Presentation Outline

- Integrated Strategy for Multiple Goals
- Strategy Development
- Strategic Vision for Mobile Sources
- SIP Measure Concepts
California’s Air Quality and Climate Goals

2023/2030/2031

- Federal Air Quality Standards
- Greenhouse Gas Reduction Targets
- Renewable Energy Targets
- Minimize Near-Source Health Risk
- Petroleum Reduction Target
Mobile Source Reductions Key to Meeting Goals

- Largest contributor to smog-forming, greenhouse gas, and diesel PM emissions
  - 80 percent of ozone-forming NOx
  - 50 percent of greenhouse gases
  - 95 percent of diesel PM

- Will require combination of cleaner technologies, fuels, and energy sources
Importance of Integrated Planning

• Consider how actions can best meet multiple goals
• Assess scope and timing of needed change
• Identify interactions between measures
• Maximize program effectiveness
Supports Multiple Planning Efforts

• Strategy provides framework for ongoing planning efforts:
  – State Implementation Plans
  – Scoping Plan Update
  – California Sustainable Freight Action Plan
  – Short Lived Climate Pollutant Plan
Meets Multiple Goals

**Benefits of Mobile Source Strategy**

<table>
<thead>
<tr>
<th>Smog Forming Emissions</th>
<th>GHG Emissions</th>
<th>Petroleum Usage</th>
<th>Diesel PM Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coast</td>
<td>Statewide</td>
<td>Statewide</td>
<td>South Coast</td>
</tr>
<tr>
<td>80%</td>
<td>45%</td>
<td>50%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Percent reduction by 2030/2031 from today
• SIP development is next planning effort: regional attainment plans due in 2016

• South Coast ozone defines emission reduction needs for attainment deadlines - 2023 & 2031

• Coordination with South Coast on development of mobile source SIP measures

• Meeting PM2.5 standards in the San Joaquin Valley also a key challenge
South Coast Attainment Needs

- Current programs achieve two thirds of needed NOx reductions
- Further efforts will need to address all mobile sectors
- Reduction targets represent equal share from mobile sector
Strategy Development
Building Blocks of Planning Process

• Current programs provide blueprint for successful strategies
• Technology assessments identify status of advanced technologies and fuels
• Scenario analysis provides framework for coordinated air quality and climate assessment
Blueprint for Successful Strategies

• Portfolio approach includes:
  – Engine standards for new vehicles
  – Durability and inspection requirements
  – Sales requirements for advanced technologies
  – Pilot and demonstration projects
  – Incentive programs

• Requires action at State, local, and federal level
• Comprehensive review conducted by ARB, South Coast, US EPA

• Assessments identify:
  – Technology performance
  – Necessary fuels
  – Market readiness
  – Cost
  – Current deployment challenges
Scenario Analysis

- Uses ARB’s Vision model built from official inventories
- Assesses interplay between pollutants and strategies
- Identifies scope and timing of needed deployment of technologies, fuels, and efficiency measures
- Vision 2.0 Model available online
Strategic Vision for Mobile Sources
Transformation of Passenger Fleet

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZEV / PHEV Population</td>
<td>100,000</td>
<td>4,300,000</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>27%</td>
<td>50%</td>
</tr>
<tr>
<td>Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Efficiency</td>
<td>24 mpg</td>
<td>52 mpg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Transformation of Truck Fleet

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-NOx Truck Population</td>
<td>demos</td>
<td>1 million</td>
</tr>
<tr>
<td>Renewable Fuels</td>
<td>8%</td>
<td>50%</td>
</tr>
<tr>
<td>Fuel Efficiency*</td>
<td>7 mpg</td>
<td>10 mpg</td>
</tr>
</tbody>
</table>

*Fuel efficiency for Class 8 Trucks*
Key Actions to Achieve Transformation

Passenger Fleet:
- Increase PHEV/ZEV sales fraction to 40 percent
- Ensure 50 percent of electricity generated from renewable sources
- Increase stringency of fleet wide emission standards

Truck Fleet:
- Establish low-NOx performance standard 90 percent cleaner than today
- Expand share of renewable fuels to 50 percent
- Introduce ZEVs into targeted applications
Reduced growth rates in vehicle miles travelled

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger vehicle fleet</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>Heavy duty vehicle fleet</td>
<td>16%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Increased freight system efficiencies and intelligent transportation systems
Transformation of Off-Road Sector

• Similar scope of transformation is needed
• Technology is not as far along
• Success in on-road technologies will transfer to the off-road sector
SIP Measure Concepts
Measure Concept Development

- Clean Air Act requires specific actions and identified emission reductions
- ARB staff worked closely with South Coast on initial measure concepts
- South Coast will identify local mechanisms to achieve further mobile source reductions
- Measure concepts outline actions to achieve all needed reductions
Proposed Measure Concepts: Passenger Vehicles

- Expand Advanced Clean Cars requirements
- Assessments to ensure durability of passenger vehicle technologies
- Incentivize deployment of cleanest technology
• Establish low-NOx engine standard and ensure durability

• Need for US EPA action in parallel with California; implementation no later than 2024

• Establish requirements for introduction of ZEVs in targeted applications such as transit and shuttle buses

• Incentivize deployment of cleanest technology
Proposed Measure Concepts: Off-Road Equipment

• Establish requirements for ZEV technologies in:
  – Forklifts
  – Transport refrigeration units
  – Airport ground support equipment

• Develop new engine standards and increase penetration of electric lawn and garden equipment

• Incentivize deployment of cleanest technology
• Develop more stringent standards for ships, locomotives, and aircraft
• Federal authority required for ARB to regulate non-new locomotives
• Federal and international action is critical
Proposed Measure Concepts: Efficiencies and Fuels

• Account for benefits of passenger and freight system efficiencies
• Assess worksite efficiency technologies and automation
• Expand requirements for alternative diesel fuels
• Current programs provide over 60 percent of needed reductions
• Measure concepts map pathway for remaining reductions
• Incentives critical to accelerate penetration of cleanest technologies
• Ensure 2023 investments and technologies benefit 2031
Keys to Effective Implementation

- Identify funding needs and mechanisms
- Develop partnerships
- Increase consumer acceptance
- Establish necessary infrastructure
- Ensure availability of renewable fuels and energy sources
Next Steps for SIP Development

- Solicit Board and public input
- Continue work with South Coast and San Joaquin Valley
- Develop concepts into SIP measures
  - Implementation mechanisms
  - Inventory growth assumptions
  - Funding needs and sources
- Conduct environmental and economic analyses
• Consider regional SIPs in 2016 along with final SIP measures
• Expand on elements of mobile source strategy in related planning efforts
  – Scoping Plan Update
  – Sustainable Freight Action Plan
  – Short-Lived Climate Plan