Climate Change
Draft Scoping Plan:
Public Health Benefits

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Scoping Plan Health Benefits

• 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

- Air Quality Data
- Emissions Estimates

Total Exposure

Baseline Incidence Rates & Response Functions

Health Impacts
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

<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>
</tr>
<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
## South Coast Health Benefits

<table>
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<th>Health Endpoint</th>
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<th>Scoping Plan</th>
</tr>
</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>
</tr>
<tr>
<td>Acute bronchitis</td>
<td>6,100</td>
<td>390</td>
</tr>
<tr>
<td>Work loss days</td>
<td>440,000</td>
<td>28,000</td>
</tr>
<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 ≈ 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