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
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 RECs
      - Inclusion of out-of-state PCC3 RECs
  - 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 II-3. Estimated Change in GHG Emissions by Sector

<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(^{68})</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><strong>Sub Total</strong></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><strong>Total</strong></td>
<td>431</td>
<td>260</td>
<td><strong>-40</strong></td>
</tr>
</tbody>
</table>
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 MMTCO₂e 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</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—included 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</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](http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm)
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