



Proposed 2011 Research Plan



California Air Resources Board

California Environmental Protection Agency

Today's Proposed Action

Approval of 2011 Research Plan

Next Steps

- Development of full proposals
- Research Screening Committee (RSC) review
- Board approval of projects

Outline

- Planning process
- Research Themes
- Proposed projects
- Recommendation

2011 Plan Development

- Board discussion with RSC in February
- Annual public solicitation
- Staff analyses of research gaps
- Interagency coordination

Planning Considerations

- Integrate air quality and climate programs
- Recognize air quality, energy, land use, and transportation linkages
- Identify research gaps focused on ARB program priorities

2011 Research Themes

- Foundational Research
- Air Quality and Energy
- Sustainable Communities
- Behavior and Technology

A grayscale photograph of a mountain landscape. In the background, a large, rugged mountain peak is covered in patches of snow. The mountain's reflection is clearly visible in a calm body of water in the middle ground. The foreground shows some rocks and sparse vegetation. The overall scene is serene and natural.

2011 PROPOSED PROJECTS

A white SUV is parked on a street with its rear hatch open. The interior of the hatch is filled with various pieces of electronic equipment, including a laptop and several boxes, all secured with straps. A tall, thin metal pole with a sensor or camera at the top is mounted on the roof of the vehicle. The background shows a typical urban street with trees, other vehicles, and buildings. The text "FOUNDATIONAL AIR POLLUTION RESEARCH" is overlaid in large, bold, dark blue letters across the lower half of the image.

FOUNDATIONAL AIR POLLUTION RESEARCH

Foundational Research

- Protecting Health
- Attaining Air Quality Standards
- Meeting Climate Change Targets

A black and white photograph of a group of children playing outdoors. In the center, a girl is being carried piggyback by another child. To their right, a boy is being carried piggyback by a girl. They are all smiling and appear to be in motion, possibly running or jumping. The background is filled with out-of-focus trees and foliage, suggesting a park or a wooded area. The overall mood is joyful and carefree.

PROTECTING HEALTH

Research Highlights

- Provided evidence for biological basis of cardiovascular effects from PM_{2.5} exposure in animal studies
- Associated roadway exposures with risk of asthma in children
- Identified unhealthful formaldehyde exposures in new homes

Protecting Health

Recommended Research Projects



Assess exposure and efficacy of in-home filtration for children with asthma



Identify the most effective filtration and ventilation systems for homes to support asthma study



Evaluate filtration systems for passenger vehicles and school buses



ATTAINING AIR QUALITY STANDARDS

Research Highlights

- Improved technical basis for ozone and PM2.5 attainment strategies
 - Better understanding of the rate of ozone formation
 - Role of chemistry in PM2.5 formation
- Identified air pollution transport from Asia
- Mapped shipping off west coast to support control programs

Attaining Air Quality Standards

Recommended Research Projects



Show how long-range transport of pollution increases background levels



Dairy feed management practices to reduce emissions



Evaluate heavy-duty diesel control technologies



Better understand sources of PM_{2.5} pollution



MEETING CLIMATE CHANGE TARGETS

Research Highlights

- An in-depth review of the sources of high-GWP gases
- A study of options and costs for recovering and destroying high-GWP gases
- Assessment of emissions from fertilizer application to soils
- Study of regional black carbon reductions as climate co-benefit of diesel control

Meeting Climate Change Targets

Recommended Research Projects



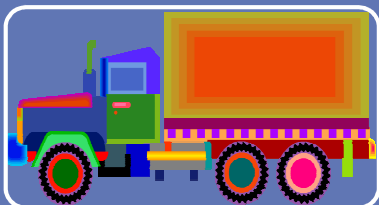
Reduce high GWP emissions from appliance and building waste foams



Reduce N_2O emissions from fertilizer use



Measure GHGs to identify sources and track progress



Impacts of black carbon reductions on California climate indicators



BEHAVIOR AND TECHNOLOGY

Behavior and Technology

Recommended Research Projects



Modeling household vehicle choice and usage



Potential benefits of interactive transportation technologies



Consumer attitudes to low-emission vehicles

In collaboration with CEC, CalTrans, and the UC system

A grayscale photograph of a woman riding a bicycle on a city street. She is wearing a white helmet, glasses, a dark t-shirt, and light-colored pants. She is looking towards the camera. In the background, there is a white car, a stop sign, and other vehicles. The text "SUSTAINABLE COMMUNITIES" is overlaid in the center of the image.

SUSTAINABLE COMMUNITIES

Sustainable Communities

SB 375

Directs California's metropolitan planning organizations to develop strategies that:

- Integrate land use, housing, and transportation planning
- Reduce regional GHG emissions

Health Connections

“People who live in neighborhoods with a mix of shops and businesses within easy walking distance have a 35% lower risk of obesity.”

Lawrence Frank et al. American Journal of Preventative Medicine, 2004



Sustainable Communities

Recommended Research Projects



Economics of Smart Growth Strategies



Benefits of Complete Streets Conversions



Pollutant Co-Benefits of Non-Energy Green Building Retrofits



Improving Financing Programs for Building Retrofits

A photograph of a wind farm on a grassy hill. Several white wind turbines are visible, with one in the foreground being the most prominent. The sky is filled with dramatic, white and grey clouds. The overall tone is slightly desaturated, giving it a professional, documentary feel.

AIR QUALITY AND ENERGY

Air Quality and Energy

Current Research

CEC and CPUC-led research

- Net Zero Energy buildings
- Renewable electricity load balancing
- Electrification scenarios

Gap for ARB to address: Air quality co-benefits

Air Quality and Energy

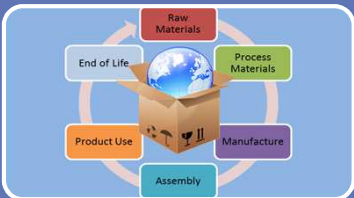
Recommended Research Projects



Air quality co-benefits of clean energy



Air quality and energy impacts of biogas from waste

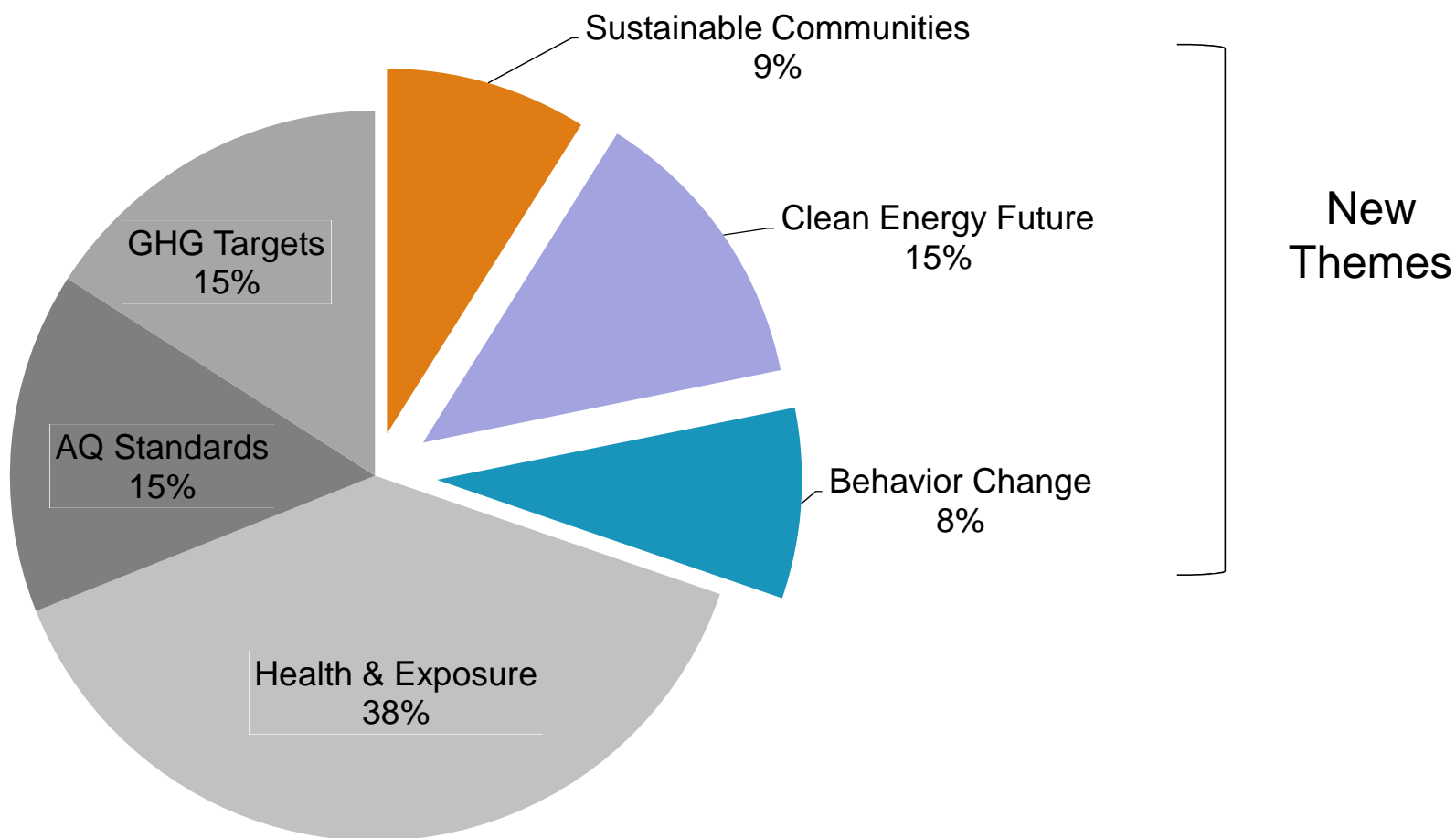


Improved life-cycle assessment (LCA) tools



Goods movement truck travel data collection methods

Proposed 2011-2012 Funding Allocations



Financial Stewardship

- 75% of funds stay in California
- Significant leveraging: \$3 to \$1 since 2000
- Low overhead rates

Recommended Action

Approve

Proposed 2011 Research Plan

