

# AIR POLLUTION RESEARCH

July 21, 2005

California Environmental Protection Agency

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**Air Resources Board**

# Presentation Overview

- **Research Program Overview**
- **Strategic Plan for Research, 2001-2010**
- **Planned Air Pollution Research, FY 2005/06**

# Research Program Overview

- **Established by Health and Safety Code, 1971**
- **Basis for regulatory actions**
- **Overseen by Research Screening Committee**
- **Managed by ARB's technical staff**

# Role of Research Screening Committee

**On behalf of the Board:**

- **Provides guidance on research plans**
- **Reviews and provides technical comments on:**
  - **Research proposals**
  - **Final reports**
  - **Other aspects of the research work**

# Presentation Overview

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- Planned Air Pollution Research, FY 2005/06

# Strategic Plan for Research 2001-2010



**10-year roadmap  
for  
air pollution  
research**

# Objectives

- **Reduce Emissions and Exposure to Particulate Matter**
- **Characterize and Reduce Community Exposure to Air Pollutants**
- **Promote Zero and Near-Zero Emission Technologies**

# Regulatory and Policy Drivers

- **Ambient Air Quality Standards**
- **Environmental Justice Program**
- **State Implementation Plans**
- **Diesel Risk Reduction Plans**
- **Climate Change Mitigation**

# Categories

- **Health and Welfare Effects**
- **Exposure Assessment**
- **Technology Advancement and Pollution Prevention**
- **Global Air Pollution**

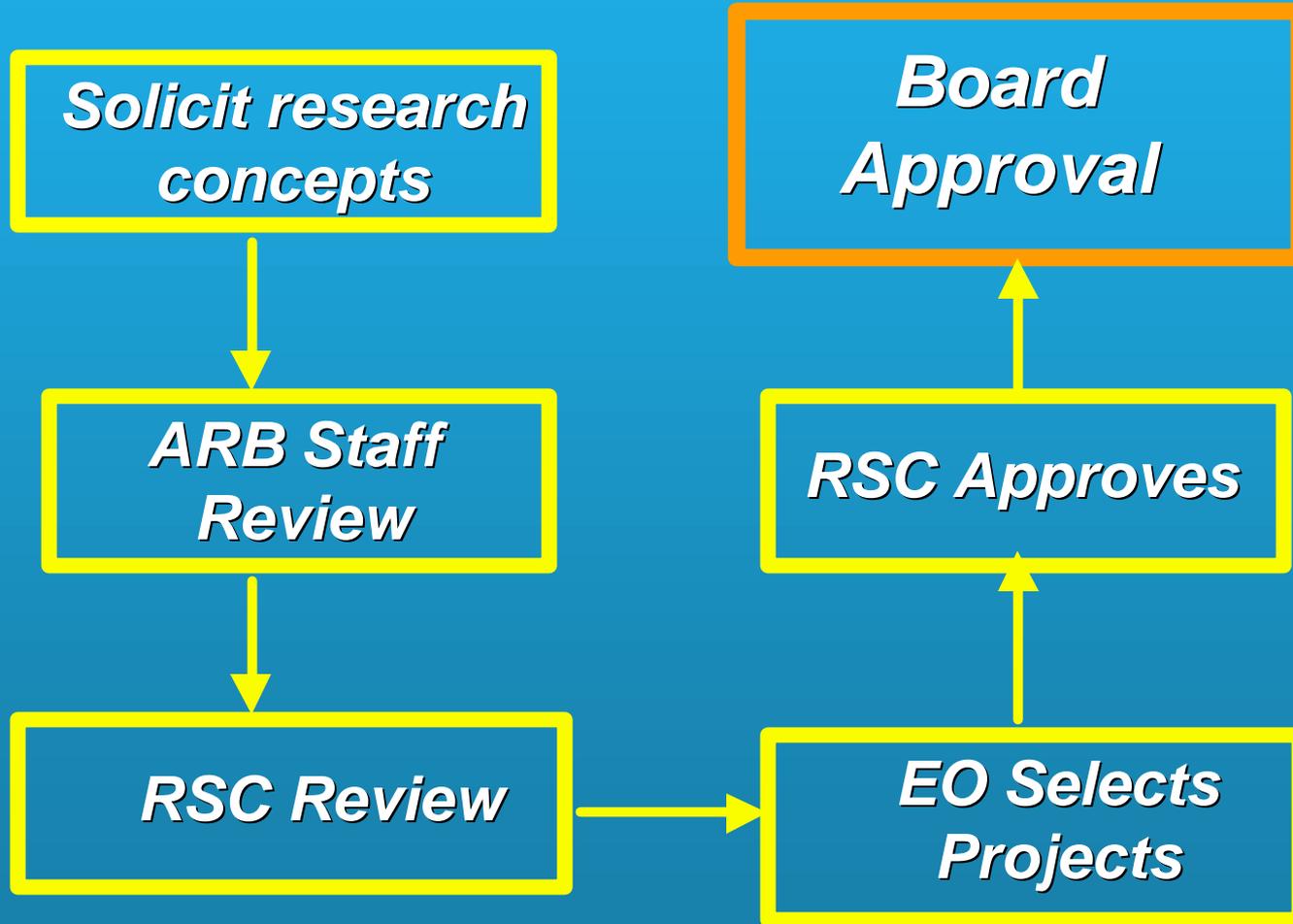
# Presentation Overview

- Research Program Overview
- Strategic Plan for Research, 2001-2010
- **Planned Air Pollution Research for 2005/06**



**Planned Air Pollution Research  
Fiscal Year 2005-2006**

# Research Planning Process

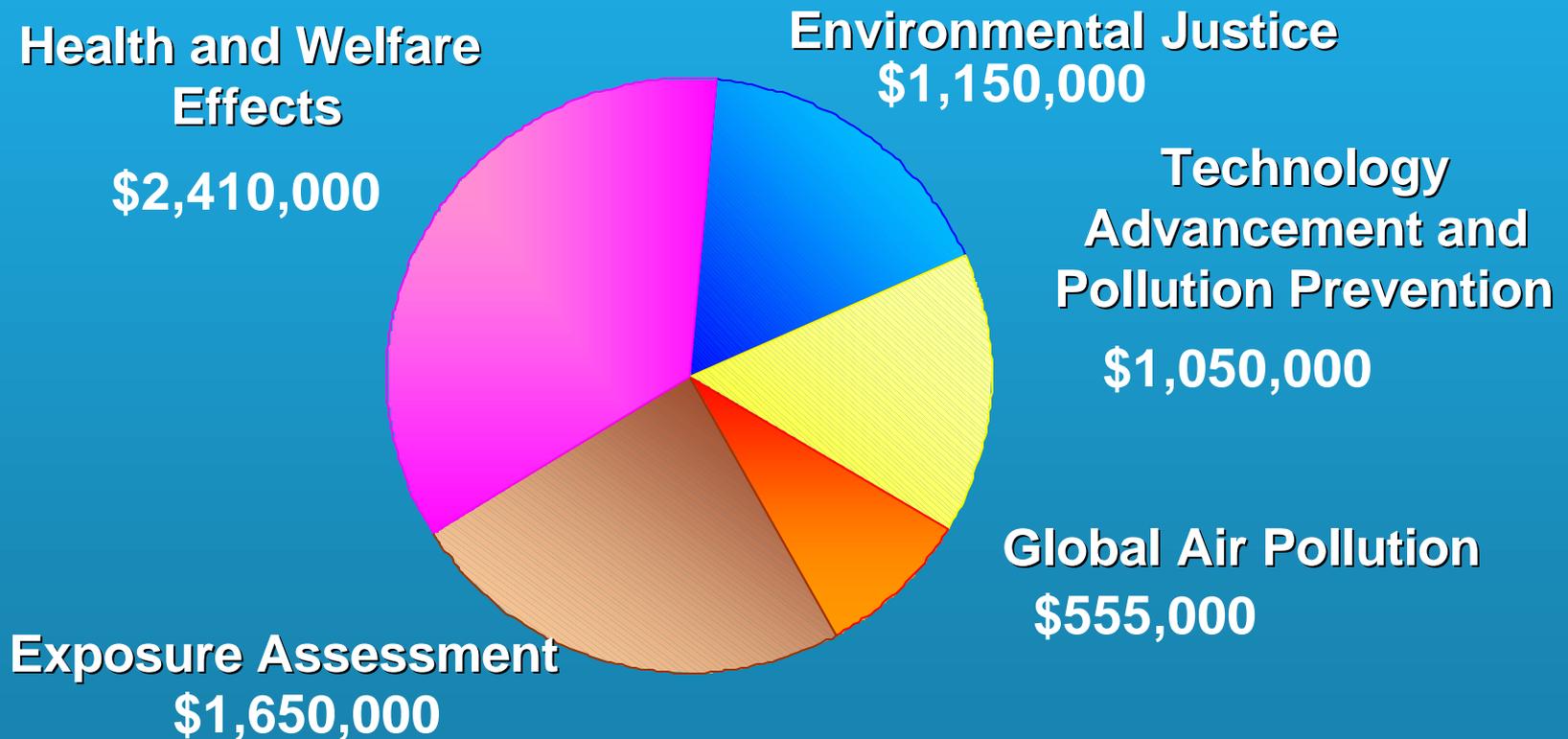


# Proposed Research Projects

- **27 Recommended Projects**
- **5 Research Categories**
- **Budget Allocations**
- **Specific Projects**

# Research Division Budget

## \$6,800,000



# Annual Plan Presentation

- **5 categories**
- **Project listing under each category**
- **Highlight specific projects**
- **Recommend acceptance**

# Environmental Justice Projects

- **Saturation monitoring of selected pollutants in Wilmington**
- **Community scale spatial variability of ultrafines**
- **Mobile monitoring of ultrafine PM near roadways**

# Saturation Monitoring of Selected Pollutants in Wilmington



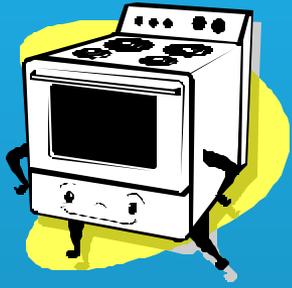
What is the actual exposure to pollution in an EJ community?

# Health and Welfare Effects Projects

## Health Effects from PM

- Health impacts of PM from indoor sources
- Effects of ultrafine particles on lung growth
- Health effects of short-term PM exposure
- Continuation of Fresno Asthmatic Children's Environment Study (FACES)

# Health Impacts of PM from Indoor Sources



To what extent do indoor sources contribute to PM health effects?



# Health and Welfare Effects Projects

(continued)

## Cost Analysis

- Life-cycle cost analysis of air pollution regulations
- Follow-on to car purchase model
- Economic value of avoiding air pollution related health outcomes
- Health benefits of improvements in air quality

# Exposure Assessment Projects

## Atmospheric Processes

- Impact of halogen gases in coastal areas on downwind ozone levels
- Effects of freeway barriers on PM dispersion

# Exposure Assessment Projects

(continued)

## Emission Inventory

- **Process-based emission farm model for dairies**
- **Measuring agricultural fumigant pesticide emissions**
- **Species profiles from diesel combustion in ships**
- **On-road measurements from light & heavy duty vehicles**

# **Exposure Assessment Projects**

**(continued)**

## **Personal and Indoor Exposure**

- **Ultrafine particle concentrations in schoolrooms and homes**
- **Survey of ozone-generating air cleaners**

# Processed Based Farm Model



How do we  
obtain  
accurate  
emission  
rates from  
dairies?

# Technology Advancement and Pollution Prevention Projects

## Enhanced Emission Monitoring

- Evaluate Europe's particle number emissions methodology
- Characterize light-duty high PM emitters
- CO<sub>2</sub> emission quantification from vehicle A/Cs
- Hourly monitoring of acrolein in ambient air

# Evaluate European Particle Number Emission Methodology



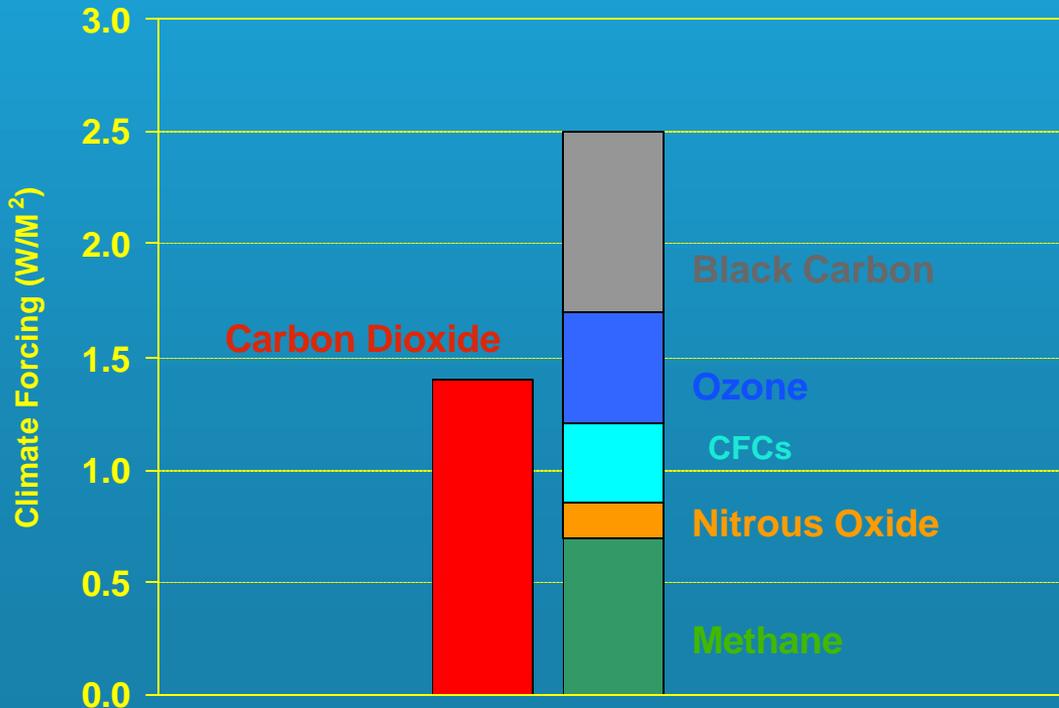
Can California potentially use the PMP method for in-use compliance testing?

# Global Air Pollution

- Evaluate greenhouse gas emissions from the petroleum sector
- Improve CO<sub>2</sub> emission estimates from fossil fuel combustion
- Clearinghouse of technological options for reducing non-CO<sub>2</sub> greenhouse gas emissions
- Climate change impact on urban air quality in California

# Clearinghouse of Options for Reducing Greenhouse Gas

Global Climate Warming  
1850-2000



What  
technology  
options are  
available for  
reducing  
non-CO<sub>2</sub>  
emissions?

# **Recommendation**

**Approval of the  
Planned Air Pollution Research for  
Fiscal Year 2005-06  
(Resolution No. 05-36)**





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# RESEARCH PROPOSAL

*July 21, 2005*

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# Health Benefits of Improvements In Air Quality (Augmentation)

University of California, Berkeley  
Professor Ira Tager  
\$175,000

**Objective:** Refine technique to quantify the health benefits associated with air quality improvements and application of additional pollutants and health end points.

**Expected Results:** Health benefits associated with reducing PM and ozone.

# **Recommendation**

**Approval of the  
Research Proposal**

**“Health Benefits of Improvements in  
Air Quality”**

**(Resolution No. 05-37)**

# RESEARCH PROPOSAL

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