CALIFORNIA
AIR RESOURCES BOARD

Proposed Five-Year Strategic Research Plan for 2025-2030
Item 25-6-7 and Resolution 25-8

Board Meeting – September 25, 2025

CALIFORNIA
AIR RESOURCES BOARD

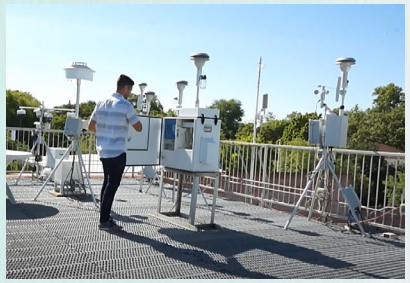
1970s

1980s

1990s

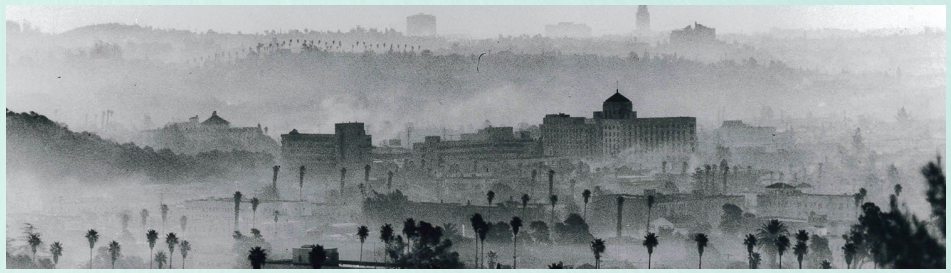
2000s

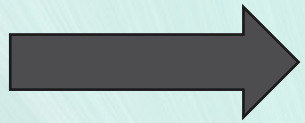
2010s

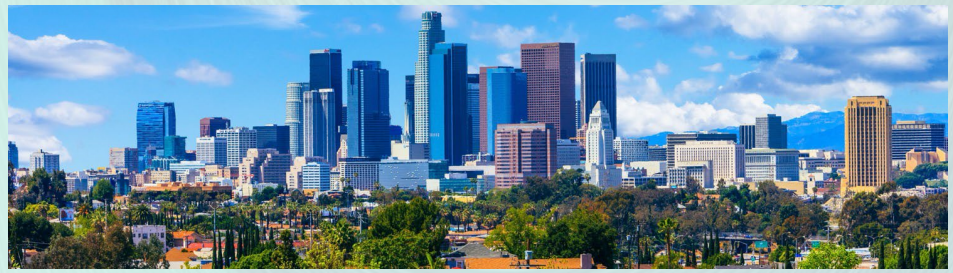


Now

For nearly 60 years, CARB has relied on robust science to deliver clean air and support major breakthroughs in clean technology and fuels

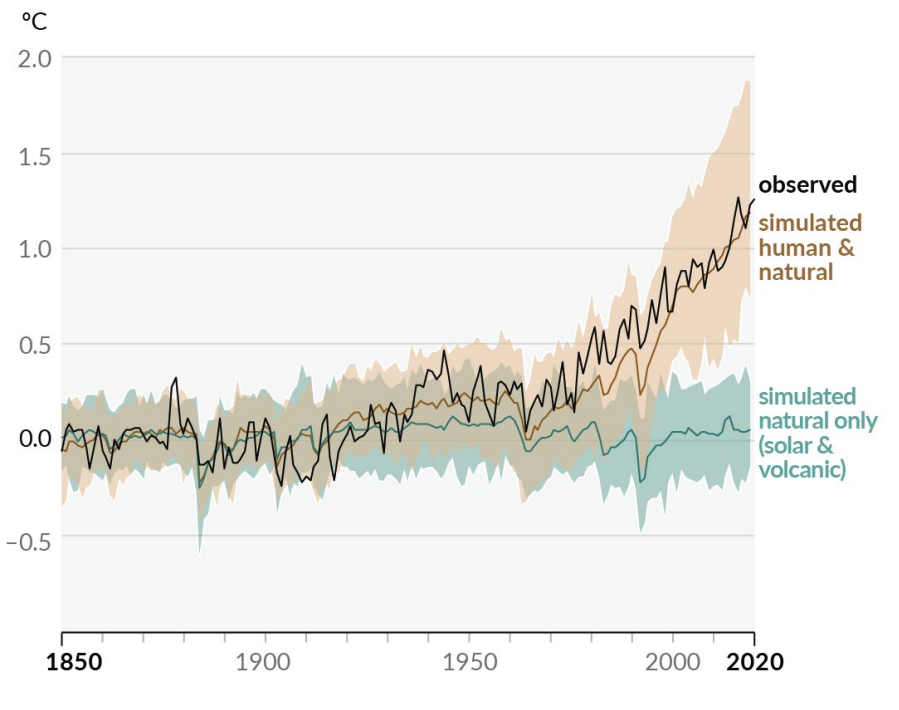






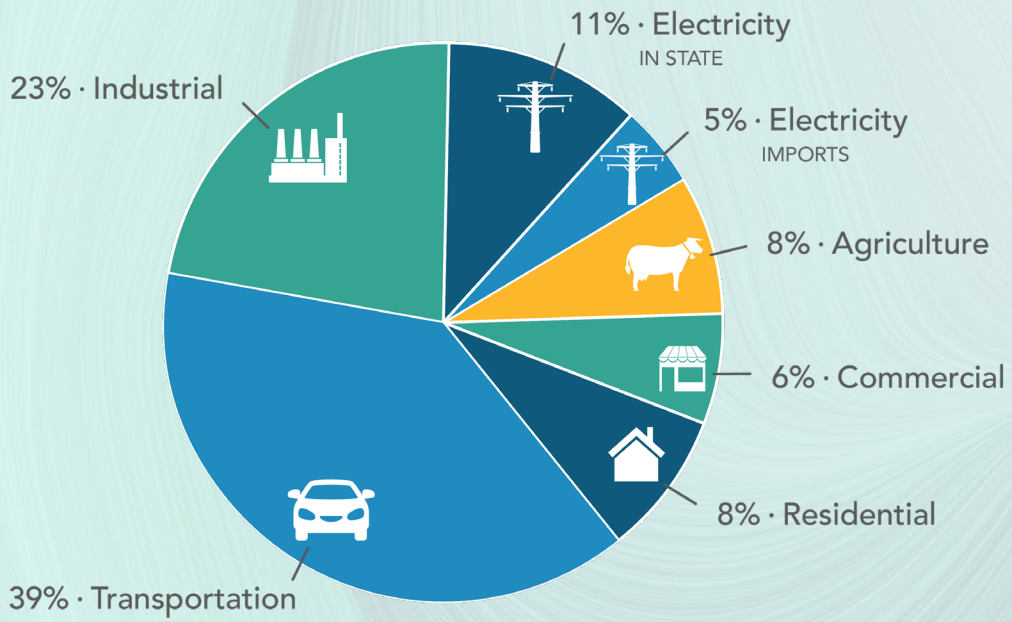
Scientific Consensus on Climate Change

Human influence on climate is undeniable, and climate change will worsen natural disasters



Source: IPCC AR6 WGI SPM Figure 1

Reducing greenhouse gas emissions from vehicles is critically important for preventing irreversible damage to our environment and reducing harmful local air pollution



371.1 MMT CO_2e
2022 TOTAL CA EMISSIONS

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Undeniable Reality and the Need for Action

Loss of Snowpack

Sierra Nevada
2020

Extreme Drought

Lake Mendocino
2021

Larger Wildfires

Palisades Fire
2025

Our Response to U.S. Department of Energy "Study"

CARB filed public comments citing hundreds of scientists and research studies, presenting robust data that highlight the growing impact of climate change, including evidence that:

- Climate change impacts public health and the economy
- Reducing GHGs lead to significant co-benefits
- Threats from climate-related risks and climate change impacts are growing
- Scientific consensus on the negative impacts of climate change remains strong

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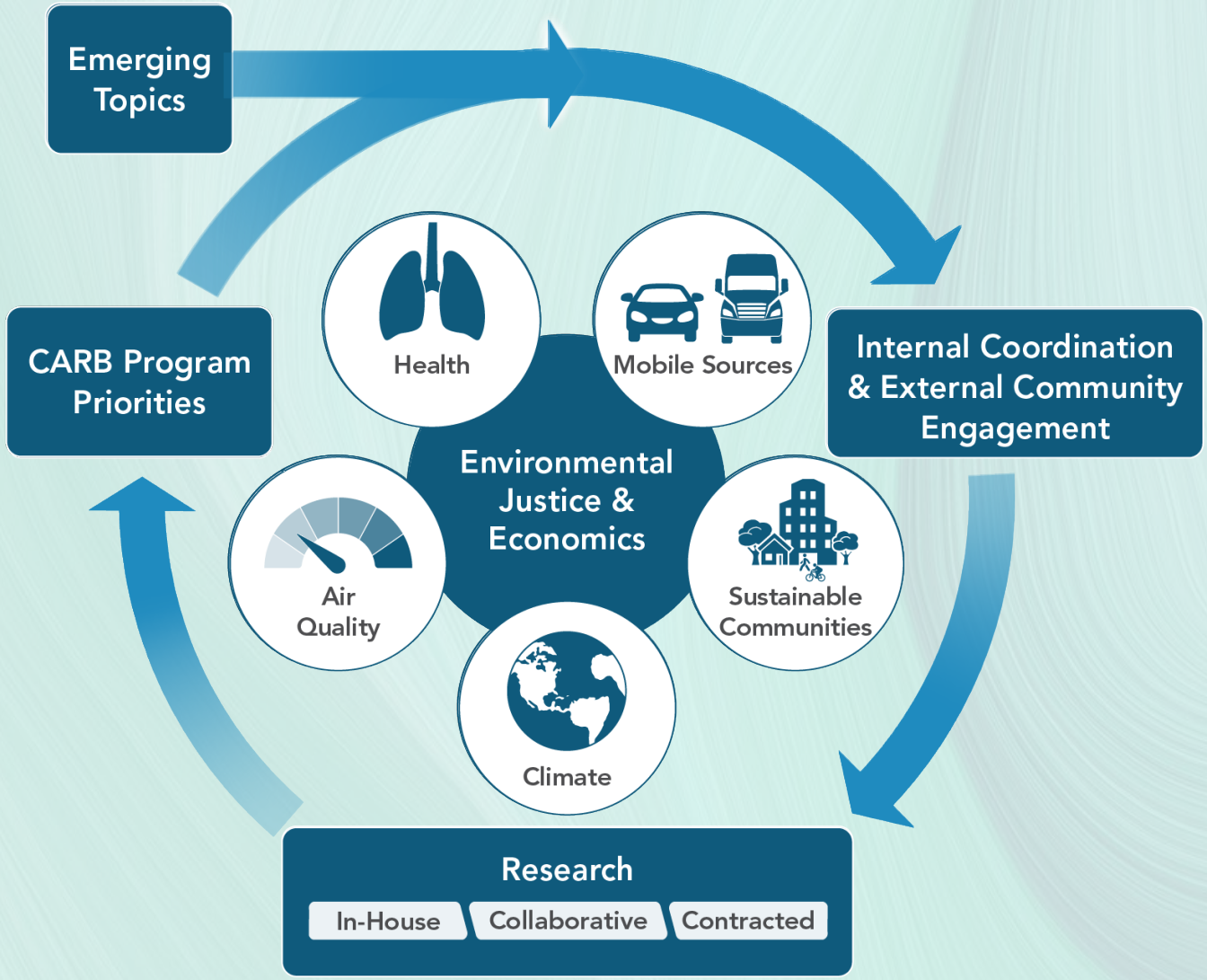
Commitment to Uphold Science

CARB Research Program Overview



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Impact of CARB Research

Shapes California's air quality and climate policies

Supports decision-makers

Identifies emerging vulnerabilities

Provides valuable insights for other regions

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Research Highlight

Monitoring Methane with Satellites

What was found?

Detect large sources of methane over California, enabling rapid mitigation

Why is this work important?

Supports meeting State target to cut methane emissions by 40%

How can satellite data be used?

Integrated into oil and gas regulation
Being considered for other regulations

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Research Highlight

Lowering NOx using Conventional Technology

What was found?

90% reduction in NOx for Heavy-Duty Engines

Why is this work important?

Today's technology can achieve ultra-low NOx

How were results used?

Led to creation of regulations at the State and Federal level used to reduce emissions

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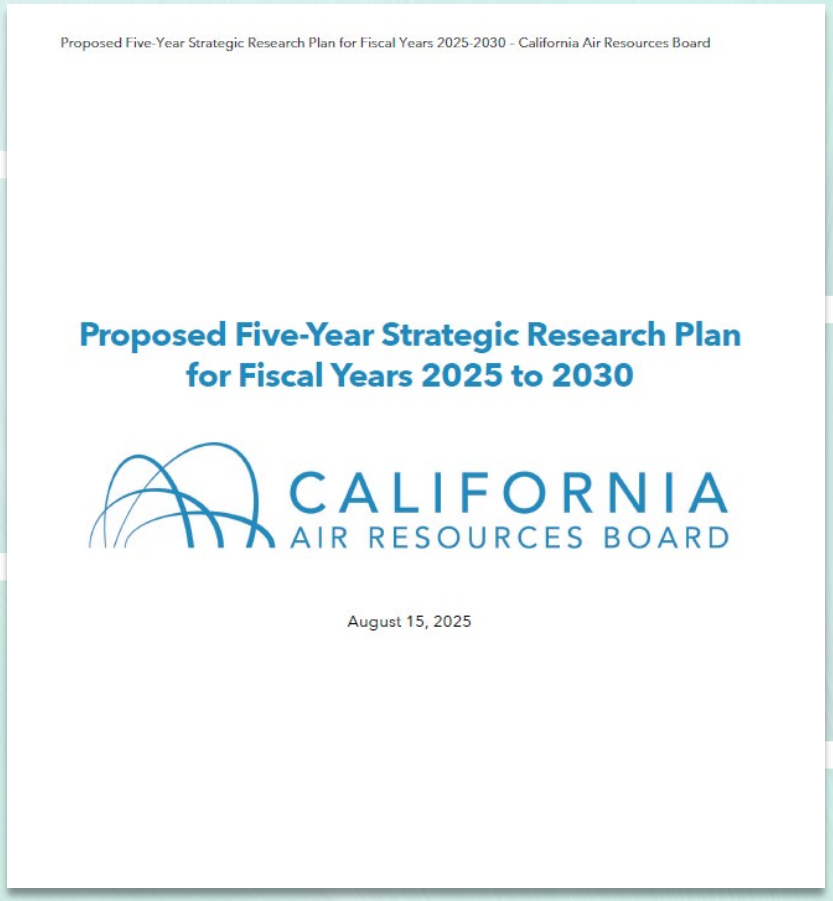
The Five-Year Strategic Research Plan

Outreach

Strategy

- Policy
- Timely Drivers
- Gaps



Summary of our Research

- Past
- Current
- Highlights

Research Priorities

- Guides Annual Research Planning

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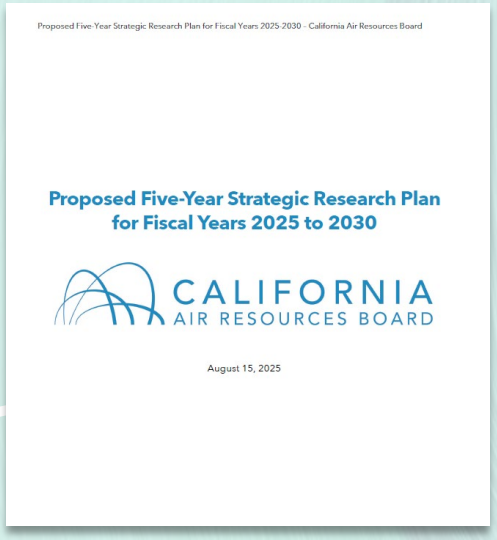
Turning Priorities into Research

Resources Available

- Externally Research Funded Annually
  - $4-$8 M
  - 5-12 Projects
- Internal and Collaborative Research
  - In-house research
  - Co-funding
  - Shared equipment

Guides Annual Research Planning



Selection of timely research priorities from 5-Year Plan → **Public poll & comment collection** → **Final approval** → **Project development**

How Was this Plan Created?

Internal Process

Identify Program needs and research gaps

Public Engagement

Meetings
Surveys

Community-Based Organization Partnerships

CBO Recruitment Meetings

Incorporate Future Priorities

Finalize Plan

Present to the Board

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Turning Community Concerns into Robust Science

AB 617 Meeting

Community Concerns:

Salton Sea playa dust exposure health impacts

Community Informed Research

Community Engagement Model

Racial Equity Lens

Dust on the Horizon

Community-engaged research examining the relationship between health and dust exposure

Community webinars to identify community research needs and current science

Supports the development of a research project

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Future Research Priorities

Health Research

Health Impacts of Climate Change and Wildfire Smoke

Indoor Health Pollution Sources, Exposure, and Mitigation

Health Analysis

Air Toxics

Community-level Exposures and Disparities

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Ambient Air Quality Research

Understanding the Drivers of Future Ambient PM2.5 Formation

Understanding the Challenges of Meeting NAAQS in a Changing Climate

Air Quality Impacts of Ambient Volatile Organic Compounds

Air Quality Impacts of Dairy and Agricultural Operations

Reducing Air Quality Disparities

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Climate Research

Greenhouse Gas Emissions and Sinks from Natural and Working Lands

Measurement Systems on Local and Statewide Scales

Dairy Emissions from Changes in Management Practices

New Refrigerant Technologies and Recycling of Existing Refrigerants

Wildfire Emissions in a Changing World and Impacts on Environmental Justice Outcomes

Climate Change Impacts on Health, Economics, and Other Factors

Equitable Transition to a Low-Carbon Future

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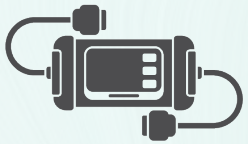
Mobile Sources Research

Long-term Trends in NOx and Greenhouse Gas Emissions

Advances in Mobile Sources Monitoring



Understanding Mobile Source Emission Disparities

Activity and Vehicle Energy Analysis

Controlling and Monitoring Off-Road In-Use Emissions

Incentives, Zero Emission Vehicles, and Charging Infrastructure

Improving Understanding of Non-Exhaust Emissions

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Sustainable Transportation, Housing, and Communities Research

Sustainable Communities and Climate Mitigation

Building Decarbonization and the Built Environment

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Next Steps and Staff Recommendation

- Recommendation
  - Approve Resolution 25-8

- Impact
  - Update and release the final draft of the Five-Year Plan
  - Delegate authority to the Executive Officer to approve contracts
  - Staff initiate development of research priorities
  - Provide annual updates to the Board on key research priorities