Short-Lived Climate Pollutant Reduction Strategy Public Workshop to Discuss Concept Paper

California Air Resources Board
Sacramento, California

May 27, 2015

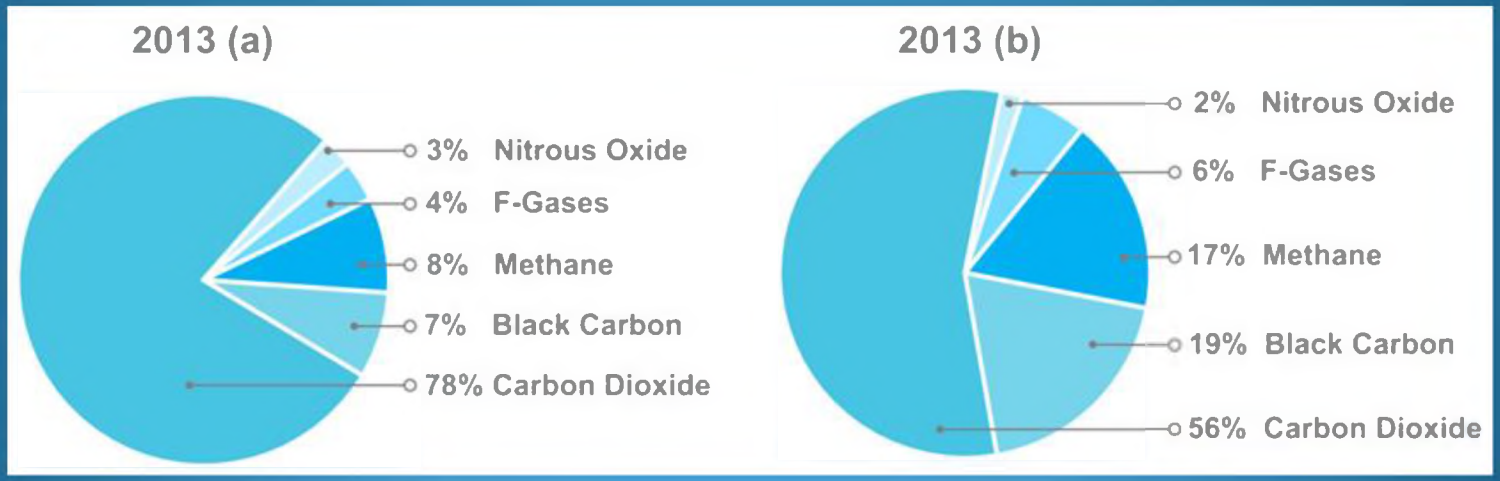
Purpose of Workshop

- Discuss requirements for a Short-Lived Climate Pollutant (SLCP) Strategy
- Discuss initial ideas and potential strategies contained in the Concept Paper released on May 7
- Elicit ideas on these and other potential emission reduction strategies
- Use comments received to inform development of draft Strategy

Short-Lived Climate Pollutants

- Methane, black carbon, fluorinated gases (F-gases, including hydrofluorocarbons)
- Lifetimes of a few days to a few decades
- GWP can be tens to thousands of times greater than CO_2
- Account for about 40% of global warming experienced to date
- Reducing SLCP emissions can make immediate impact on mitigating climate change
- Mitigation of SLCPs is complementary to long-lived pollutants (e.g. CO_2) mitigation

California's 2013 Greenhouse Gas Inventory Using (a) 100-year and (b) 20-Year Global Warming Potential Values



Development of a SLCP Strategy

- Recommended action in the Climate Change Scoping Plan Update
- Required by Senate Bill 605
- Reducing SLCP emissions part of Governor's climate change goals set in his January inaugural address
- Actions in Strategy will support Governor's new target of reducing GHGs to 40% below 1990 levels by 2030

Senate Bill 605 Requirements

- Complete an inventory of sources and emissions
- Identify existing and new control measures
- Identify research needs to address data gaps
- Coordinate with other state agencies and local air districts
- Consult with academic, industry, and community experts
- Hold public workshops during development of strategy
- Complete by January 1, 2016

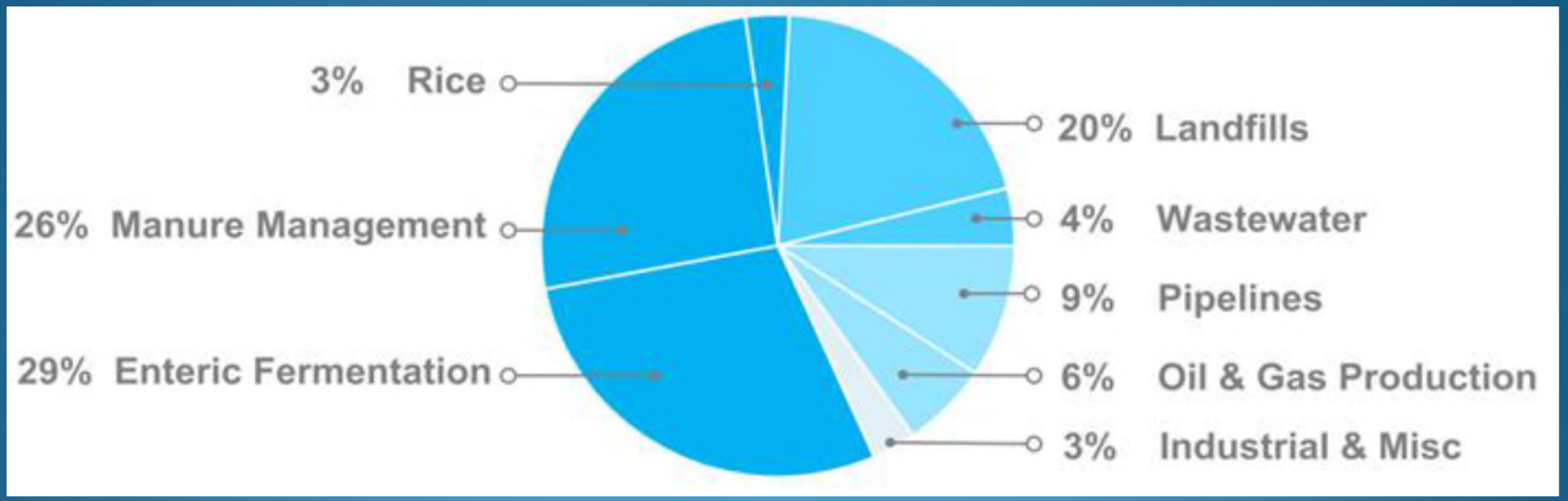
Framing Strategy

- Prioritize actions with multiple benefits
- Put organic waste to its most beneficial use
- Identify practical solutions to overcome barriers
- Improve understanding of SLCP sources and emissions
- Invest in SLCP emission reductions

Potential Targets

- Reduce black carbon emissions by at least 50% below 2012 levels from transportation sources by 2020, and from all sources by 2030
- Reduce methane emissions by at least 20% by 2020, and 40% by 2030 below forecasted emission levels
- Reduce F-gas emissions by at least 25% in 2020, and 50% by 2030 below forecasted emission levels

California 2013 Methane Emission Sources



Current Methane Emission Reduction Efforts

- ARB's landfill regulation
- Existing and proposed offset protocols under Cap-and-Trade program for dairies, coal mines, and rice cultivation
- ARB's development of oil and gas production, processing, and storage rule
- CPUC's development of gas transmission and distribution pipeline leaks rule (SB 1371)

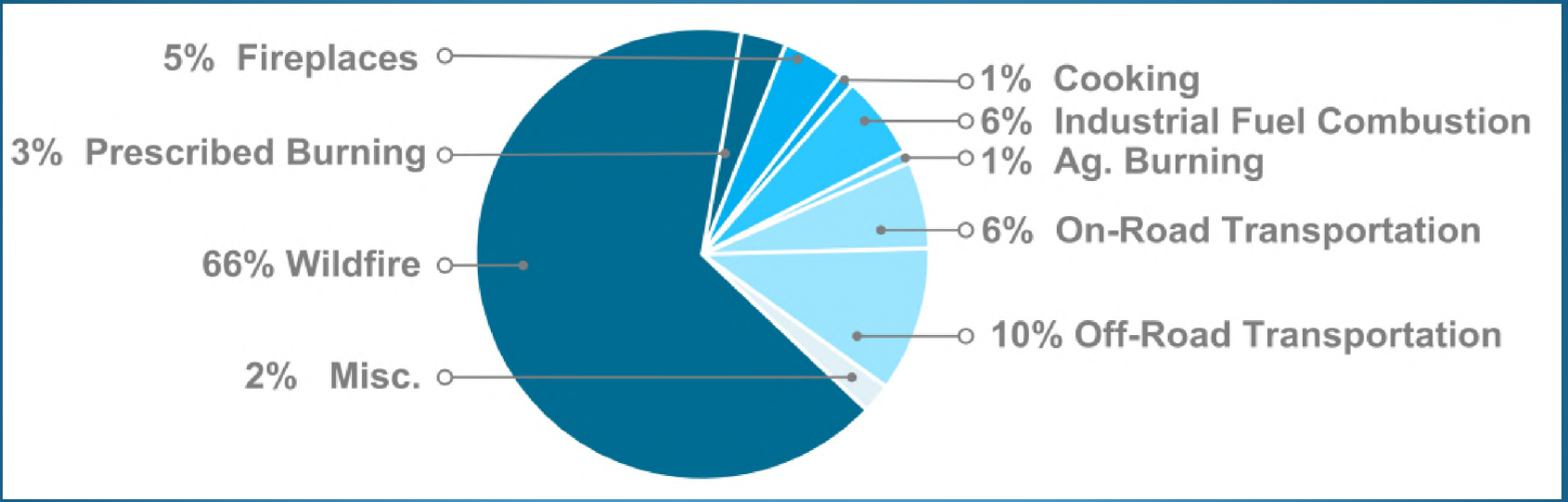
Methane Emission Reduction Concepts

- Minimize fugitive methane emissions from infrastructure and equipment
- Consider fugitive methane emissions in cost/benefit calculations for energy and efficiency programs
- Eliminate disposal of organic materials at landfills
- Significantly cut methane emissions from dairies
- Maximize resource recovery from wastewater treatment facilities

Methane Research Activities

- On-going efforts
  - Cattle enteric fermentation emission estimates
  - Dairy manure emission estimates
  - Emission leaks from NG pipeline systems
  - California methane monitoring network
  - “Hot spot“ methane sources in San Joaquin Valley
- Future needs
  - Potential approaches to reduce food waste
  - Potential investment mechanisms to reduce dairy emissions
  - Statewide survey of super emitters

California 2013 Black Carbon Emission Sources



Current Black Carbon Emission Reduction Efforts

- Anthropogenic emissions are 90% lower than in the 1960s, and will be cut in half again by 2020
  - Diesel-fueled engines and vehicles
  - In-use vehicle requirements
  - Incentive programs for switching to cleaner diesel equipment and vehicles
  - District commercial cooking rules
  - Smoke management programs

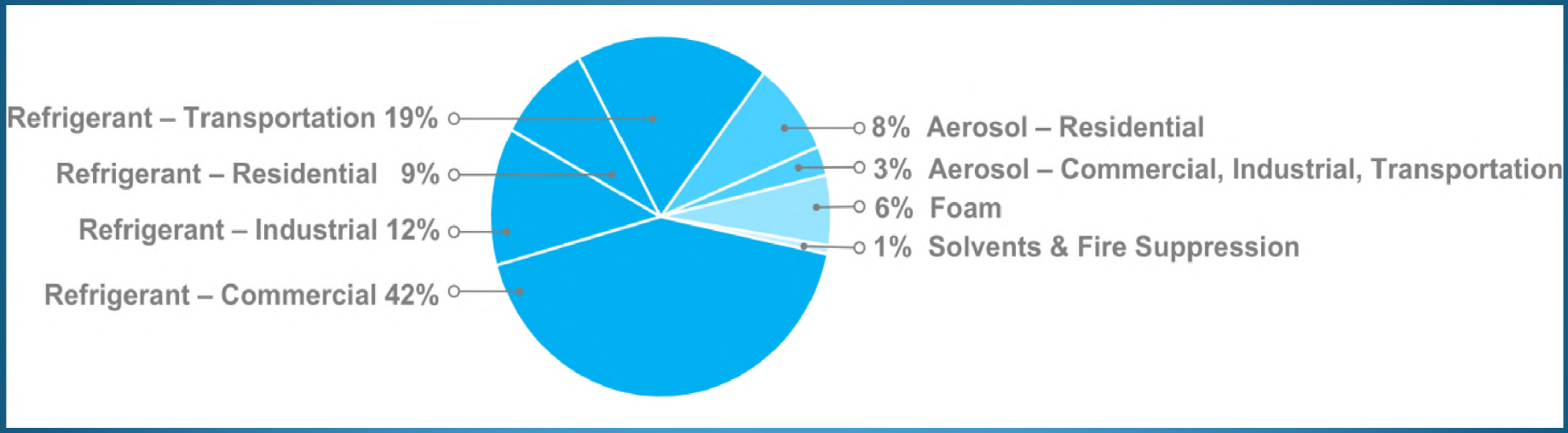
Black Carbon Emission Reduction Concepts

- Continue to reduce diesel black carbon emissions
  - Sustainable Freight Strategy
  - Updates to SIP to achieve federal air quality standards
- Reduce black carbon emissions from biomass burning (wildfires, agriculture burning, open pile burning, commercial cooking, residential burning)
  - Forest Carbon Plan
  - Put woody biomass to most beneficial use

Black Carbon Research Activities

- On-going efforts
  - Improve black carbon emission inventory estimates
  - Characterize biomass burning contribution (black and brown carbon) to climate forcing in California
- Future needs
  - Improve wildfire emission estimates
  - Benefits of biochar projects

California 2013 F-Gas Emission Sources



Current F-Gas Emission Reduction Efforts

- Cap-and-Trade offset protocol incentivizing the capture and destruction of ozone depleting substances
- Regulations adopted under AB 32 expected to reduce emissions 25% by 2020
  - Majority of reductions from Refrigerant Management Program

F-Gas Emission Reduction Concepts

- Reduce the use of HFCs in new refrigeration and air conditioning equipment by at least 80% by 2030
- Remove high global warming potential gases from foams, aerosols, and transportation
- Reduce leaks from existing equipment and at end-of-life
- Target early action to significantly reduce F-gas emissions from commercial refrigeration

F-Gas Research Activities

- On-going efforts
  - Analyze cost, energy usage, performance, and GHG emission reductions associated with alternatives to high-GWP HFCs
  - Evaluate high-GWP GHG emissions from landfilled waste insulating foam
  - Conduct economic assessment study evaluating a variety of F-gas emission reduction strategies

Evaluations of Strategy

- Environmental analysis
- Economic analysis
- Public health impacts

Next Steps

June 12, 2015	Comments on Concept Paper and Strategy development
Summer 2015	• Release initial draft of Strategy • Public workshops on draft report
Fall 2015	Release draft proposed Strategy
Fall 2015	Present draft proposed Strategy to Board
Spring 2016	Present final Strategy to Board for approval

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