Clean Air Regulatory Issues

Air Quality Team

- Lance DeLaura- SEMPRA Utilities: Southern California Gas Company, San Diego Gas and Electric Company
- Francisco Donez. US Environmental Protection Agency- National Air Quality Regulations and Trends, Impacts from National Energy Bill and Greenhouse Gas Objectives
- Wayne Barcikowski from South Coast Air Quality Management District- Local Air Quality Regulations, Outcomes of current air quality plan and future air quality plans and goals
- A.L. Wilson- Utility and consumer impacts of Air Quality, and Indoor Air Quality, Ultrafine Particles

Implications of Air Quality

- Health of humans
- Impacts to elderly, young children, those with compromised immune systems
- Ongoing comfort and safety of consumers
- Cost effectiveness of compliance for manufacturing industry and end users

Air Quality Facts

- Air quality has significantly improved since the Clean Air Act was adopted
- Much cleaner than before but we still have a long way to go to meet the ambient standards
- Clean up has been costly thus far but the control costs will escalate even more as we try to achieve the last increments

National Air Quality Regulations and Trends

Francisco Dóñez
EPA Region 9

Where does EPA get the authority to regulate air quality?

- Federal Government regulates interstate matters and states regulate within respective state boundaries
- Air pollution travels beyond state boundaries and is subject to federal regulation
- EPA is an administrative agency given authority to pass rules by congress

Clean Air Act, Title I – NAAQS Program

EPA sets National Ambient Air Quality Standards for six common pollutants:

- particulate matter (PM10-PM2.5)
- ozone (O_3)
- sulfur dioxide (SO_2)
- carbon monoxide (CO)
- lead (Pb)
- nitrogen dioxide (NO_2)

Energy Independence and Security Act (EISA)

- New CAFE Standards
- Renewable Fuels
- Lighting and Appliance Efficiency
- New technologies and tax incentives.

GHG - Advance Notice of Proposed Rulemaking

- USEPA obligated to respond to the Supreme Court's decision in *Massachusetts v. EPA*.
- Energy Independence and Security Act (EISA) changed the policy, but not the legal or scientific, context for that response.
- Need to consider what additional CAA regulation would or could follow from CAA vehicle standards.

EPA Mandatory GHG Reporting Rulemaking

- Objective(s) of the Program – to provide data that will inform and support development of national climate policy

- Scope of Coverage
  - Define gases- "…to require mandatory reporting of greenhouse gas emissions"
    - CO_2, CH_4, N_2O, HFC, PFC, SF_6
  - Both upstream and downstream sources- "The Agency is further directed to include in its rule reporting of emissions resulting from upstream production and downstream sources…"
    - Upstream: Fuel and Chemical producers/importers (e.g., oil refineries, natural gas processors, HFC producers)
    - Downstream: GHG emitters (e.g., power plans, iron and steel plants, cement manufacturers

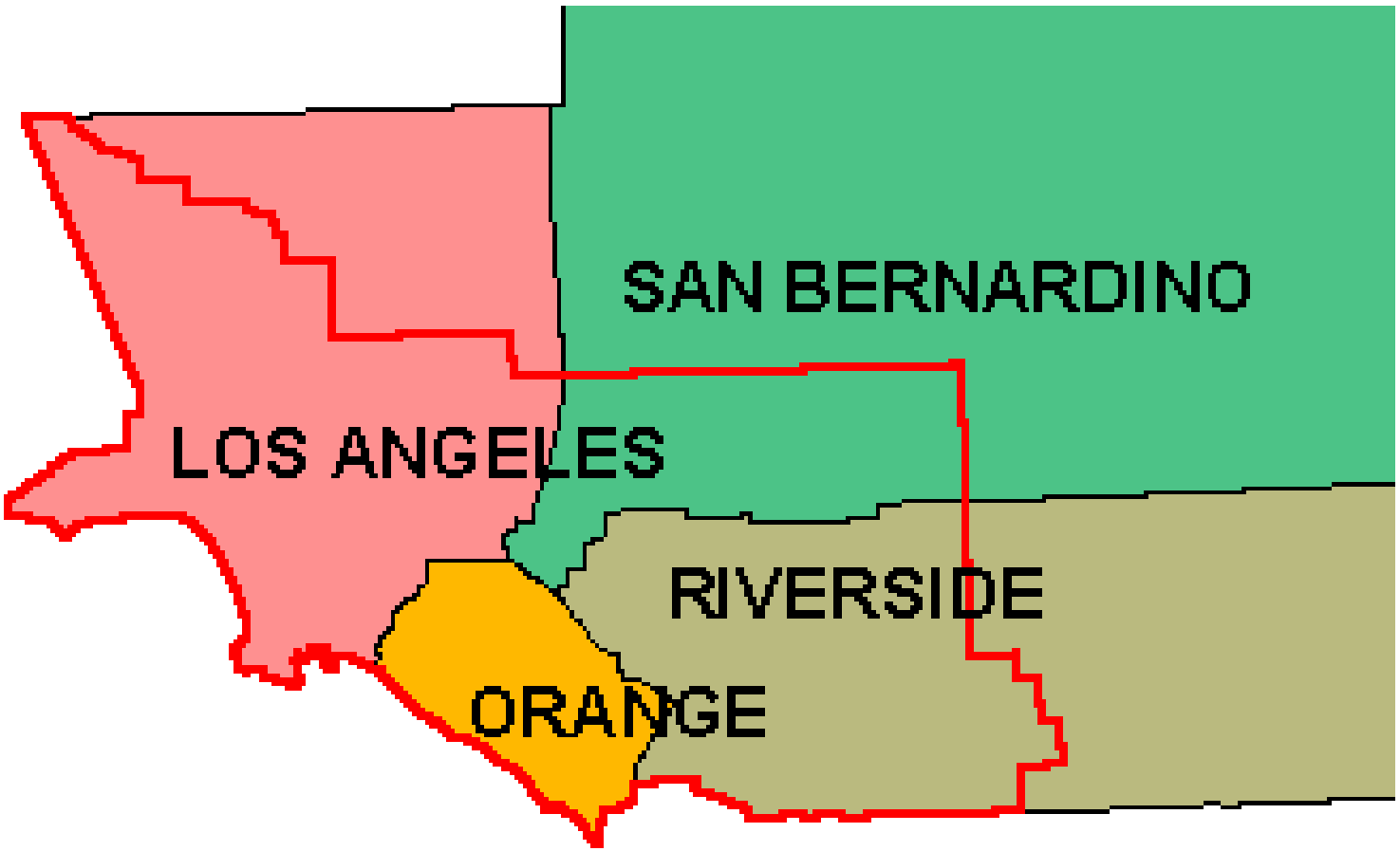
Current SCAQMD Air Quality Management Plan and Future Rule Amendments

ACEEE Forum on
Water Heating and Use

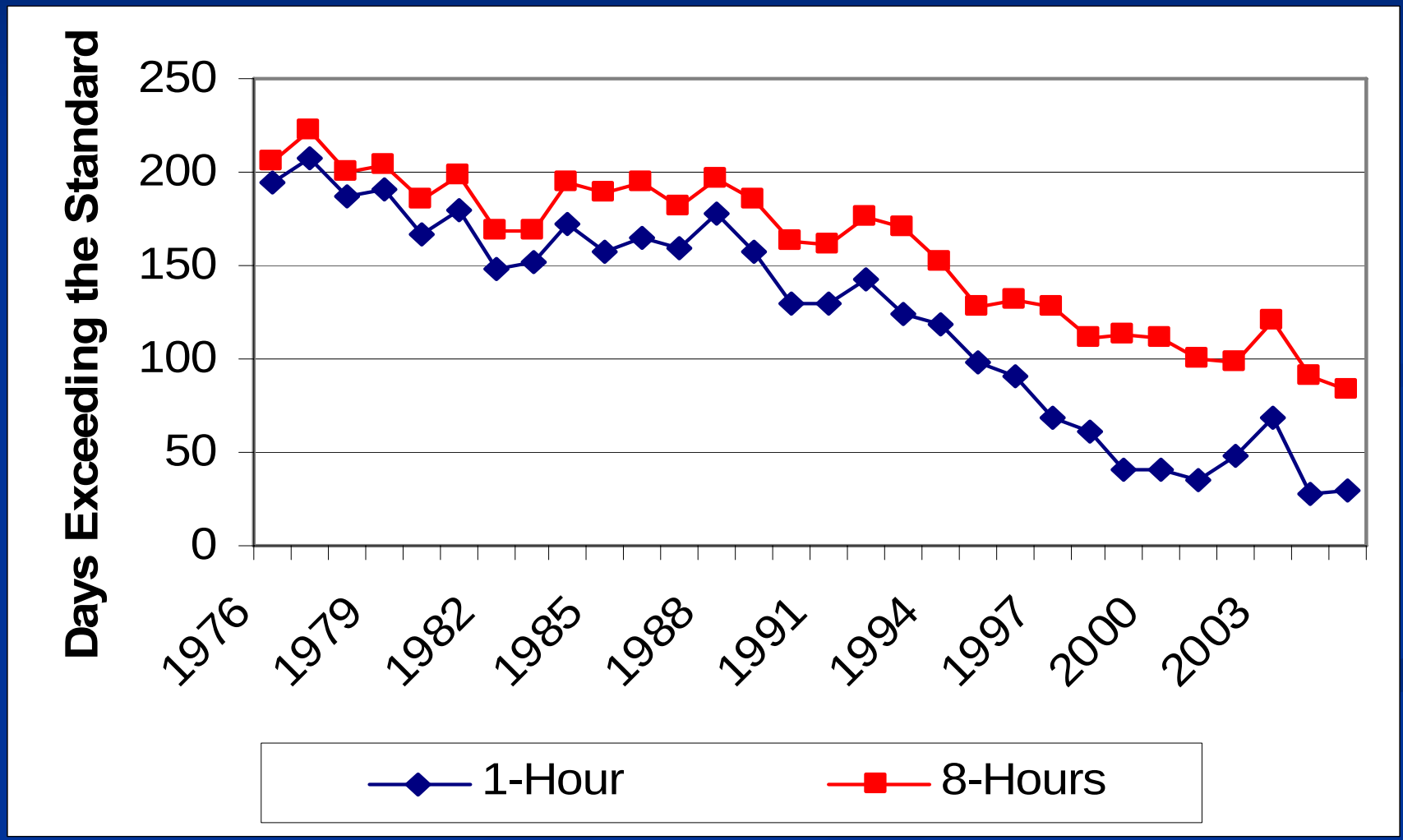
Wayne Barcikowski, SCAQMD

June 3, 2008

South Coast Air Basin

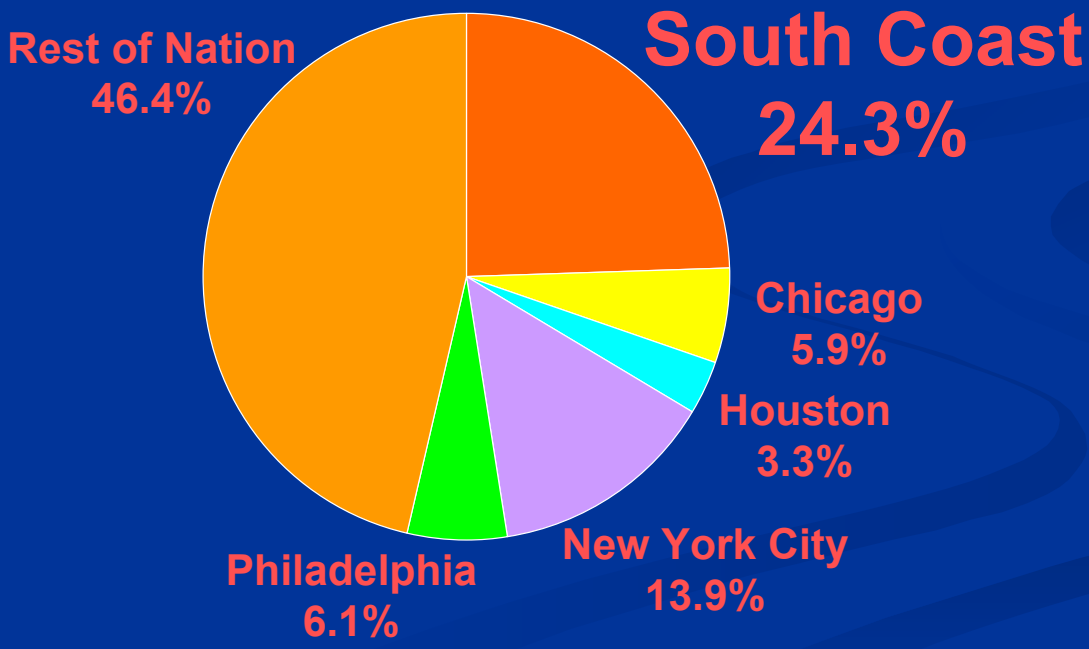


Air Quality Trend
Days Exceeding Ozone Standards



SCAB's Disproportionate Air Pollution Exposure

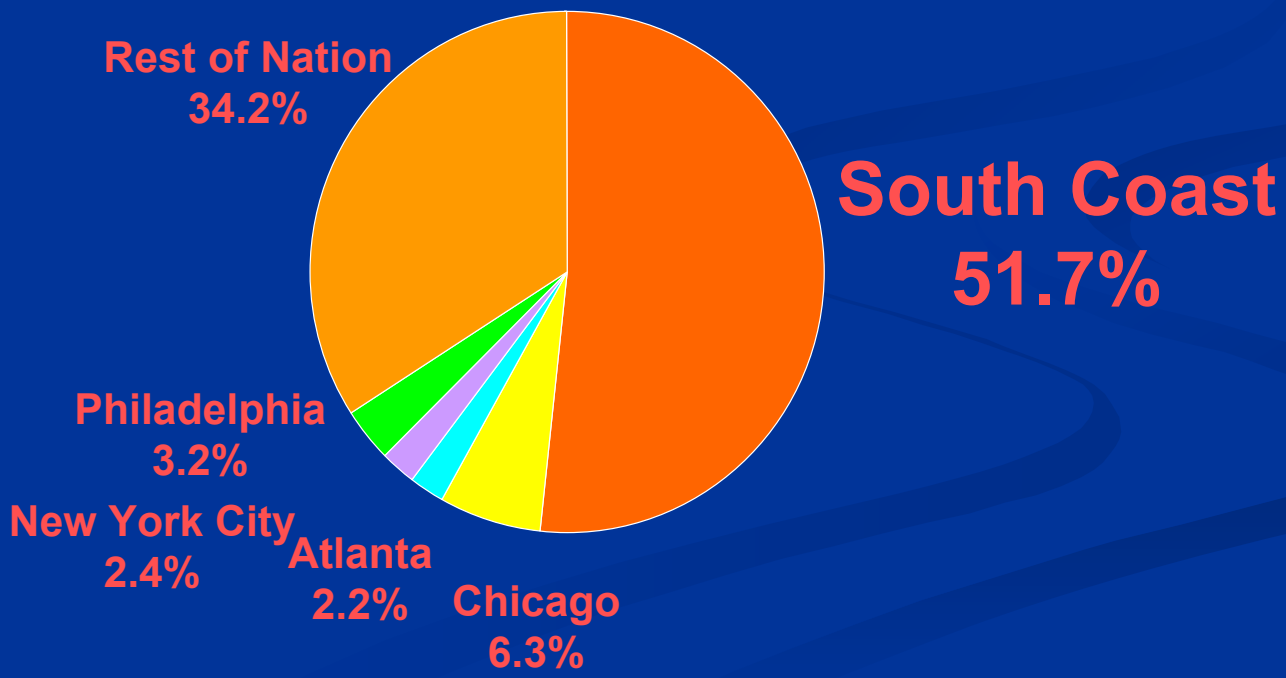
8 Hour Ozone
(NAAQS = 0.08 ppm)



Population-weighted exposures above the NAAQS, based on 2000-02 AIRS data

SCAB's Disproportionate Air Pollution Exposure (cont.)

Annual Average PM2.5
(NAAQS = 15 ug/m^3)



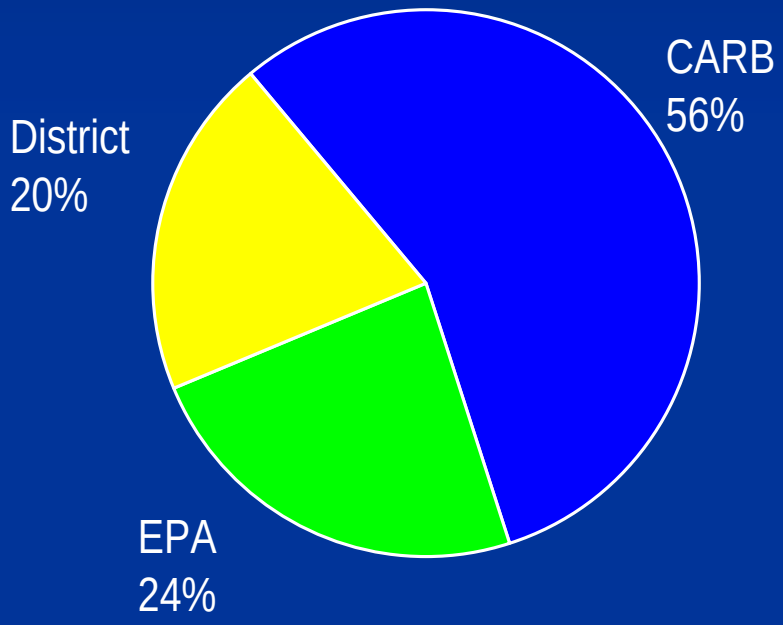
Population-weighted exposures above the NAAQS, based on 2000-02 AIRS data

Air Quality Management Plan

- Regional Blueprint to Meet Air Quality Standards
- Integrated Plan to Address Both PM2.5 and 8-hour Ozone Standards
  - PM2.5: 2015
  - 8-Hour ozone: 2024
  - NOx is a key precursor for both pollutants
- Significant Emissions Reductions Needed to Attain Both Standards
- CCAA -- All feasible measures

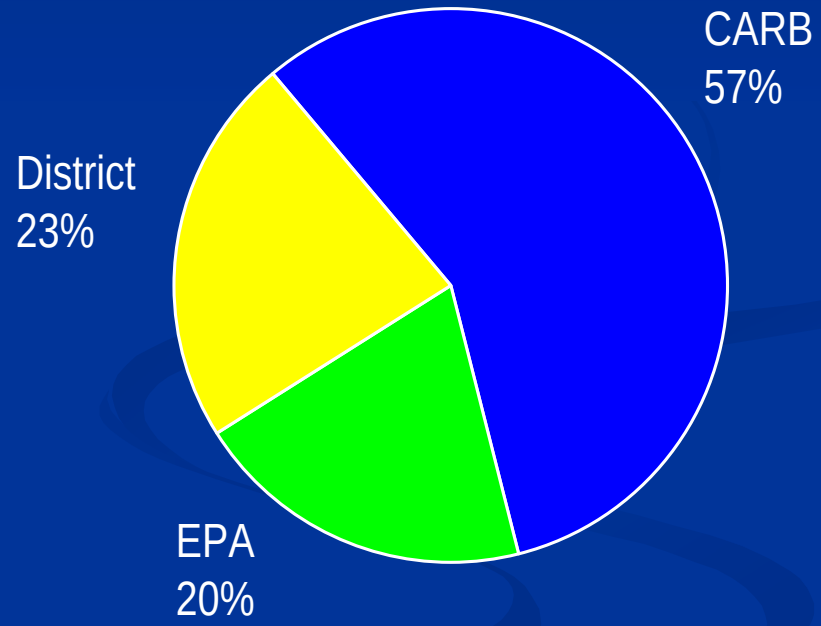
Primary Emissions Responsibility by Agency

PM2.5, 2014



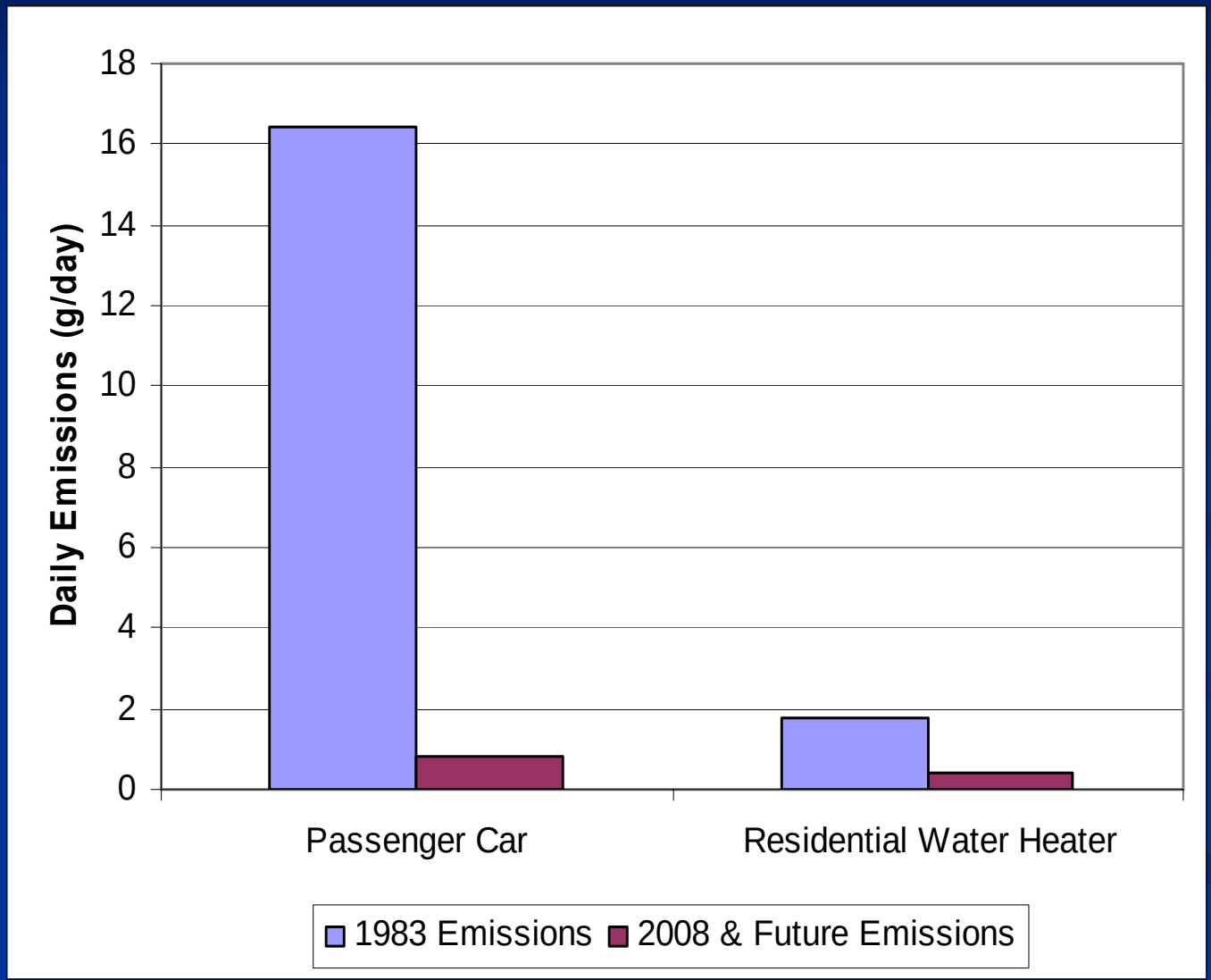
(NOx, SOx, PM2.5)

8-Hr Ozone, 2023



(VOC, NOx)

NOx Emission Trends



SCAQMD Regulation of Boilers and Water Heaters

- RECLAIM – Cap and Trade Program for Large Facilities (4 tons/year)
- Rule 1121 – Residential Tank Type Water Heaters Rated Less Than 75,000 Btu/hr
- Rules 1146, 1146.1 and 1146.2 – Boilers, Process Heaters and Water Heaters Excluding RECLAIM and Rule 1121 units

Chronology of Rule 1121 - Residential Tank Type Water Heaters < 75k Btu

- Rule adopted December 1978 with 40 ng/J limit
- Rule amended December 1999 to lower NOx limit in two steps from 40 ng/J:
  - to 30 ppm or 20 ng/J by July, 2002 (or mitigation fee)
  - to 15 ppm or 10 ng/J by January, 2005
- Rule amended in September 2004 to extend compliance dates to January 2006 – 2008
- December 2005 - manufacturers granted 21 month product variance from Hearing Board

Chronology of Rule 1146
(≥5 mm Btu/hr)

Key Components / Changes

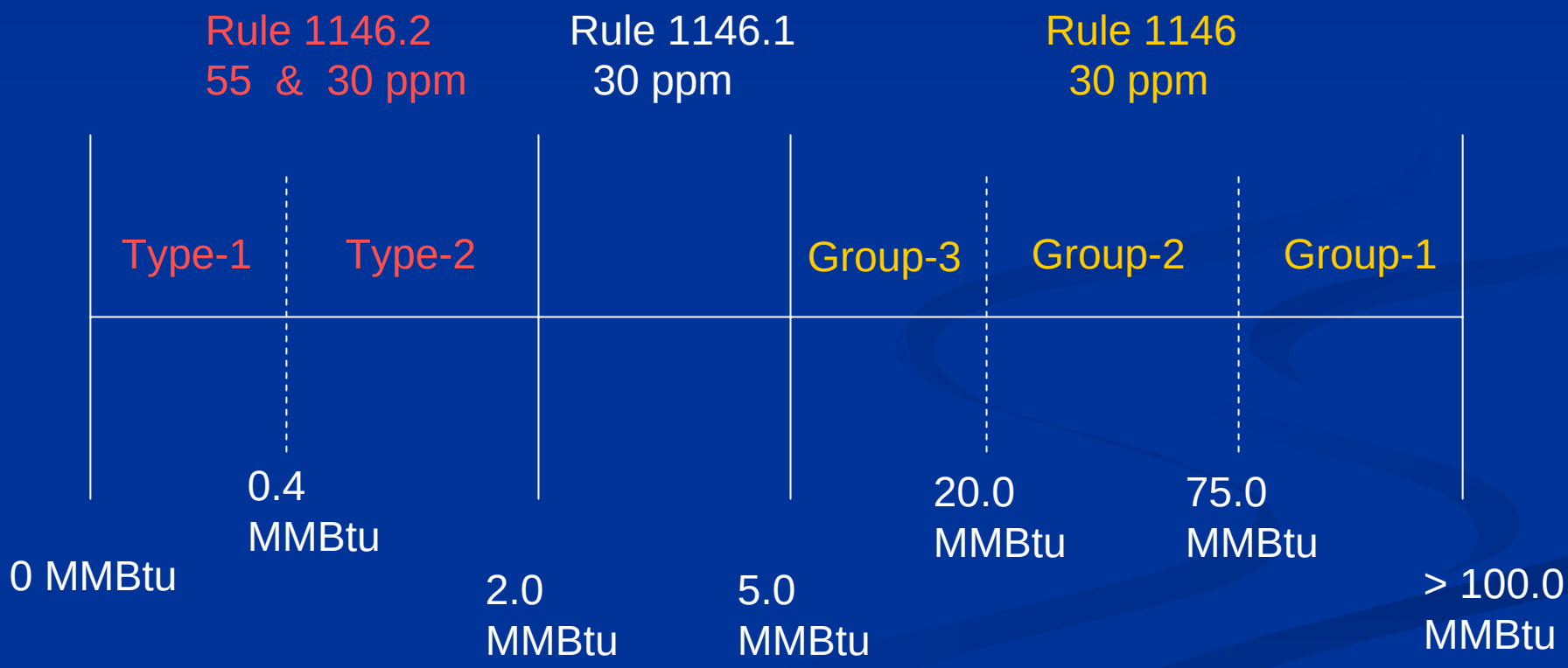
- Adopted in 1988 --> 40 ppm NOx
- Amended in 1989 --> 30 ppm NOx for larger units
- Amended in 1994 --> Revised tune-up provisions for exempt units
- Amended in 2000 --> 30 ppm NOx

Chronology of Rule 1146.1
(>2 and <5 mm Btu/hr)

Key Components / Changes

- Adopted in 1990 --> 30 ppm NOx
- Amended in 1992 --> Correct SIP deficiencies (e.g., Source Test Method)
- Amended in 1994 --> Add a tune up procedure for natural-draft units

Heater/Boiler Rule Categories



Commitments For Reductions from Water Heaters and Boilers

- 1988 AQMP – Industrial & institutional boilers and process heaters
- 1991 AQMP – RECLAIM splits off boilers from power generation and refineries
- 1997 AQMP – Control measure for small boilers and water heaters (Rules 1121 and 1146.2)
- 1998-1999 – Adopted 1146.2 & Amended 1121
- 2006 – Revised Rule 1146.2 limit to 20 ppm
- 2007 AQMP – Facility modernization to meet BACT and all feasible measures

2007 Air Quality Management Plan Control Measure

- Facility Modernization - Control Measure MCS-01

  As equipment reaches the end of its useful life, it is either upgraded or replaced to meet emission limits that are consistent with Best Available Control Technology (BACT)

Future Heater/Boiler Limits

For Questions or Comments on Proposed Amendments, Contact:

Rule Development

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California Environmental Quality Act (CEQA) Analysis

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Impact of Air Quality Regulations

A.L. Wilson
Wilson Environmental Associates
Irvine, CA
June 2008

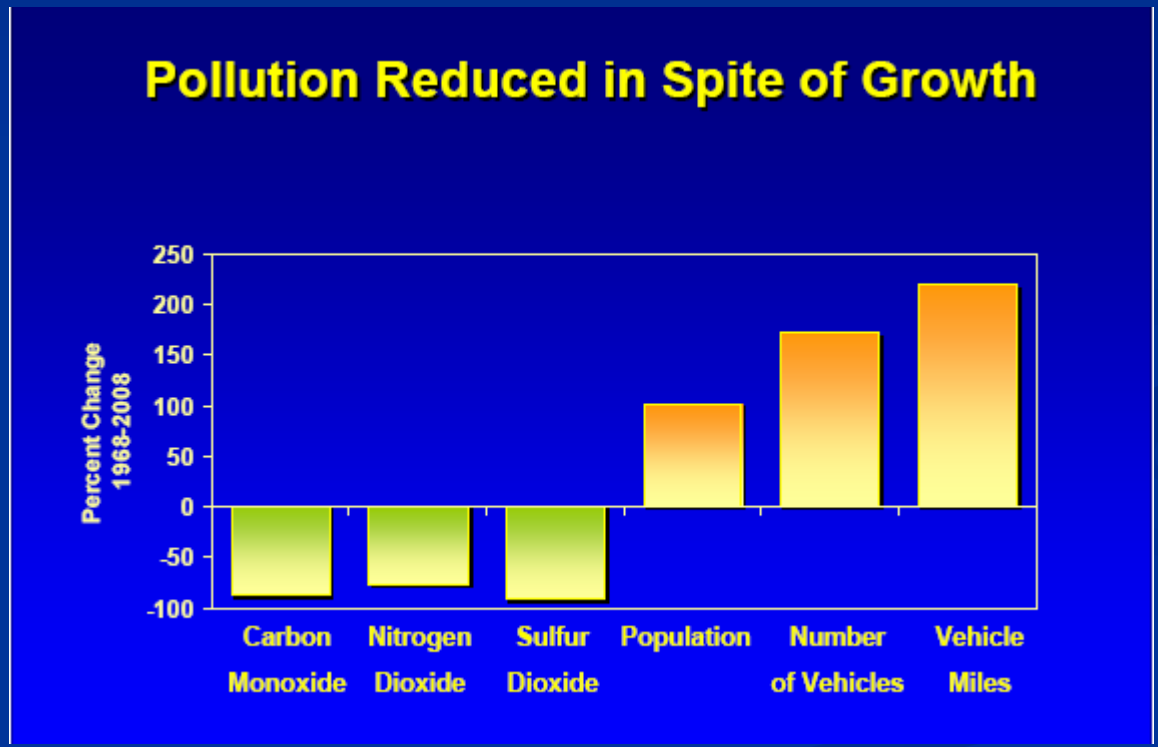
Outline

- Impact of AQ Regulations
- WH Control Costs
- Emerging AQ Issues
- Indoor AQ

Impact of AQ Regulations

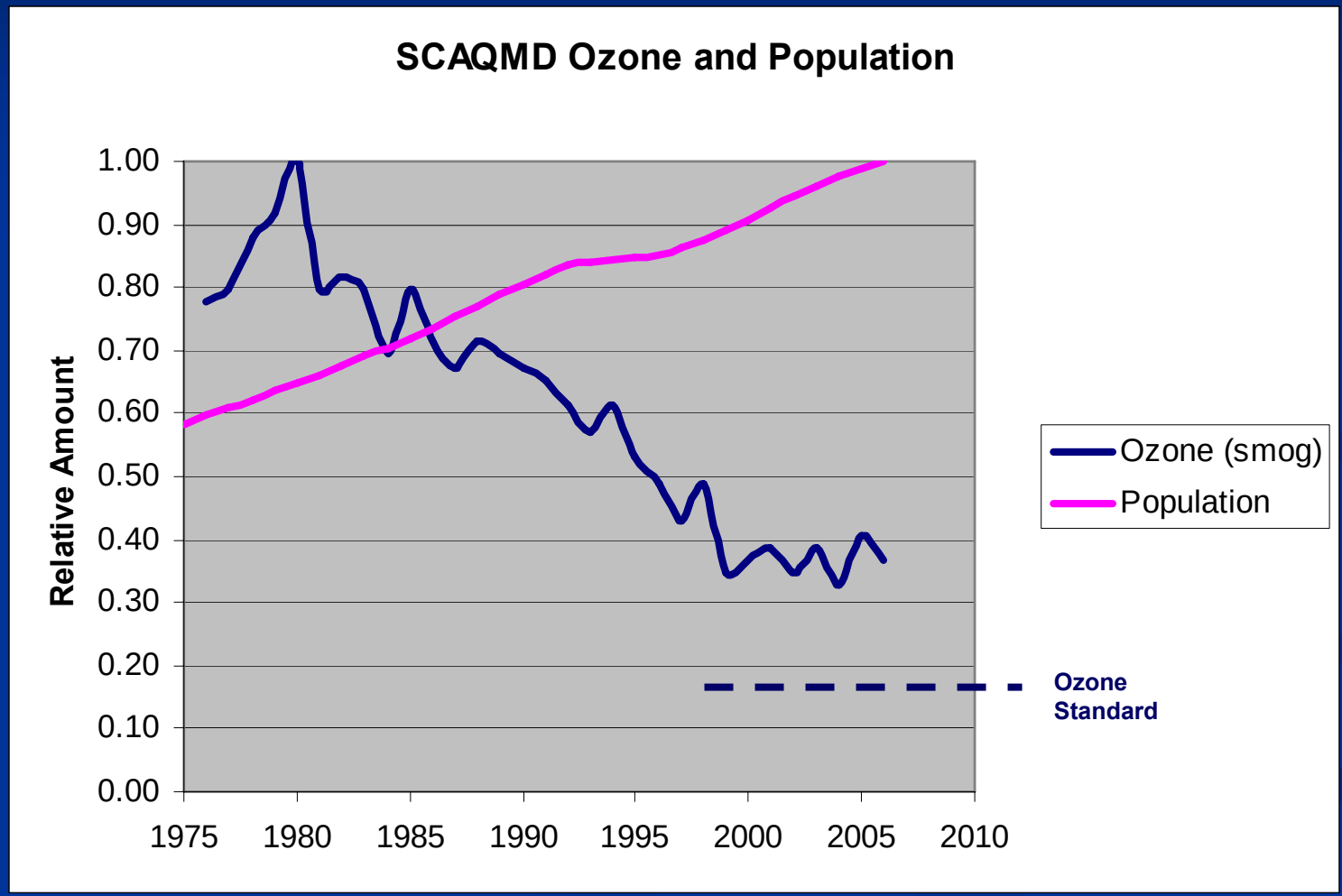
- Air pollution has been reduced significantly
- Still not as clean as required
- Future improvements will probably cost much more per pound removed and require life style changes

California 1968 to 2008

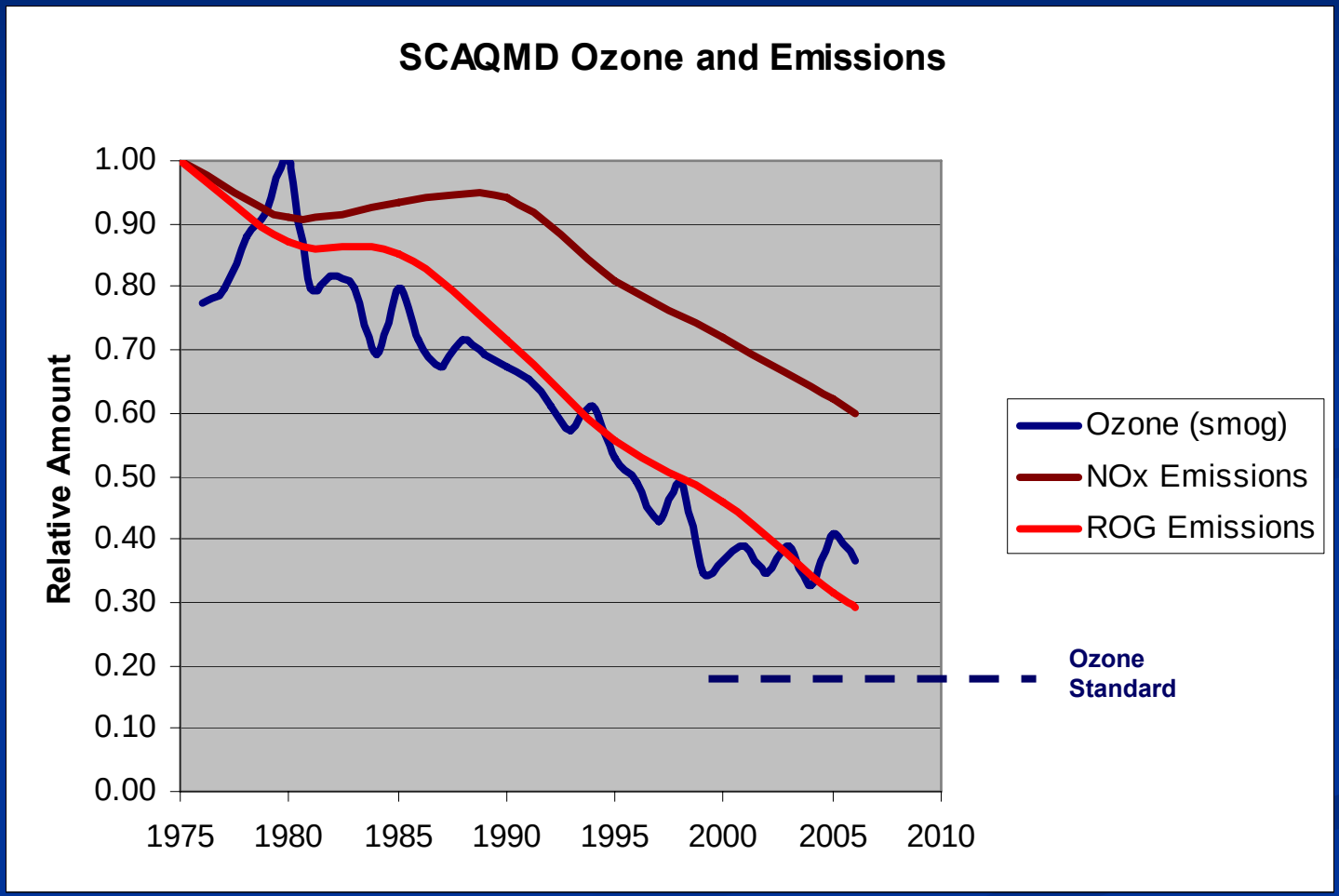


From CARB

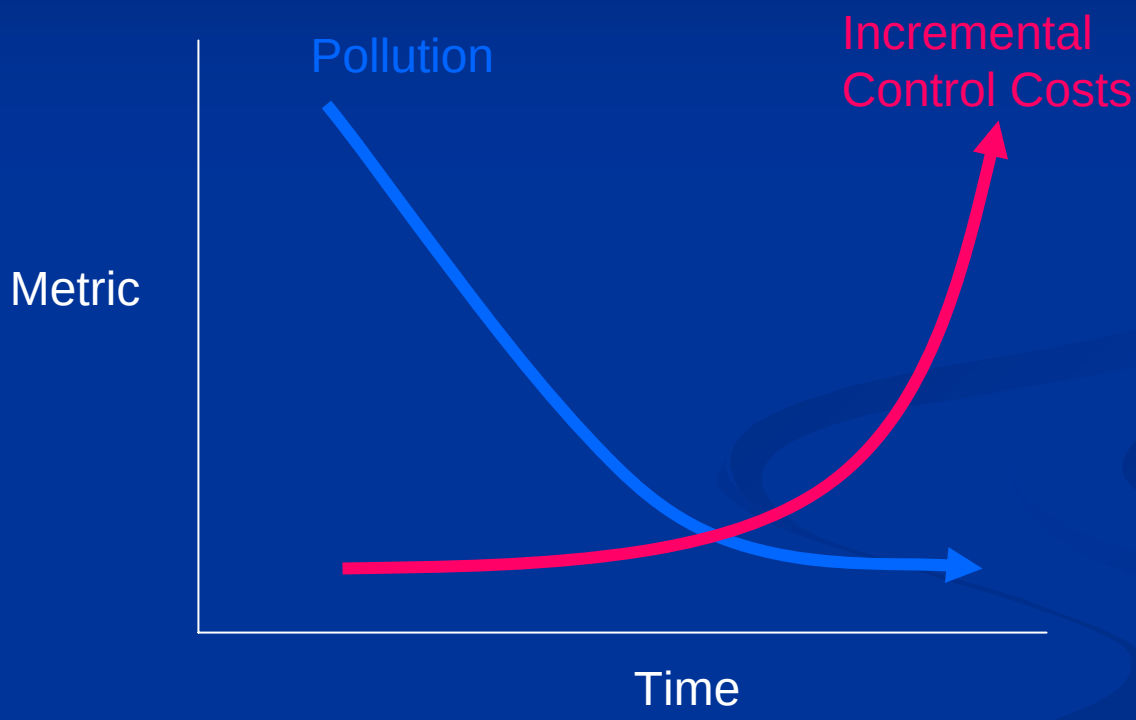
Air Quality Improved Despite Population Growth



Emissions Must Be Reduced



Future Emission Reductions May Be Very Costly



Water Heater Control Costs

- General discussion of AQ Regulation Costs
- Added WH costs impacts low income homes
- One more straw on camel's back?

Air Quality Cost Impacts

- Cost of Emission Controls or Life Style Changes
  - Capital Investment
  - Operating Expenses
  - General Inflation
- Cost of Not Controlling Emissions
  - Increased health care expenses
  - Premature deaths
  - Missed work or school
  - Lower property values

No Agreement on AQ Costs

- Very few non-biased studies on the aggregate costs and benefits of air quality regulations
- In 1988 SCAQMD estimated benefits of $11 billion and costs of $2 billion but another independent investigation estimated costs to be $25 billion
- Auto industry study estimated control costs to be 7 to 11 times higher than CARB estimates
- CARB asserts that benefit costs out weigh control costs by 4 times

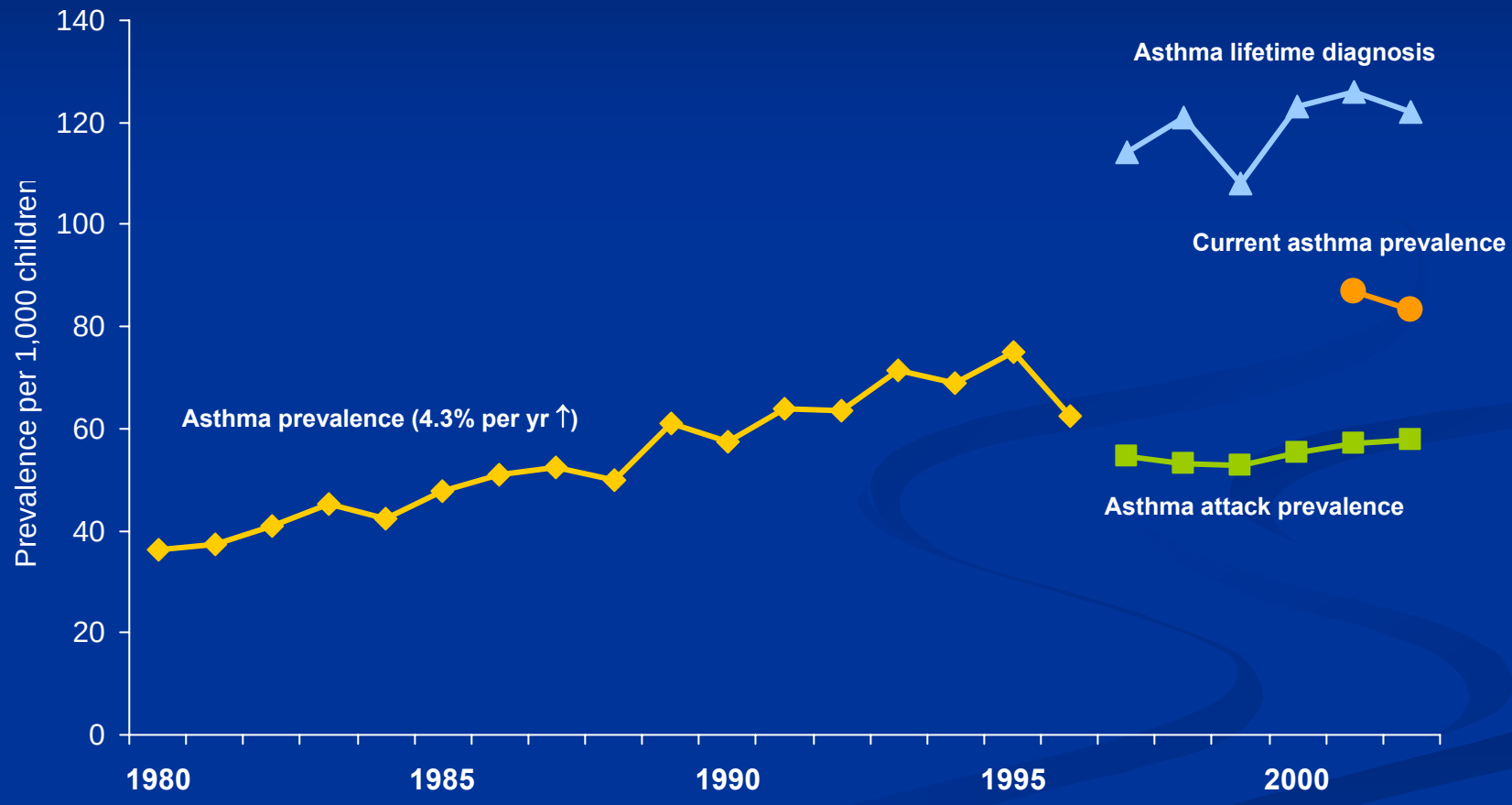
Water Heater Control Costs

- WH costs will increase
  - $400 current cost
  - $500 expected cost
  - Up to 25% increase in cost
- As with most pollution control costs, it will impact low income homes more
- Typical air pollution controls on cars adds about 5 to 10% to the cost of the car
- Lower income families impacted more

Emerging AQ Issues

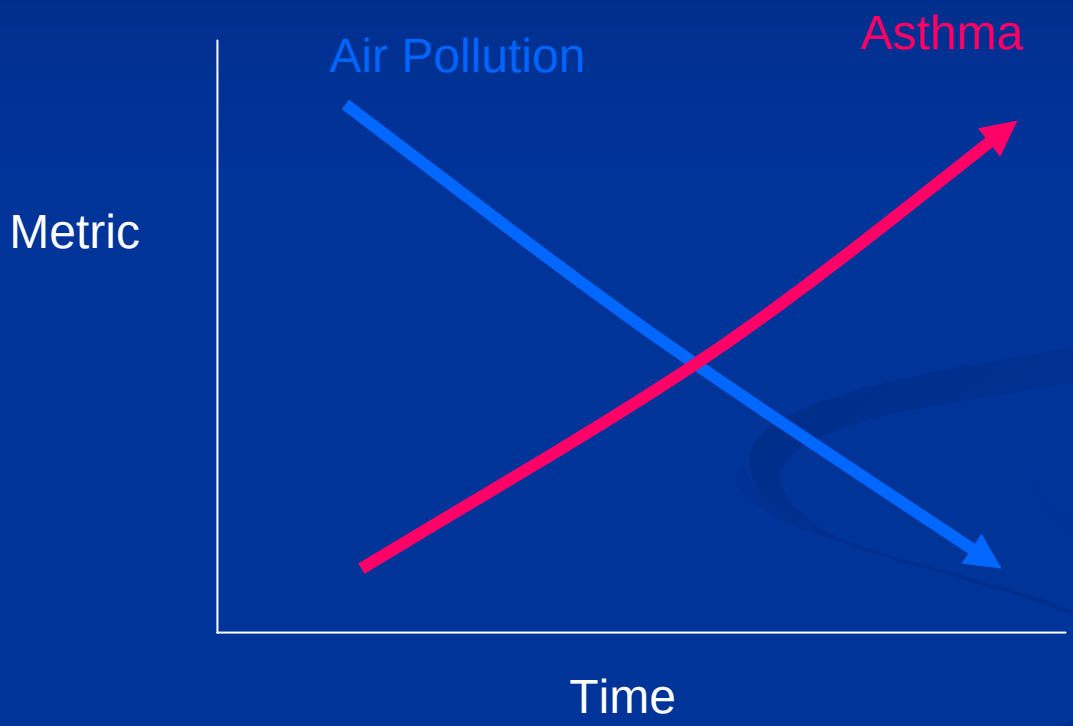
- Asthma increasing even though AQ is improving
  - Are we not measuring the right compounds or is asthma not caused by air pollution?
- Ultrafine particles
- Indoor Air Quality

Asthma prevalence, 1980-96, asthma lifetime diagnosis, current and asthma attack prevalence, 1997-2002: NHIS, children 0-17 years



From Lukacs, CDC

Asthma Not Improving as Air Pollution Decreases



Ultrafine Particles

- Very small, less than 100 nm, about the size of a virus, liquid and solid
- Moves into blood stream from lungs
- Formed by chemical reactions (combustion) not from mechanical processes
- Number of particles and surface area more important than mass
- No correlation with PM2.5 or PM10
- Natural gas combustion produces about the same number as coal or fuel oil combustion
- Electrical appliances are an indoor source

Indoor AQ

- New homes being built much tighter, not enough fresh air
- Impact of indoor sources will be increased with less outdoor air
- Impact of outdoor sources will be decreased with less outdoor air

Q&A

Questions for all presenters