

BAY AREA AIR QUALITY MANAGEMENT DISTRICT



Community Meetings

October, 2008

Presentation Overview

- BAAQMD: 9-county area
 - 22 member governing board
- Purpose of Plan
- Air quality status and trends
- Air pollutant overview
- Break for Q & A
- Scope of Plan
- Plan schedule & process
- Public Outreach
- Q & A



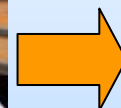
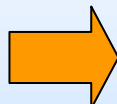
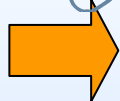


Purpose of 2009 Clean Air Plan

- **Improve air quality**
- **Protect public health**
- **Protect our climate**
- Update 2005 Ozone Strategy
- Continue progress toward attaining standards
- Develop integrated plan to address multiple pollutants
- Coordinate w regional land use & transp plans

From Emission to Health Effects

Meteorology



Emissions

Concentrations

Exposure

**Health
Effects**



Air Quality Status & Trends

Great progress in improving air quality, despite growth in population (2x) & driving (3x)

- Attained standards for CO, SO₂, NO₂, lead
- Reduced frequency & severity of ozone & particulate matter (PM) exceedances
- New, more stringent ozone & PM standards
- Major reduction in air toxics & cancer risk
- Reducing public exposure is a key priority:
 - CARE program & Grant programs

1950's



Ozone Basics

Ozone (smog) is formed via photochemical process

Ozone levels are highest on hot days

Ozone affects health

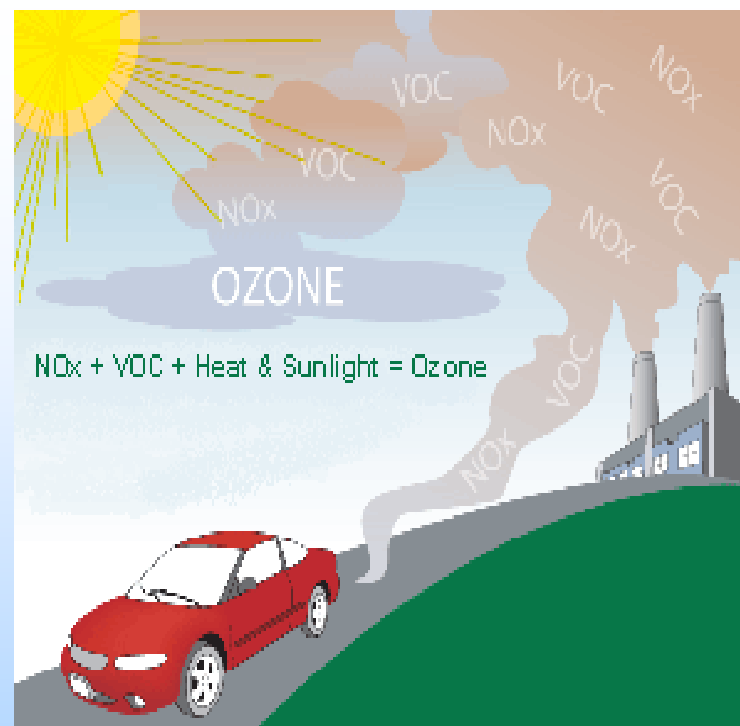
- Irritates respiratory system/shortness of breath
- Aggravates asthma, bronchitis, emphysema
- Long-term exposure damages lung tissue
- Children, seniors are most at risk

Ozone affects the environment

- Damages crops, plants, ecosystems, buildings

Sources of VOC and NO_x emissions:

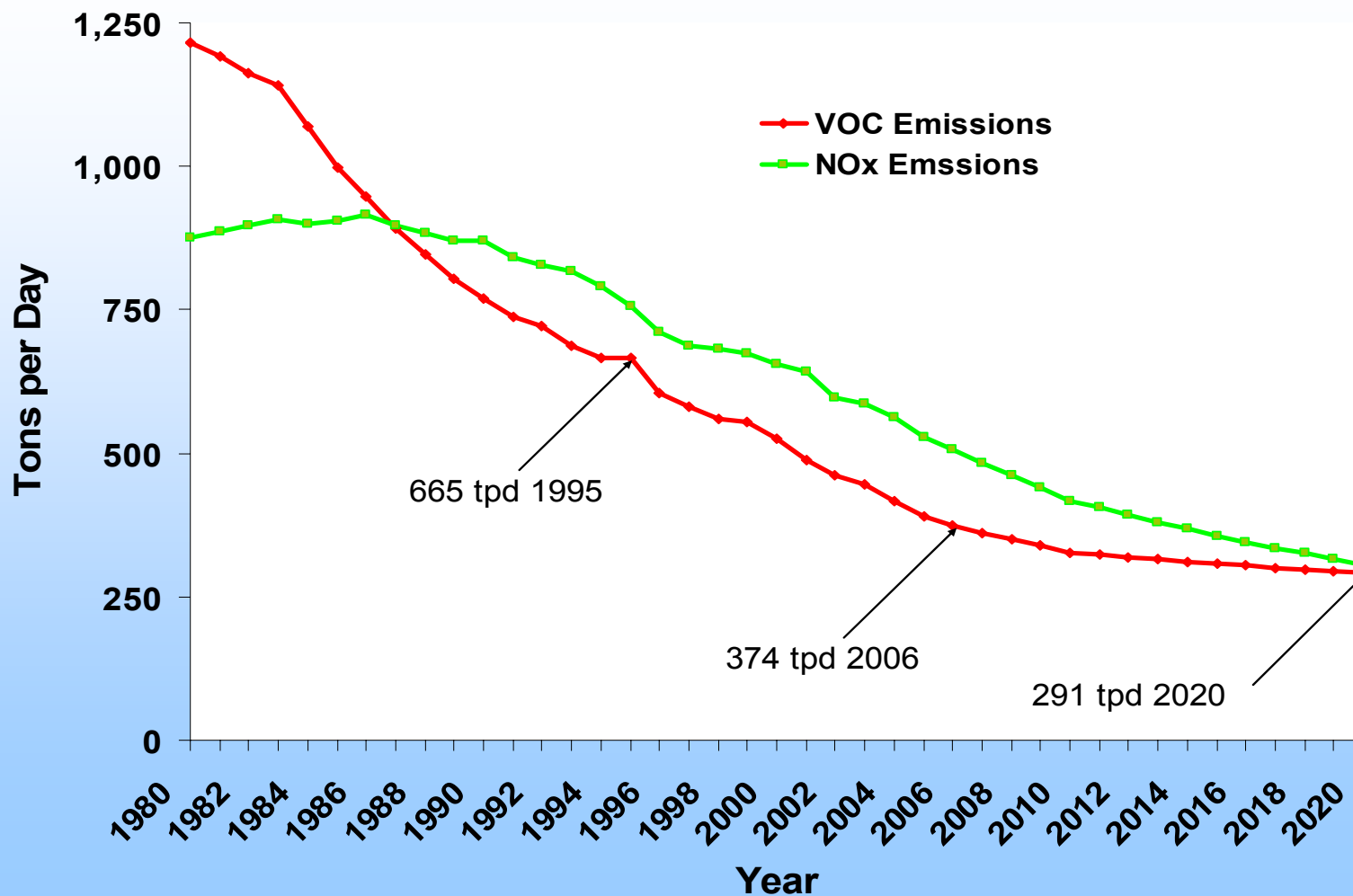
- Automobiles, trucks, buses, aircraft, locomotives
- Construction equipment, lawn & garden equipment
- Large industries and utilities
- Gas stations, print shops, consumer products
- Paints and cleaning products





Ozone Precursors: VOC & NOx Emission Trends

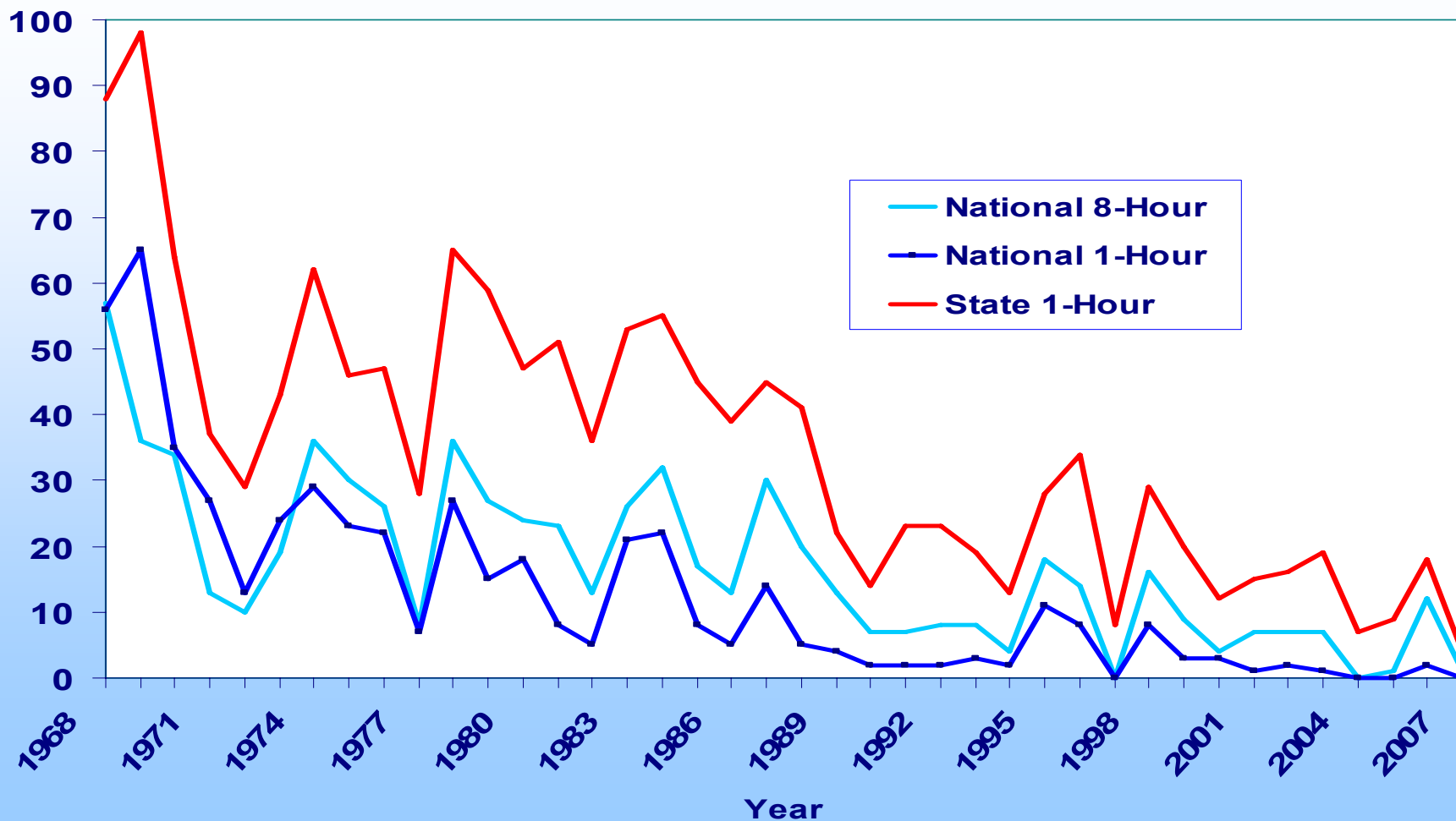
Bay Area VOC and NOx Emission Inventory Trends, 1980-2020





Air Quality Status and Trends

Number of Days of Bay Area Ozone Exceedances Through 2007





Particulate Matter (PM) Basics

PM is small liquid & solid particles

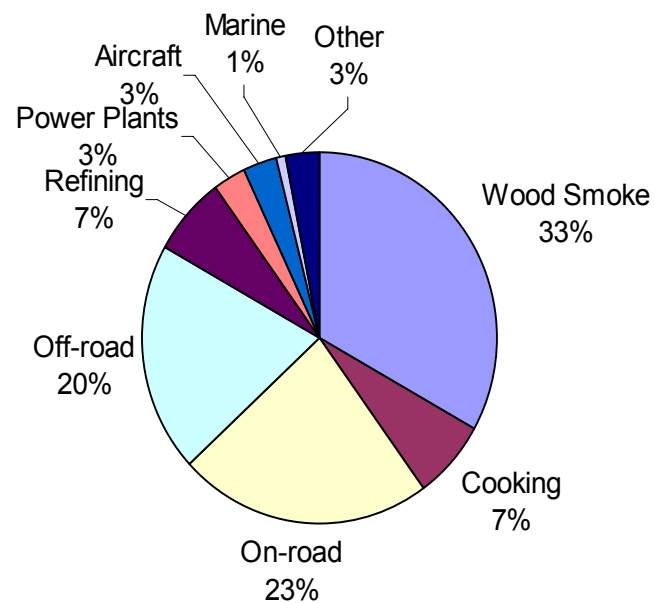
- Smaller than 2.5 microns = **PM2.5**
- Smaller than 10 microns in size = **PM10**
- **Direct PM emissions** – combustion, wood burning, power plants, industrial facilities, construction, agriculture
- **Secondary PM** – formed from precursor pollutants: NO_x, SO_x, VOC, NH₃

PM levels are highest in winter months

PM affects health

- Penetrate deep into lungs, enter bloodstream
- Aggravated asthma, increased respiratory symptoms, chronic bronchitis
- Respiratory & cardiovascular hospitalizations
- Permanent decreased lung function in children
- Lung cancer and premature deaths

Sources of PM emissions





Toxic Air Contaminants (TAC) Basics

Toxic Air Contaminants

- ARB has identified ~ 260 toxic air contaminants
- Bay Area: benzene, 1-3 butadiene, acrolein, hexavalent chromium, formaldehyde
- TACs are regulated at emission source, rather than concentration-based standards
- Most TACs are directly emitted



TAC affects health

- Can cause serious health effects in low concentrations
- Range of effects: acute, chronic, carcinogenic
- Neurological and reproductive disorders



Diesel PM

- Identified by ARB as a TAC in 1998
- Contains more than 40 air toxics
- Contains compounds known to damage DNA and cause cancer
- 80 percent of airborne cancer risk from breathing toxic air pollutants in Bay Area stems from diesel exhaust particles
- ARB aims to reduce DPM emissions by 90 percent (DRRP, 2000)



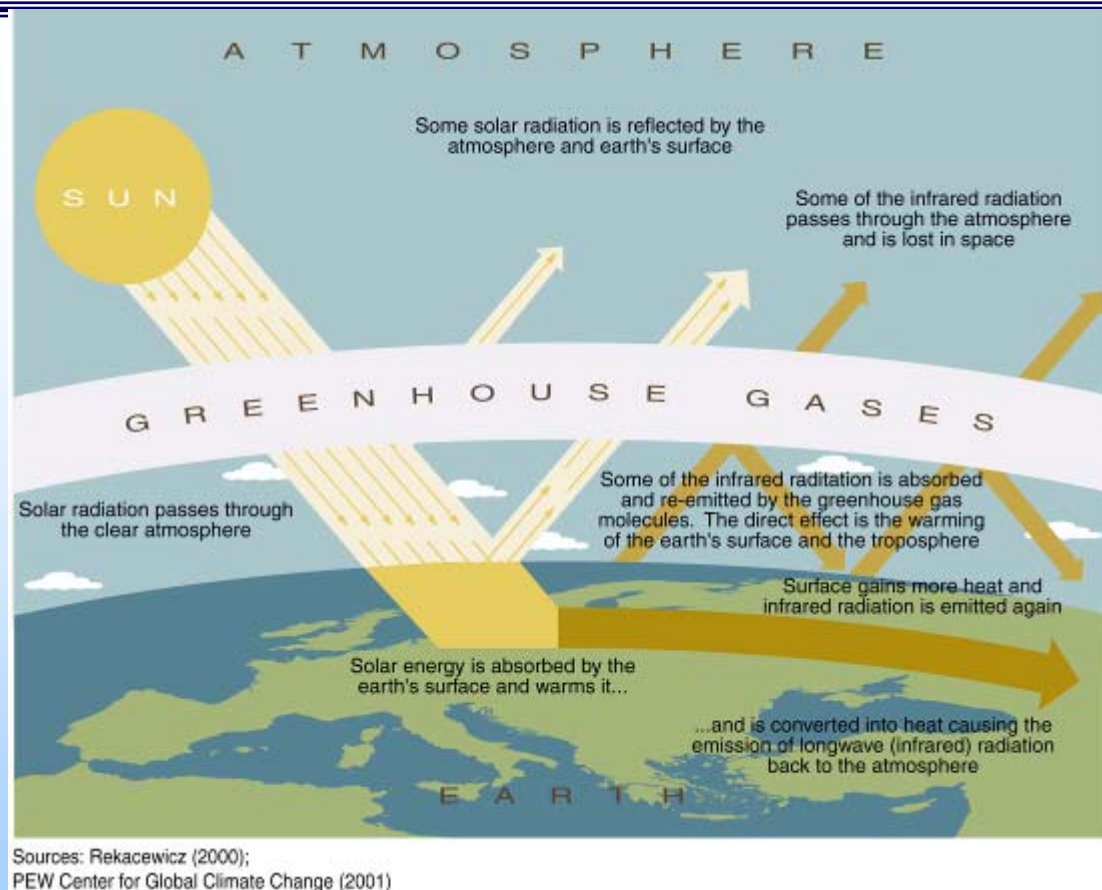
Greenhouse Gas (GHG) Basics

Kyoto greenhouse gases

- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

Environmental effects in California

- Higher temperatures/heat waves
- Shrinking Sierra snowpack/water shortages
- Rising sea and bay levels
- Damage to crops and wildlife
- More wildfires
- Aggravated air quality problems





Climate Change & Air Quality

- Climate Change & Air Quality: two-way street
- Predicting impact of climate change on AQ is very complex, especially at local level
- Impacts may not be experienced at source
- Ozone & methane act as greenhouse gases
- PM can both reduce & increase warming:
 - aerosols scatter light, reduce warming
 - black carbon absorbs heat → more warming



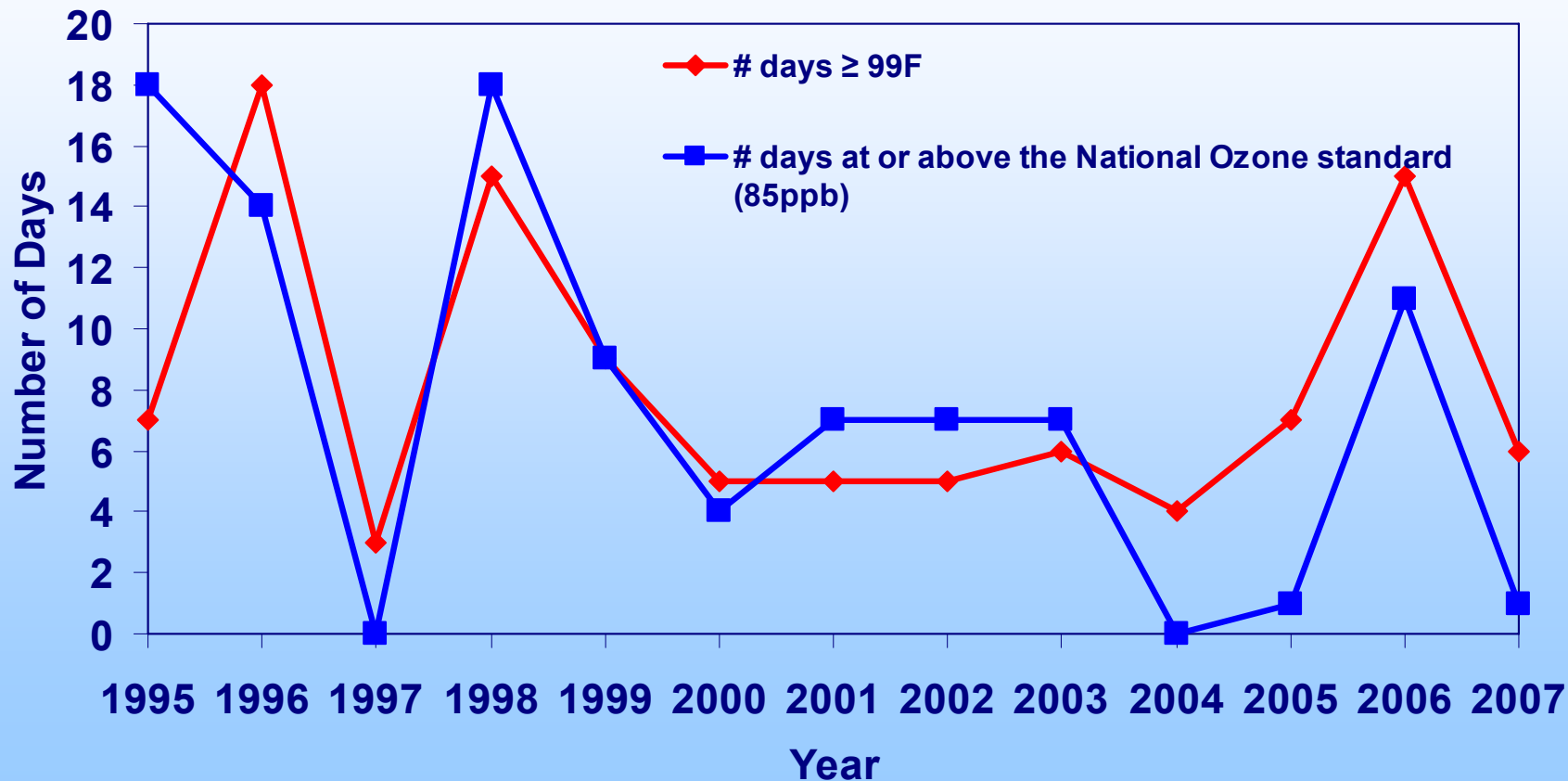
Climate Change & Air Quality

- Higher temperatures increase VOCs emissions (a key ozone precursor) from both:
 - natural sources: trees and vegetation
 - man-made sources: evaporative emissions
- Higher temperatures increase ozone formation: more robust photochemistry
- More wildfires create more ozone & PM
- Strong correlation between # of hot days and # of ozone exceedances



High Temperatures → Ozone Exceedances

Higher temperatures → increased emissions of ozone precursors +
heightened photochemistry = increased ozone formation



Climate Change Increase in Extreme Heat

Number of Extreme Heat days per Year
San Francisco Bay Area, 2070-2099

140
120
100
80
60
40
20
0



Currently

Low Warming
Scenario

Mid Warming
Scenario

Higher Warming
Scenario



Questions / Comments



Regulatory Authority

- **Regional Air Pollution Control Agencies**
 - Primary regulatory authority over stationary sources
- **California Air Resources Board**
 - Intrastate mobile sources—cars, trucks, cargo handling equipment
- **U.S. EPA**
 - Interstate mobile sources—trains, aircraft & ocean going vessels





2009 Clean Air Plan

California Clean Air Act key requirements:

- Report on progress, update baseline & trends
- Achieve state standards by earliest practicable date
Reduce transport to neighboring air basins
- Develop control strategy, including “all feasible control measures”

CAP will be regional in scale

Will improve air quality in impacted communities



Elements of Control Strategy

Control Strategy: overall plan for District actions for the 2010-2012 timeframe & beyond

- **Stationary Source Control Measures** (factories, refineries, dry cleaners, etc.) via rules & regs
- **Transportation Control Measures** - to reduce vehicle travel & emissions – with partner agencies
- **Mobile Source Measures** - promote use of cleaner vehicles & fuels: through incentives, grants, etc.



A Collaborative Effort

Regional agency partners:

- ABAG, BCDC, MTC
- Work with MTC & other regional partners to develop TCMs
- Work with Joint Policy Committee to integrate transportation, land use, AQ
- Coordinate with key regional plans: Transportation 2035, ABAG Projections, FOCUS





Broader Scope for 2009 CAP

- Existing approach for air quality planning
 - single pollutant, address each pollutant separately
- National Research Council, Jan 04 recommendations
- Address multiple pollutants in one integrated plan
 - **Ozone precursors**
 - **Particulate Matter (PM)**
 - **Air Toxics**
 - **Greenhouse gases: CO₂, etc.**
- Prioritize control measures to reduce health impacts
- Maximize co-benefits to reduce greenhouse gases



Potential Benefits of Multi-Pollutant Planning

- Integrate all air pollutants in planning & modeling
- **Maximize co-benefits / avoid trade-offs**
- Better justify potential control measures by estimating benefits on multi-pollutant basis
- Prioritize measures that offer most health benefit
- Better integrate planning for land use, transportation, energy and climate protection
- Help regulated community plan for compliance
- Holistic approach will benefit the public

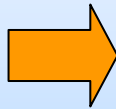
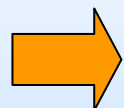
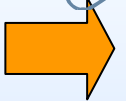


Challenges

- Multi-pollutant (MP) planning is more complex
- Lack of guidelines or models
- Pollutants differ in important ways:
 - sources, precursors, formation
 - range & severity of health effects
 - scale: local / regional / global
 - seasonal peaks: winter (PM) / summer (O₃)
 - timeframe: short-term v. long-term
- How to evaluate control measures on MP basis?

One Potential Approach: Analysis of Health Impacts

Meteorology



Emissions

Concentrations

Exposure

Health Effects

Costs



Planning Schedule and Public Input

- Fall 2008
 - Identify & review potential control measures
 - Develop evaluation methodology
- Early 2009
 - Preliminary control measures & control strategy
 - CEQA Notice of Preparation
- Summer 2009: Issue draft Plan & draft CEQA document
- Fall 2009: Adopt final Plan & final CEQA document
- District will engage in robust public outreach throughout the Bay Area: workshops, community meetings, etc.



Summary of Key Points

- Great progress in improving Bay Area air quality in recent decades
- Need to make further progress
- Climate change will complicate our challenge
- Integrated multi-pollutant planning makes sense
- Goals of 2009 CAP:
 - **Improve air quality**
 - **Protect public health**
 - **Protect our climate**



Bay Area 2009 Clean Air Plan website:

http://www.baaqmd.gov/pln/plans/ozone/2009_strategy/index.htm

Questions / Comments?

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