Climate Change
Draft Scoping Plan:
Public Health Benefits

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Linda Murchison, Chief
Planning and Technical Support Division
AB32 requires the ARB to assess environmental and public health benefits of the Scoping Plan

Focused on air quality improvements and resulting public health benefits
Other Environmental Analyses

- CEQA document to released with Proposed Scoping Plan
- Additional analysis during development of regulations, including market-based compliance mechanisms
Key Findings

• Scoping Plan measures will significantly reduce air pollution related premature deaths

• In 2020:
  – 320 fewer premature deaths statewide
  – 160 fewer in the South Coast Air Basin
  – 11 fewer in the Wilmington area
Other Health Benefits

- Fewer hospital admissions for heart and lung conditions
- Fewer cases of acute bronchitis, asthma, and respiratory symptoms
- Fewer work loss and restricted activity days
- Positive lifestyle changes with land use changes
Analysis Approach

- Statewide impacts
- Region with significant exposure to air pollutants – South Coast Air Basin
- Local community – Wilmington area
Analysis Steps

- AQ improvements from existing program
- Statewide GHG reductions
- Corresponding criteria pollutant reductions
- Apportion to regions by criteria pollutant levels
- Apply State and region-specific health impact correlations
GHG Reduction Estimates

• Transportation:
  – Avoided fuel combustion
  – Electrification
  – Avoided upstream emissions

• Electricity and Natural Gas:
  – Avoided electricity generation, natural gas combustion
  – Replacement with zero-emission sources

• Industry:
  – Avoided fuel combustion
Health Effects Methodology

- Developed and used by U.S. EPA
- Endorsed by health organizations
- Used to assess ambient air quality standards, diesel PM control measures and Goods Movement Plan
- Includes California-specific health studies
- Peer reviewed
Health Methodology Overview

Baseline Incidence Rates & Response Functions

Total Exposure

Emissions Estimates

Air Quality Data

Health Impacts

Health Methodology Overview
Health Endpoints

• Premature death
• Hospital admissions: respiratory
• Hospital admissions: cardiovascular
• Acute bronchitis
• Asthma/other respiratory symptoms
• Work loss days
• Minor restricted activity days
State Level Impacts

• Greatest reductions come from:
  – energy efficiency and conservation,
  – goods movement efficiency, and
  – the renewable portfolio standard

• 56 tpd NOx, 12 tpd PM2.5 reduced in 2020
## Statewide Health Benefits

### Health Endpoint

<table>
<thead>
<tr>
<th>Health Endpoint</th>
<th>Existing and 2007 SIP</th>
<th>Scoping Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature deaths</td>
<td>3,700</td>
<td>320</td>
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<tr>
<td>Hospital admissions respiratory</td>
<td>770</td>
<td>67</td>
</tr>
<tr>
<td>Hospital admissions cardiovascular</td>
<td>1,400</td>
<td>120</td>
</tr>
<tr>
<td>Asthma/respiratory symptoms</td>
<td>110,000</td>
<td>8,800</td>
</tr>
<tr>
<td>Acute bronchitis</td>
<td>8,700</td>
<td>730</td>
</tr>
<tr>
<td>Work loss days</td>
<td>620,000</td>
<td>53,000</td>
</tr>
<tr>
<td>Restricted activity days</td>
<td>3,600,000</td>
<td>310,000</td>
</tr>
</tbody>
</table>

Mean number of cases avoided in 2020; uncertainty intervals range within 20-70 percent of the mean benefit.
Regional Level Analysis

- South Coast Air Basin example
- Stationary source reductions reflect basin’s share of existing statewide emissions at sector/process level
- On-road mobile reductions apportioned by VMT
- Scoping Plan provides additional health benefits over existing program and 2007 SIP
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</thead>
<tbody>
<tr>
<td>Premature deaths</td>
<td>2,500</td>
<td>160</td>
</tr>
<tr>
<td>Hospital admissions respiratory</td>
<td>530</td>
<td>33</td>
</tr>
<tr>
<td>Hospital admissions cardiovascular</td>
<td>980</td>
<td>62</td>
</tr>
<tr>
<td>Asthma/respiratory symptoms</td>
<td>74,000</td>
<td>4,700</td>
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<tr>
<td>Acute bronchitis</td>
<td>6,100</td>
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<tr>
<td>Work loss days</td>
<td>440,000</td>
<td>28,000</td>
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<tr>
<td>Restricted activity days</td>
<td>2,500,000</td>
<td>160,000</td>
</tr>
</tbody>
</table>

Mean number of cases avoided in 2020; uncertainty intervals range within 20-70 percent of the mean benefit.
Community Level Analysis

- Wilmington community (12×12 Km area)
- Located in the South Coast Air Basin
- Close proximity to ports, rail, and other sources
Community Level Sources

Stationary Sources
- Electrical utilities
- Oil and gas production
- Oil refining
- Industrial boilers and internal combustion engines

Mobile Sources
- Cars and trucks
- Trains
- Ships
- Off-road equipment

Other
- Residential & commercial fuel combustion
Analysis at the Local Level

- Gridded modeling inventory used to reflect local sources and vehicle emissions
- Percent statewide emission reductions applied to local source emissions or throughput by source category
Community Level Impacts

- Scoping Plan reduces 2020 emissions
- Scoping Plan reductions $\approx 11$ avoided premature deaths in study area
- Most health benefits will occur outside of the study area
Conclusions

• Draft Scoping Plan will provide new air pollution and health benefits
• In addition to significant improvements in air quality from existing control program
• Additional analyses will be conducted during measure development