Public Workshop
2017 Scoping Plan Update

The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target

CALIFORNIA AIR RESOURCES BOARD

October 12, 2017
Sacramento, California

Workshop Materials

Slides

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

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Outline

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

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Background and Process

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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

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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

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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

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Alternatives Considered

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

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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

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Recent Legislation Since January 2017 Draft Scoping Plan

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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

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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

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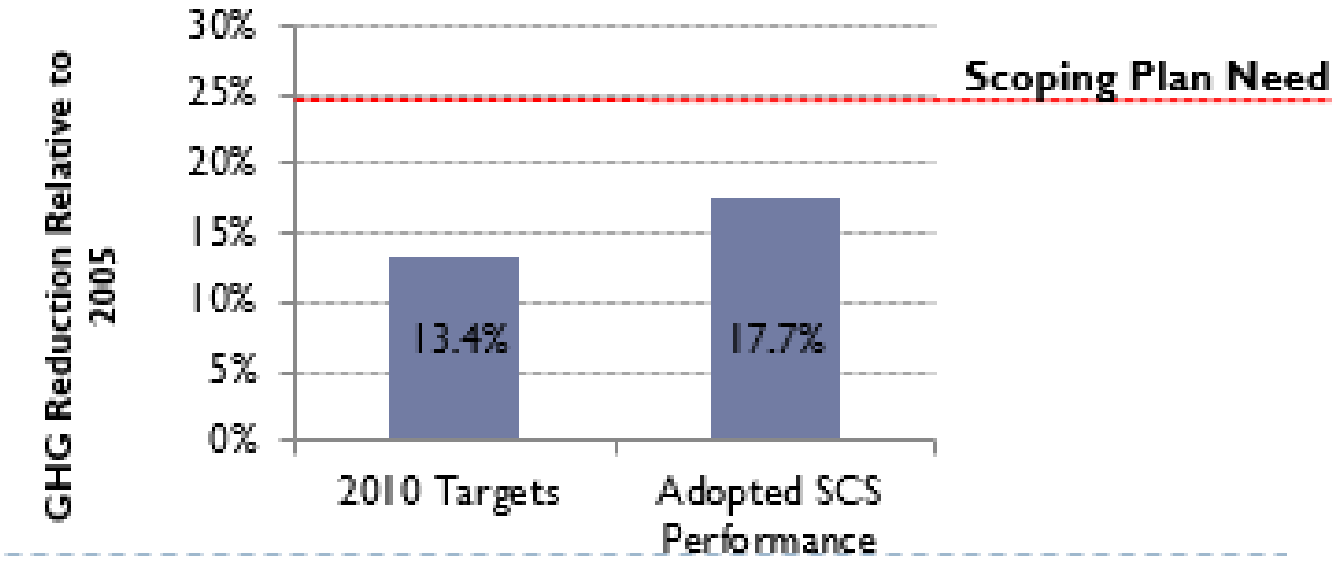
SB 375 GHG Reduction Targets

- 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



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Scoping Plan Analyses

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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

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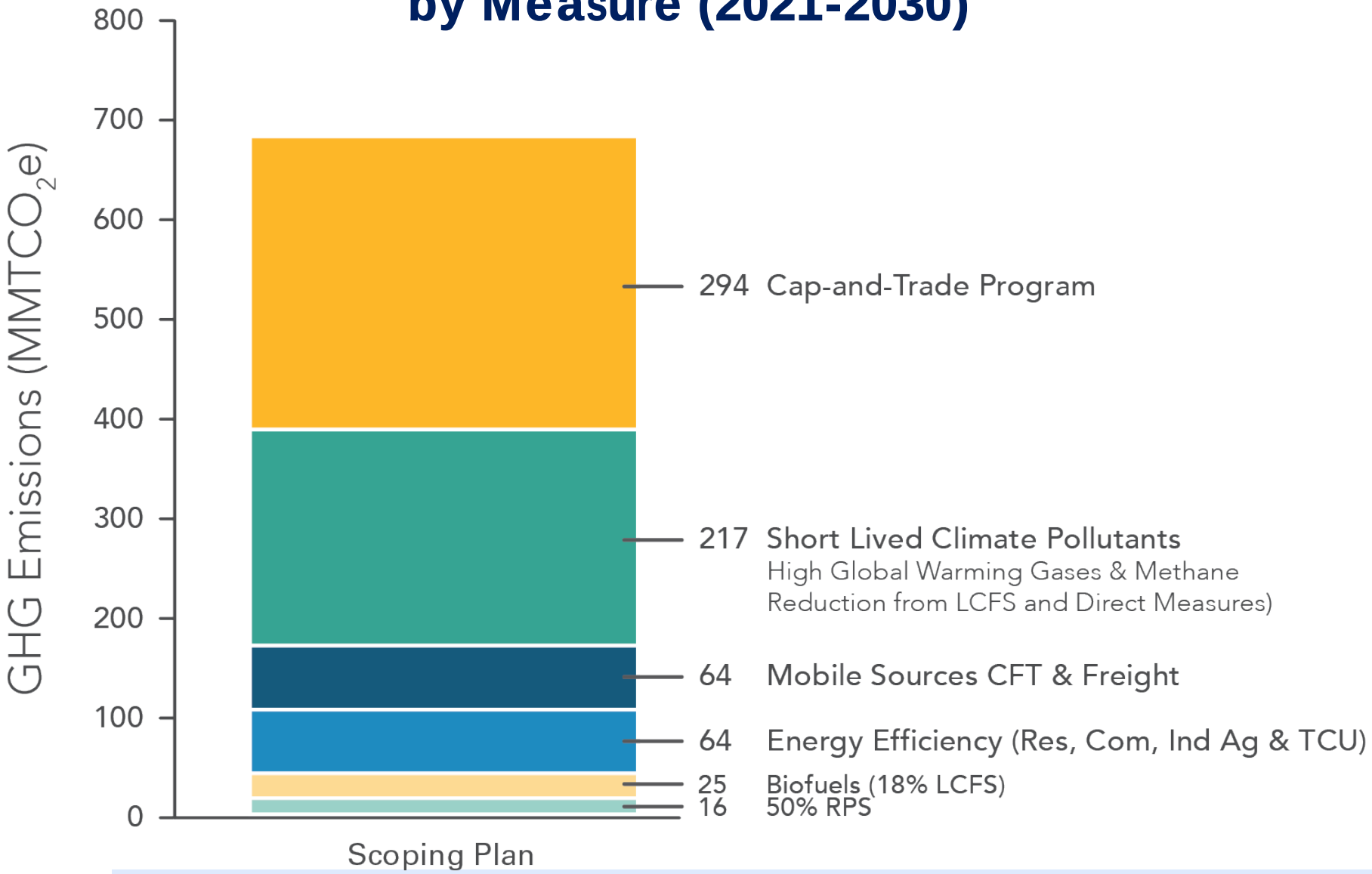
Scoping Plan – Estimated Cumulative GHG Reductions by Measure (2021-2030)



GHG Emissions by Sector in 2030

Table II-3. Estimated Change in GHG Emissions by Sector

Estimated GHGs by Sector [MMTCO2e]			
	1990	2030 Scoping Plan Ranges	% change from 1990
Agriculture	26	24–25	-8 to -4
Residential and Commercial	44	38–40	-14 to -9
Electric Power	108	30–52[68]	-72 to -52
High GWP	3	8–11	167 to 267
Industrial	98	83–88	-15 to -10
Recycling and Waste	7	8–9	14 to 29**
Transportation (Including TCU)	152	103–111	-32 to -27
Net Sink*	-7***	TBD	TBD
Sub Total	**431**	**294–336**	**-32 to -22**
Cap-and-Trade Program	n/a	34–76	n/a
Total	**431**	**260**	**-40**

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 MMT CO_2e 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

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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

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GHG and Air Quality Analyses

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Scoping Plan: 2030 GHG and Air Quality Reductions

Scenario	Range of GHG Reductions (MMTCO2)*	Range of NOx Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM2.5 Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
Scoping Plan Scenario	100-184	48-73	5.1-7.3	1.4-2.4	5-12

- 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

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Estimated Health Impacts Due to Emissions Reductions in 2030

	Proposed Scenario *(annual reductions)*
Mortality	140-210
Hospitalizations	20-31
ER Visits	58-88

- 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

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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

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Economic Refinements

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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

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Direct Cost Estimates in 2030 Relative to Reference Case (Billion $2015)

Scenario	2030 Stock Costs (Billion $2015)	2030 Fuel Costs (Billion $2015)	2030 Cost of Reductions due to Carbon Pricing (Billion $2015)	2030 Total Cost (Billion $2015)
Scoping Plan Scenario	$6.0	-5.9	$1.6 to $5.1	$1.7 to $5.2

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Scoping Plan: 2030 Macroeconomic Impacts

	Absolute Change	Percentage Change
California GDP (Billion $2015)	-$9.7 to -$19.4	-0.3% to -0.6%
Employment (Thousand Jobs)	-43.4 to -81.3	-0.2% to -0.3%
Personal Income (Billion $2015)	-$4.2 to -$1.7	-0.1%

- 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 personal income are unchanged relative to the Reference scenario

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Estimated Economic Valuation of Avoided Health Impacts Due to Emissions Reductions in 2030

(Million $2015)	Scoping Plan Scenario
Mortality	$1,200 - $1,810
Hospitalizations	$970 - $ 1,500
ER Visits	$0.04 - $0.065
Total	$1,210 – 1,810

- 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

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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

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Schedule

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

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Additional Information

- Scoping Plan

http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

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