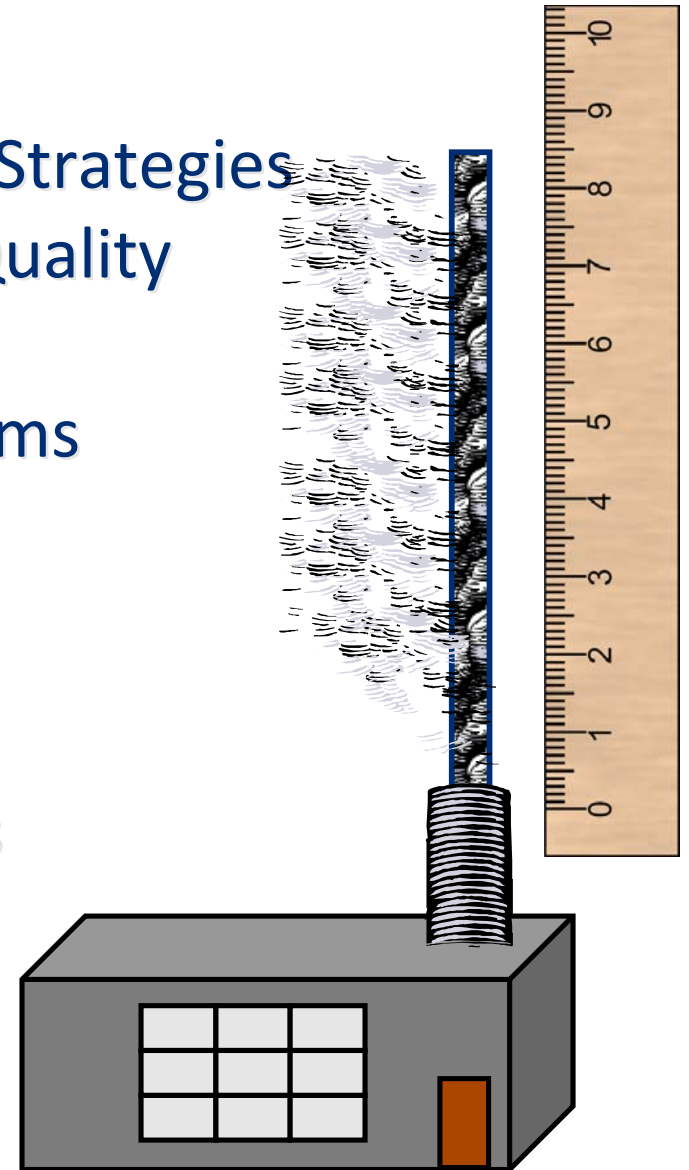


Consequences of Erroneous Predictions

1. Inappropriate Permits & Control Strategies
2. Inadequate Enforcement of Air Quality Regulations
3. Ineffective Cap and Trade Programs

In other words...

Our entire air quality control system is dysfunctional.



Underestimated Emissions Inventories

- EPA is aware of this problem
- No long-term plan exists for dealing with the discrepancies
- Meanwhile, many serious emissions problems can be addressed:
 - Use proven methods
 - Use new monitoring technologies

For Many Emissions Problems Use Proven Procedures or Technologies

- Flare emissions: Minimize flaring
 - Flare gas recovery systems
 - Improved start-up and shutdown procedures
- Fugitive emissions:
 - Leak detection and repair
 - Tank seal repair
 - Improved tank operations and maintenance
- Cooling tower emissions:
 - Cooling tower monitoring
 - Heat exchanger maintenance

Pinpointing Unknown Emissions Sources Using New Monitoring Technologies

- IR (Infrared) Camera
- SOF (Solar Occultation Flux)
- DIAL (Differential Absorption Light Detection and Ranging)

IR Camera



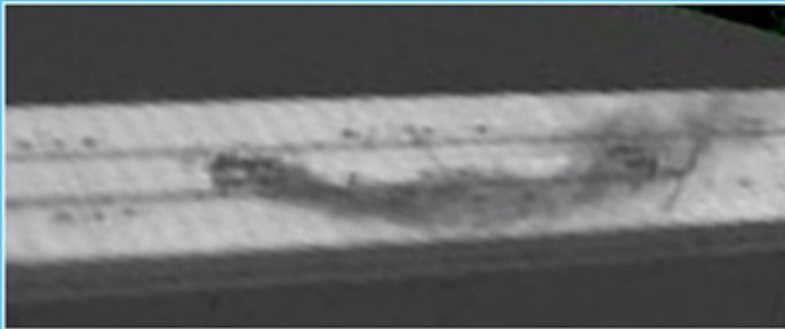
The total estimated value of annual VOC emissions (assuming \$0.40/lb) reported by the largest refineries is about **\$2 million/year.**

Some companies report that they **saved** over **\$1 million/year** by finding and fixing a single leak!

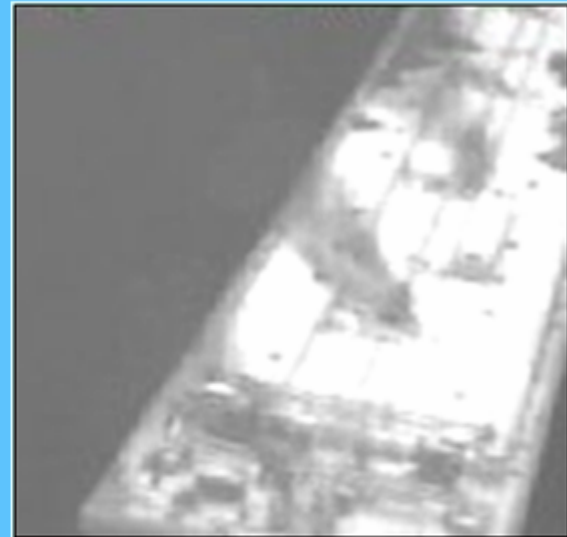
IR Camera



Barge with naked eye

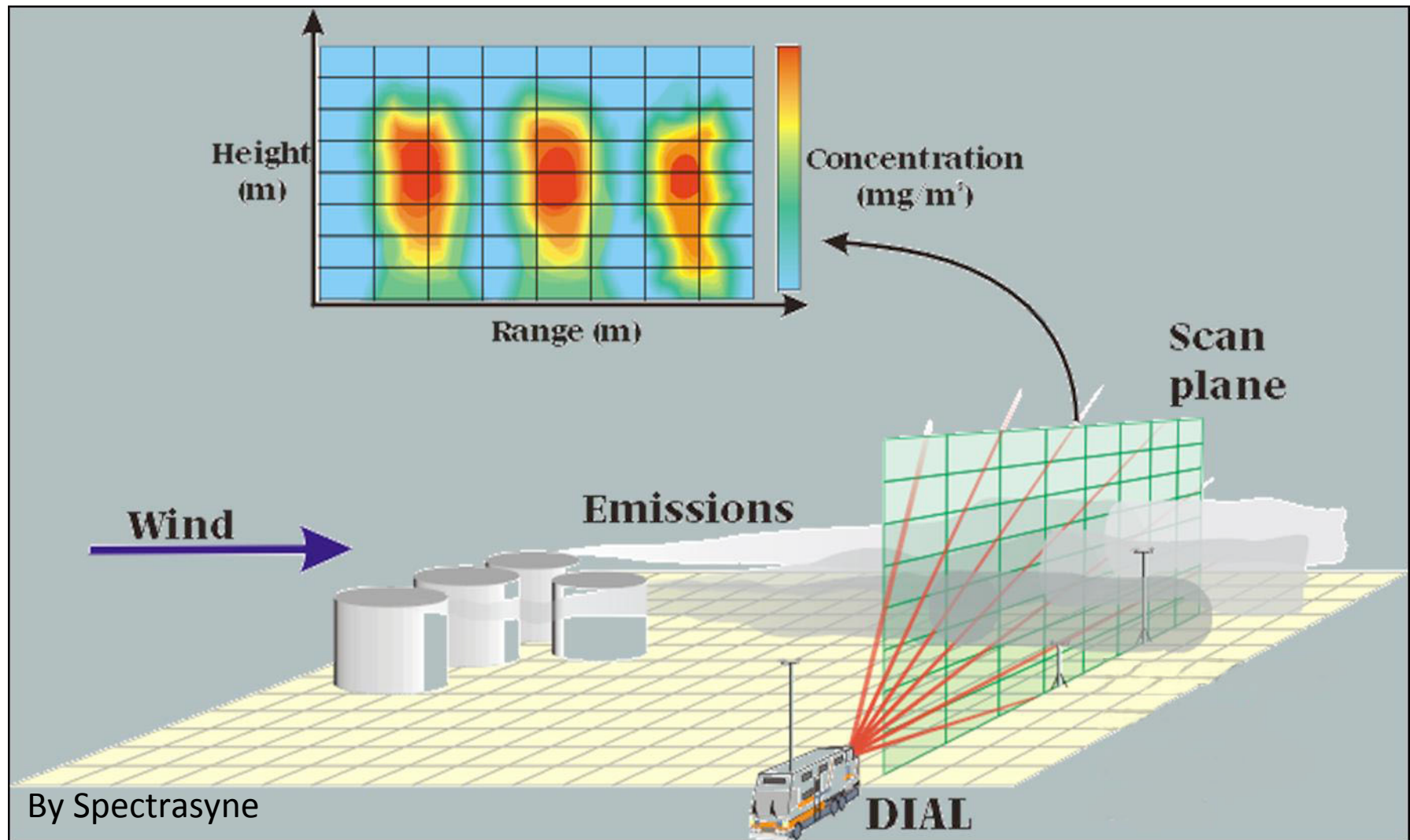


Barge with IR Camera



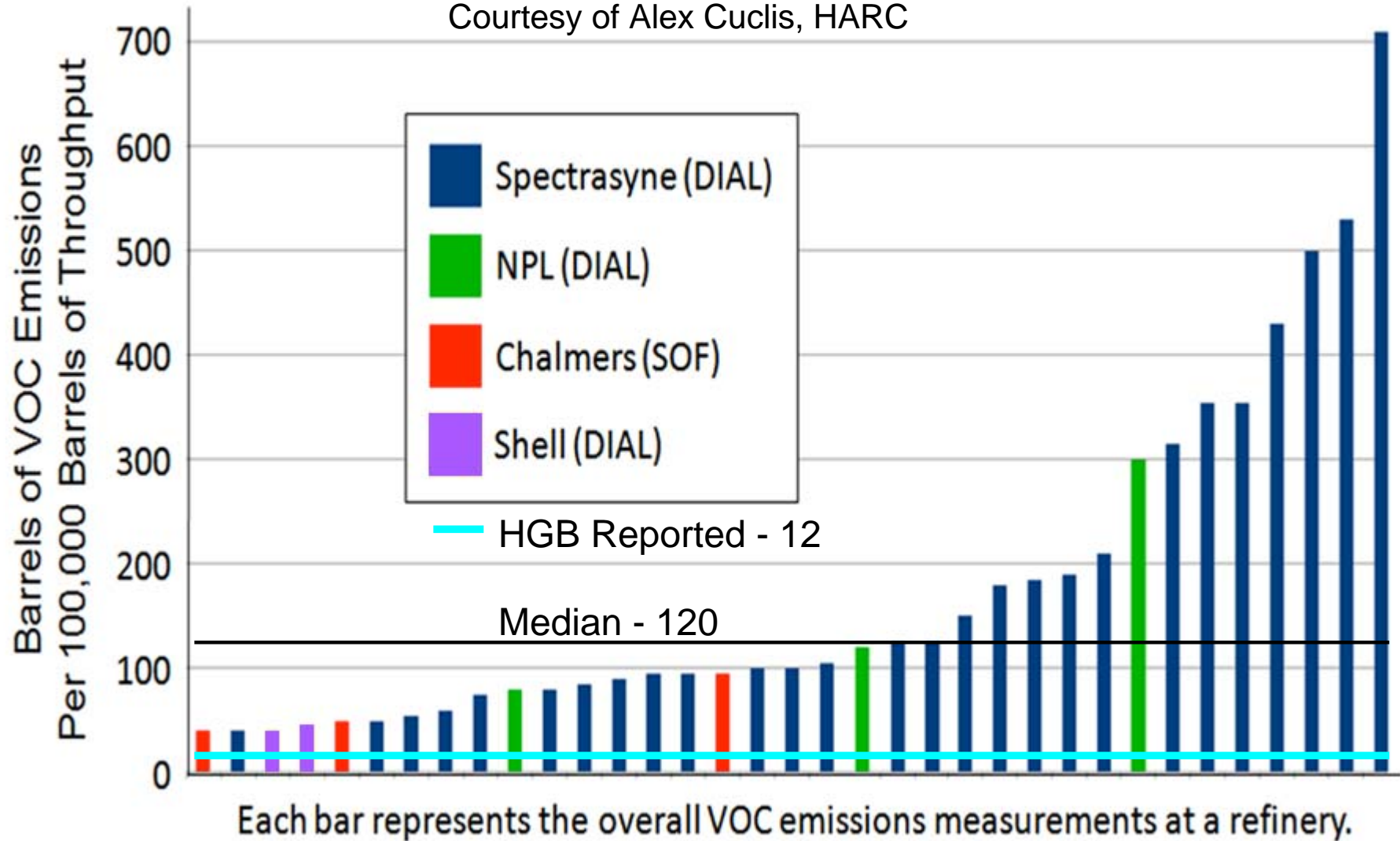
Different Barge
with IR Camera

DIAL

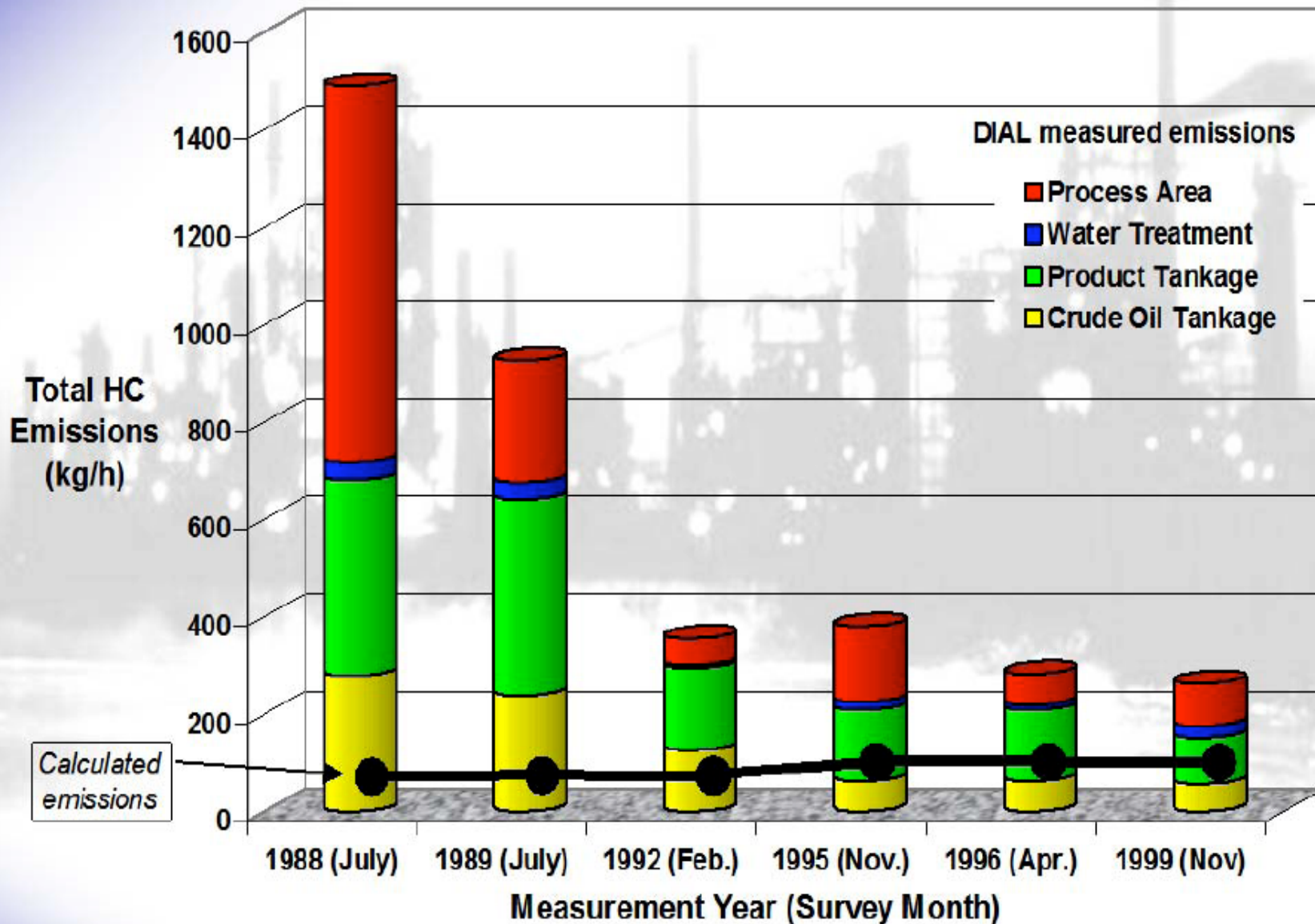


35 Refinery Measurement Surveys Since 1988

Courtesy of Alex Cuculis, HARC



Swedish Refinery Emissions



Roadmap for Reducing Industrial Toxic Emissions

- “Houston, We Have A Problem”
- Published in May 2008 by
 - Industry Professionals for Clean Air
 - Galveston-Houston Association for Smog Prevention (GHASP)
 - Environmental Defense Fund
 - Environmental Integrity Project

Federal and EPA Roadmap

- Improve monitoring and reporting – require use of new technologies
- Use cumulative impacts of emissions in regulatory determinations
- Require health impact information before release of chemicals to market
- Adopt legislation to facilitate cleanup of local toxic hotspots

State and TCEQ Roadmap

- Adopt enforceable ambient toxic standards
- Adopt legislation requiring state or local governments to clean up toxic hotspots
- Encourage local governments to protect residents from adverse health effects due to toxic air pollution

Industry Roadmap

- Make pollution reduction a priority second only to safety
- Increase facility-wide emissions monitoring using new technologies, such as DIAL
- Use current best available technologies and practices to reduce emissions
- Support reasonable regulatory proposals

Conclusions

- EPA must promptly develop and implement a plan for replacing the flawed emissions prediction tools
- Much can be done to reduce emissions using proven methods and technologies
- New monitoring technologies can pinpoint problem areas
- Existing regulations must be enforced rigorously
- All parties have a long way to go on the roadmap