Public Workshop
2017 Scoping Plan Update
The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target

October 12, 2017
Sacramento, California
Workshop Materials

Slides

https://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm
Outline

- Background and Process
- Recent Legislation
- Scoping Plan Analyses
- GHG and Air Quality Analyses
- Economic Refinements
- Schedule
Background and Process
Scoping Plan Background

- First Scoping Plan required by Assembly Bill 32
  - Must be updated at least every 5 years
- Initial Scoping Plan (2008) and First Update (2014)
- Executive Order B-30-15
  - Establishes GHG emissions reduction target of 40% below 1990 levels by 2030
  - Directs CARB to update Scoping Plan to incorporate 2030 GHG target
- Senate Bill 32 codifies 2030 GHG target
- AB 398 directs CARB to update Scoping Plan no later than January 1, 2018
2017 Scoping Plan Update Process

- Coordination with State agencies and Legislature since 2015
- Presentations at 5 Board Hearings
- Over 15 Public Workshops
- Over 19 Environmental Justice Advisory Committee (EJAC) Meetings and 19 EJAC Community Meetings
- Over 500 public comments received and reviewed
2017 Scoping Plan Update Objectives

- Achieve 2030 target
- Provide direct GHG emissions reductions
- Provide air quality co-benefits
- Protect public health
- Minimize emissions “leakage” – increase to non-CA GHG emissions
- Support climate investment in disadvantaged communities
- Facilitate sub-national and national collaboration
- Support cost-effective and flexible compliance
- Support Clean Power Plan and other federal action
Alternatives Considered

- No Cap-and-Trade (Prescriptive Regulations)
- Carbon Tax
- All Cap-and-Trade
- Cap and Tax
Reference for Updates

- January 2017 Draft Scoping Plan
  https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

- March Workshop Analyses
  https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf
Recent Legislation Since January 2017 Draft Scoping Plan
Recent Legislation

- July 17, 2017 Legislature passed AB 398 and AB 617
  - AB 398 provides direction on a post-2020 Cap-and-Trade Program and updates to the recent Scoping Plan Update
  - AB 617 focuses on reducing exposure to criteria and toxic pollutants in California’s most burdened communities

- Initiate a new rulemaking to design a post-2020 program that conforms to the requirements in AB 398
- Work underway to implement new community-focused air quality program including monitoring and emission reduction plans
Scoping Plan Scenario

- *SB 350 - increase renewable energy and energy efficiency*
- *SB 1383 - Short-Lived Climate Pollutant Plan*
- *Mobile Source Strategy - help State achieve its federal and state air quality standards*
- *Enhanced Low Carbon Fuel Standard*
- *Sustainable Freight Action Plan*
- *SB 375 – support sustainable community development*
- Post-2020 Cap-and-Trade Program

*Existing commitments*
SB 375 GHG Reduction Targets

- Targets advance local and regional planning and exploration of land use and transportation strategies
- To meet Scoping Plan goals, more is needed from regions
- Board considering update this November
Scoping Plan Analyses
Emissions Modeling Refinements

- Refinery measure removed

- Modeling updates
  - Electricity sector updates
    - Updates to reflect RPS compliance
      - Exclusion of pumping loads from retail sales
      - Inclusion of banked REC's
      - Inclusion of out-of-state PCC 3 REC's
  - Other: Motorcycle energy demand, behind-the-meter CHP, refrigeration measure
Scoping Plan - Estimated Cumulative GHG Reductions by Measure (2021-2030)

- 294 Cap-and-Trade Program
- 217 Short Lived Climate Pollutants (High Global Warming Gases & Methane Reduction from LCFS and Direct Measures)
- 64 Mobile Sources CFT & Freight
- 64 Energy Efficiency (Res, Com, Ind Ag & TCU)
- 25 Biofuels (18% LCFS)
- 16 50% RPS
## GHG Emissions by Sector in 2030

<table>
<thead>
<tr>
<th>Estimated GHGs by Sector [MMTCO2e]</th>
<th>1990</th>
<th>2030 Scoping Plan Ranges</th>
<th>% change from 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>26</td>
<td>24–25</td>
<td>-8 to -4</td>
</tr>
<tr>
<td>Residential and Commercial</td>
<td>44</td>
<td>38–40</td>
<td>-14 to -9</td>
</tr>
<tr>
<td>Electric Power</td>
<td>108</td>
<td>30–52</td>
<td>-72 to -52</td>
</tr>
<tr>
<td>High GWP</td>
<td>3</td>
<td>8–11</td>
<td>167 to 267</td>
</tr>
<tr>
<td>Industrial</td>
<td>98</td>
<td>83–88</td>
<td>-15 to -10</td>
</tr>
<tr>
<td>Recycling and Waste</td>
<td>7</td>
<td>8–9</td>
<td>14 to 29**</td>
</tr>
<tr>
<td>Transportation (Including TCU)</td>
<td>152</td>
<td>103–111</td>
<td>-32 to -27</td>
</tr>
<tr>
<td>Net Sink*</td>
<td>-7***</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Sub Total</td>
<td>431</td>
<td>294–336</td>
<td>-32 to -22</td>
</tr>
<tr>
<td>Cap-and-Trade Program</td>
<td>n/a</td>
<td>34–76</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td>431</td>
<td>260</td>
<td>-40</td>
</tr>
</tbody>
</table>
Natural and Working Lands (NWL)

- **Objectives**
  - Net zero or negative GHG emissions and
  - Minimize, where appropriate, net GHG and black carbon emissions

- **Goal**
  - Preliminary intervention-based goal for sequestering and avoiding emissions by at least 15-20 MMTCO$_2$e by 2030 through existing pathways and new incentives

- **NWL Implementation Plan**
  - Set pathway to meet sector objectives and intervention-based goal
  - First workshop on Friday October 13, 2017
  - Ongoing development and feedback in 2018
Appendices

- Additional appendices since January 2017 Draft Scoping Plan
  - Alternatives Evaluation, Estimations for AB 197, and Health Impacts (presented at March 2017 workshop)
  - Major Climate Statutes and Regulations
  - Green Buildings Strategy
GHG and Air Quality Analyses
Scoping Plan: 2030 GHG and Air Quality Reductions

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Range of GHG Reductions (MMTCO2)*</th>
<th>Range of NOx Reductions (Tons/Day)</th>
<th>Range of VOC Reductions (Tons/Day)</th>
<th>Range of PM2.5 Reductions (Tons/Day)</th>
<th>Range of Diesel PM Reductions (Tons/Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping Plan Scenario</td>
<td>100-184</td>
<td>48-73</td>
<td>5.1-7.3</td>
<td>1.4-2.4</td>
<td>5-12</td>
</tr>
</tbody>
</table>

- Mobile Sources measures primary drivers of benefits in air quality
  - Mobile Source Strategy, Sustainable Freight, 18% LCFS
- In 2030, Cap-and-Trade Program estimated to deliver 58-119 MMTCO2e reductions—including in GHG range in table
### Estimated Health Impacts Due to Emissions Reductions in 2030

<table>
<thead>
<tr>
<th></th>
<th>Proposed Scenario (annual reductions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>140-210</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>20-31</td>
</tr>
<tr>
<td>ER Visits</td>
<td>58-88</td>
</tr>
</tbody>
</table>

- Totals include impacts of diesel particulate matter and NOx
- Individual incidents in 2030, does not include cancer risk
- Does not include impacts of Cap-and-Trade
- Estimates only account for emissions uncertainty and not health benefits model uncertainty
- Emissions from power plants are weighted to reflect reduced exposure from tall smoke stack
Additional Information

- Additional details on GHG and air quality reductions, health impacts analyses, and estimating health co-benefits presented at March 28, 2017 workshop:
  - [https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf](https://www.arb.ca.gov/cc/scopingplan/meetings/032817/sp-march-workshop-slides.pdf)
Economic Refinements
Economic Modeling

- Includes capital and fuel costs from PATHWAYS
- Impacts of carbon pricing are calculated outside of PATHWAYS
- Results include monetization of health impacts from changes in emissions of diesel particulate matter and NOx
  - Avoided premature mortality
  - Hospitalizations
  - ER visits
- Results do not include
  - Benefits of active transportation
  - Avoided environmental damages as calculated with the social cost of carbon or the social cost of methane
## Direct Cost Estimates in 2030 Relative to Reference Case (Billion $2015)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2030 Stock Costs (Billion $2015)</th>
<th>2030 Fuel Costs (Billion $2015)</th>
<th>2030 Cost of Reductions due to Carbon Pricing (Billion $2015)</th>
<th>2030 Total Cost (Billion $2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping Plan Scenario</td>
<td>$6.0</td>
<td>-5.9</td>
<td>$1.6 to $5.1</td>
<td>$1.7 to $5.2</td>
</tr>
</tbody>
</table>
### Scoping Plan: 2030

#### Macroeconomic Impacts

<table>
<thead>
<tr>
<th></th>
<th>Absolute Change</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>California GDP (Billion $2015)</td>
<td>-$9.7 to -$19.4</td>
<td>-0.3% to -0.6%</td>
</tr>
<tr>
<td>Employment (Thousand Jobs)</td>
<td>-43.4 to -81.3</td>
<td>-0.2% to -0.3%</td>
</tr>
<tr>
<td>Personal Income (Billion $2015)</td>
<td>-$4.2 to -$1.7</td>
<td>-0.1%</td>
</tr>
</tbody>
</table>

- Relative to Reference scenario in 2030
  - California GDP: $3.4 trillion
  - Employment: 23,500,000
  - Personal Income: $3.0 trillion

- The average growth rate of State GDP, employment, and personal income are unchanged relative to the Reference scenario.
## Estimated Economic Valuation of Avoided Health Impacts Due to Emissions Reductions in 2030

<table>
<thead>
<tr>
<th>(Million $2015)</th>
<th>Scoping Plan Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>$1,200 - $1,810</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>$970 - $1,500</td>
</tr>
<tr>
<td>ER Visits</td>
<td>$0.04 - $0.065</td>
</tr>
<tr>
<td>Total</td>
<td>$1,210 - 1,810</td>
</tr>
</tbody>
</table>

- Economic Valuation includes avoided health impacts related to reductions in diesel particulate matter and NOx relative to the reference case.
- Does not include carbon related disease health impacts included in the Social Cost of Carbon.
- Does not include any potential benefit associated with active transportation.
Regional Impact Methodology

- Disaggregate State-wide impacts to California counties
  - REMI California County model

- Estimate relative economic impact of scenarios to DACs
  - DACs identified using CalEnviroScreen 2.0
  - County employment information from American Community Survey (ACS) provides census-tract level estimates of jobs by occupation
Schedule

- November 2017: Full Final Scoping Plan
- EJAC meeting(s)
- December 14/15, 2017: Final Board consideration
Additional Information

- Scoping Plan
  http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm
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