Overview of the Development of the 2022 Scoping Plan Update

FEBRUARY 2022
AB 32 Scoping Plan(s)

- Planning phase (underway now) – framework for achieving targets and goals
- Implementation phase – transform plan to action via action on regulations, programs, incentives, etc.
- Both critical to success
2022 Scoping Plan Update: Key Objectives

- **2022**: Late 2022, Board consideration of 2022 Scoping Plan
- **SB 32**: Assess progress towards achieving the 2030 target
- **Science**: Lay out a path for achieving carbon neutrality no later than 2045
2022 Scoping Plan Update: Key Objectives, cont.

- **Longest planning horizon of any Scoping Plan**: >20 yr
- **Identify endpoints for transition that support near term air quality benefits & long term GHG benefits**: Outcomes
- **Technology and fuel deployment paths**: Metrics
AB 32 & Scoping Plan Greenhouse Gases

- Greenhouse Gases included in statute: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur hexafluoride (SF₆), Nitrogen trifluoride* (NF₃)

- Focus on sources or categories of sources that contribute the most to statewide emissions

- AB 32 GHG Inventory includes all direct sources of emissions in the State and emissions associated with electricity consumed in-state

- AB 32 and SB 32 targets include all sources in the AB 32 GHG Inventory
California’s Trends

AB 32 INVENTORY SOURCES

Annual Statewide GHG Emissions

2020 Target = 431

CA GHG Reduction Targets

Achieving Carbon Neutrality by 2045
AB 32 Climate Change Scoping Plan Statutory Requirements

- Scoping Plan(s) are action plans for CA to meet statewide GHG reduction targets
  - Scoping Plan(s) outline a suite of climate policies to address emissions across all sectors
  - Required to be updated at least every 5 years
  - 2017 SP (most recent) – cost-effective and technologically feasible path to achieve the 2030 target

- Provide direct GHG emissions reductions and air quality benefits

- Minimize emissions “leakage” – increase to non-CA GHG emissions
  - Ensure high-road jobs remain

- Facilitate sub-national and national collaboration
  - Develop exportable programs for partners to adopt

- Support cost-effective and flexible compliance
California’s Climate Policy Framework

- **GHG Targets and Goals**
  - Legislation and Executive Orders: total GHGs (AB 32/SB 32) or sector targets (SB 1383/SB 100), etc.

- **AB 32 Scoping Plan**
  - Actionable plan across all sectors

- **Action**
  - Regulations & Incentives: Advanced Clean Cars, Climate change investments, etc.

- **Projects**
  - Examples: building compost facilities, digesters, renewables, energy infrastructure, etc.
Climate Legislative and EO Direction for the 2022 Scoping Plan Update (1 of 3)

Scope of sources and gases

Do not exacerbate harm to disproportionately impacted communities nor interfere with ambient air efforts

Technologically feasible and cost effective

Minimize leakage

Focus on largest sources of emissions

**AB 32**

**SB 32** – Reduce GHGs at least 40% below 1990 levels by 2030

**S-03-05** – Reduce GHGs 80% below 1990 levels by 2050

**B-55-18** – Achieve carbon neutrality no later than 2045

**AB 197** – Prioritize direct reductions; include GHG $/ton of action, air pollution reductions, social cost of carbon
Climate Legislative and EO Direction for the 2022 Scoping Plan Update (2 of 3)

- **Reduce SLCPs**
  - **SB 1383** – Reduce methane and HFCs 40% below 2013 levels by 2030
  - Implement SLCP Strategy – dairy manure management and enteric strategies

- **Decarbonize Electricity**
  - **SB 100** – 60% renewables by 2030 and 100% zero-carbon retail sales by 2045

- **Reduce Petroleum Use in Vehicles**
  - **N-79-20** – 100% sales of LDVs are ZEVs by 2035 and by 2045 for MD/HD trucks
  - **SB 375** – GHG targets for sustainable transportation to reduce emissions from driving

- **Reduce Industrial Emissions**
  - **AB 398** – Legislative designed Cap-and-Trade Program through 2030
  - **SB 596** – Net-zero GHGs from cement by 2045
Incorporate NWL into State’s climate goals

- SB 1386 – State agencies shall consider the conservation and management of NWL in meeting GHG emission reduction goals
- N-82-20 – Goal of protecting 30% of California’s lands and waters by 2030, and updating the target for the NWL sector in the 2022 Scoping Plan

Carbon dioxide removal targets

- SB 27 – Establish NWL Climate Smart Strategy and CO₂ removal targets for 2030 and beyond
- AB 1504 – Ensure rules governing commercial forest harvesting consider the annual sequestration target of 5 MMTCO₂e established in the 2008 Scoping Plan, in addition to other ecosystem co-benefits
State Multi-Agency Effort

List is not exhaustive
What Carbon Neutrality Means

Continue to reduce emissions from sources in the AB 32 GHG Inventory

Emissions and sequestration from natural and working lands

Technological Carbon Dioxide Removal

= Carbon Neutral
Progress to Date

- 11 Public Workshops with Interagency Coordination
- More than 400 written public comments from individuals, environmental justice organizations, industry groups, and others
- Numerous stakeholder meetings, including 2 Tribal-specific webinars
- 13 Environmental Justice Advisory Committee Meetings
- 1 Board Meeting Informational Update
AB 32 Sources Modeling Scenarios

- All scenarios must at least:
  - be consistent with existing Legislative Mandates and Executive Orders
  - meet GHG goals
  - work in concert with existing and emerging air quality programs
  - deliver near-term air quality benefits, especially in heavily burdened communities

- By summer 2022, staff will propose a scenario to the Board based on:
  - Consistency with statutes and EOs
  - Consideration of public, EJ Advisory Committee, and public agency input
  - A balance of several factors including benefits, costs, leakage minimization, technological feasibility, direct emissions reductions in accordance with key statutes
Tools for AB 32 Sources Scenario Analyses

- **California economy-wide scenarios**
  - Energy+Environmental Economics
  - **PATHWAYS model**: California economy-wide energy and greenhouse gas scenarios

- **Air Quality and Health Impacts**
  - SMOKE + CMAQ air quality models + **BenMAP model** for health impacts

- **Economic Analysis**
  - IMPLAN macroeconomic modeling

Scoping Plan Model Granularity

All fuel and energy changes are at the state level for all economic sectors

Translated into state-level drop in emissions and applied equally to CARB inventory sources

Models translate emissions drop to ambient pollutant improvement and avoided health impacts
Expanded Health Analyses for the 2022 Scoping Plan

- Quantitative outcomes
  - Reduced cases of mortality and morbidity

- Qualitative outcomes
  - Directional and scale of effects
  - Broader set of health outcomes
  - Health disparities

- Status quo versus action
## Overview: Key Health Analysis Elements

<table>
<thead>
<tr>
<th>Analysis Type</th>
<th>2017 SP</th>
<th>2022 SP</th>
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<tbody>
<tr>
<td>Quantitative Analysis</td>
<td># cases and value statewide PM</td>
<td># cases and value state and local PM and Ozone</td>
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<tr>
<td>Health Overview</td>
<td>Literature review</td>
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<tr>
<td>Qualitative Analysis</td>
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<td>Health Endpoints</td>
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<td>Proposing 11</td>
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<td># of cases; Date of estimate TBD</td>
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<td>Wildfire Analysis</td>
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<td># cases and value for selected years</td>
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<tr>
<td>Heat Mortality Analysis</td>
<td>Not included</td>
<td>Under review</td>
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AB 32 Sources Scenarios Overview

2035

Alternative 1: Nearly complete phaseout of combustion, limited reliance on engineered carbon removal, restricted applications for biomass derived fuels

2035

Alternative 2: Use full suite of technology options, including engineered carbon removal

2045

Alternative 3: Use a broad portfolio of existing and emerging fossil fuel alternatives and alignment with statutes and Executive Orders

2045

Alternative 4: Use existing and emerging technologies, slower rate of clean technology and fuel deployment and consumer adoption
AB 32 Sources Scenarios Comparison

SIMILARITIES

- Drastic reductions in fossil fuel dependence, but some demand remains
- Ambitious deployment of efficient and non-combustion technologies
- Ambitious production and distribution of clean energy
- Managed phasedown of fossil fuel as transitioning to clean energy
- No scenario eliminates all emissions from AB 32 sources, SLCPs remain
- Carbon dioxide removal of residual emissions

DIFFERENCES

- Speed of transition to carbon neutrality goal
- Amount of fossil fuel remaining by end of scenario
- Constraints on technology and fuels deployed in certain sectors

*Detailed PATHWAYS modeling assumptions available at: https://ww2.arb.ca.gov/sites/default/files/2021-12/Revised_2022SP_ScenarioAssumptions_15Dec.pdf*
NWL Scoping Plan History

- 2008 Scoping Plan
  - Forests only
  - 5MMT sequestration by 2030

- 2013 Scoping Plan
  - Natural and Working Lands
  - Forest Carbon Plan

- 2017 Scoping Plan
  - Reduce NWL emissions 15-20 MMT
  - NWL Climate Change Implementation Plan
Designing NWL Scenarios

- Scenarios explore different visions for how California lands can be managed into the future, with an eye toward 2045 and beyond
- Scenarios set objectives and management strategies to reach those objectives
  - Each NWL type, ownership, and region have varying levels of management
- Developed in response to public comment, stakeholder outreach, and through state and federal government collaboration
- Factors to be weighed in staff proposed scenario for CARB Board consideration:
  - Identify trade-offs for balancing several factors including: ecosystem co-benefits, economic costs, technical feasibility
Tools for NWL Scenario Analysis

Model Projections of Ecological Impacts

Portfolio of NWL models for carbon and other ecological outcomes from management:

- **Forests, Shrublands, Grasslands**: Regional Hydrological and Ecological Simulation System (RHESSys)
- **Agriculture**: Daycent, CARB derived model
- **Settlements**: CARB derived model, Defensible Space model
- **Wetlands**: CARB derived model
- **Deserts and Other Lands**: CARB derived model

Human Health Impacts

- Projected Forest, Shrubland, and Grassland Wildfire emissions + BenMAP model for health impacts

Economic Analysis

- Cost estimates of management strategies, and health impacts
NWL Models

- Models project carbon stock and flux change over time
  - Under climate change
  - With different management practices based on NWL scenarios
- Additional ecological outcomes (e.g., wildfire activity, water dynamics) depending on NWL category

<table>
<thead>
<tr>
<th>NWL Categories</th>
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<tbody>
<tr>
<td>Forests</td>
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<tr>
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<td>Settlements</td>
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<td>Deserts and other lands</td>
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CALIFORNIA AIR RESOURCES BOARD
Natural and Working Lands Carbon Alternatives

NWL Alternative 1: Prioritize maximizing short term carbon stock at 2045

NWL Alternative 2: Balanced mix of strategies from current commitments/plans

NWL Alternative 3: Prioritize restoration and climate resilience

NWL Alternative 4: Prioritize forest wildfire and other fuel reduction efforts
Next Steps – Prior to Release of the Draft 2022 Scoping Plan Update

**Workshops**
- Modeling results workshops (March/April)
- Transportation sector workshop (March)

**Board Engagement**
- 2 Board informational updates (Feb., March)
- Board-EJAC meeting (March)
- 1st Board meeting (June)

**Environmental Justice Advisory Committee**
- 2 standing meetings per month
- Topical Workgroup meetings as needed

**Community Meetings**
- EJAC-led community meetings with CARB staff assistance