

# Draft 2022 Scoping Plan

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JUNE 23, 2022



# Today's Informational Update

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- Continues engagement with the Board and stakeholders on yearlong development of the Draft 2022 Scoping Plan
- Opportunity for Board to hear from staff on analysis and recommendations in draft 2022 Scoping Plan
- Opportunity for Board to ask questions of staff, hear from the public and provide direction
- Next steps:
  - Staff will implement modifications to the Proposed Scenario based on Board direction
  - Continued public workshops, EJ Advisory Committee meetings and community listening sessions
  - Joint CARB/EJ Advisory Committee Meeting in September
  - Publish final Scoping Plan in Fall 2022 and return to Board for a vote before the end of 2022

# AB 32 Climate Change Scoping Plan Statutory Requirements

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- 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

# Overview of the Draft 2022 Scoping Plan

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## *Unprecedented Deployment of Clean Technology*



30x total on-road ZEVs



6x electric appliances in residences



60x hydrogen supply



4x installed wind/solar generation capacity

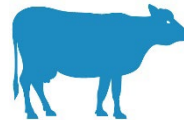
## *Significant GHG Reductions*



91% decrease in petroleum demand



91% decrease in fossil natural gas used in buildings



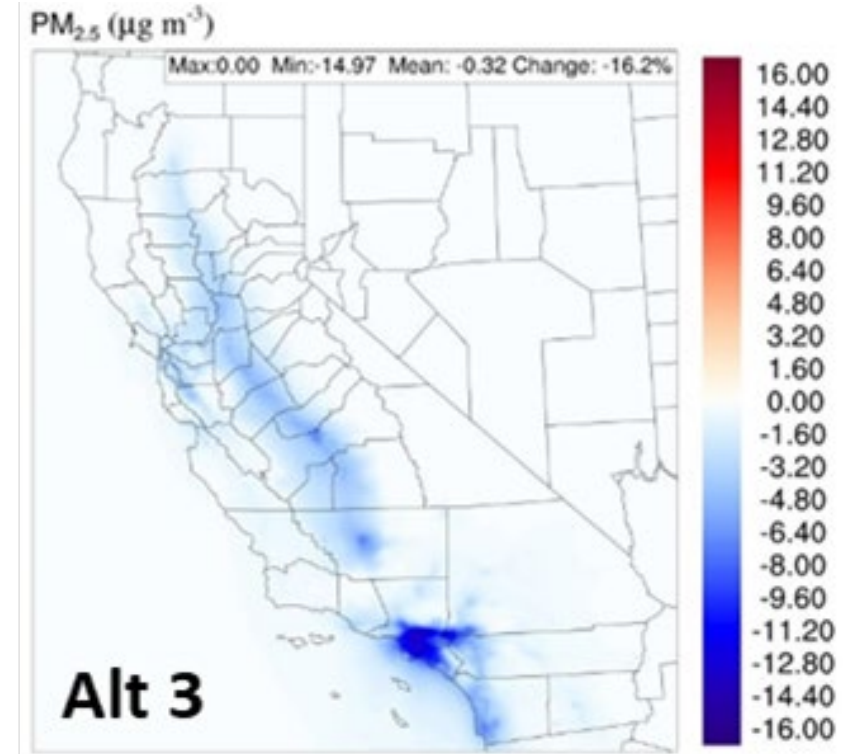
66% decrease in methane emissions from agriculture

In 2045 relative to 2022

# Significant Air Quality Benefits

## *New atmospheric and transport modeling*

- 60% reduction in NO<sub>x</sub> in January and July
- 25% fewer exceedance days for PM<sub>2.5</sub> standard (35 µg/m<sup>3</sup>) in January
- 12.5% fewer exceedance days for ozone standard (70 ppb) in July
- 17 health end points evaluated
  - 4 evaluated in 2017 Scoping Plan Update



Difference in 24-hour average PM<sub>2.5</sub> (ug/m<sup>3</sup>) in January 2045 in the Proposed Scenario (Alt 3) relative to the Reference Scenario

State-wide reductions relative to 2045 Reference

# Significant Public Health Benefits

New robust public health analysis evaluates benefits of community resiliency

## Benefits of VMT reduction and reduced wildfire smoke

- ↓ VMT, ↑ Walking, biking and active transport\* (almost 8000 avoided deaths from chronic illness)
- ↓ Wildfire smoke from NWL scenarios (hundreds of avoided deaths, ER visits, and hospitalizations)

## Overall Directional Benefits

- ↓ Mortality, ER visits, asthma, cardiovascular and respiratory disease, cancers, mental illness, infectious diseases, diabetes, and adverse birth outcomes
- ↑ Children's overall physical, respiratory, and mental health and cognition
- ↑ Health status and life expectancy

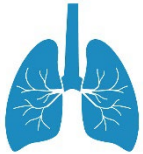
\*Illustrative scenario based on California Transportation Plan 2050

# Health and Economic Metrics

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Social cost of carbon (avoided economic damages) of **\$9.9 billion** in 2045



Health benefits (avoided incidence of health effects) over **\$10 billion**  
2045 episodic modeling



**9x** less impact on state economy than most aggressive alternative in 2045  
**7x** less impact on household income than most aggressive alternative in 2045  
**2x** less direct costs than most aggressive alternative in 2045



**1.5x** less impact on jobs than most aggressive alternative in 2045

\*Reference economy and jobs indicate continued growth from now through 2045

# Metrics for NWL

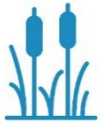
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10x increase in forest management



5x increase in climate smart agricultural practices



50% reduction in conversion of sparsely vegetated lands to another land use



10% decrease in annual wildfire emissions



20% increase in urban forest investment

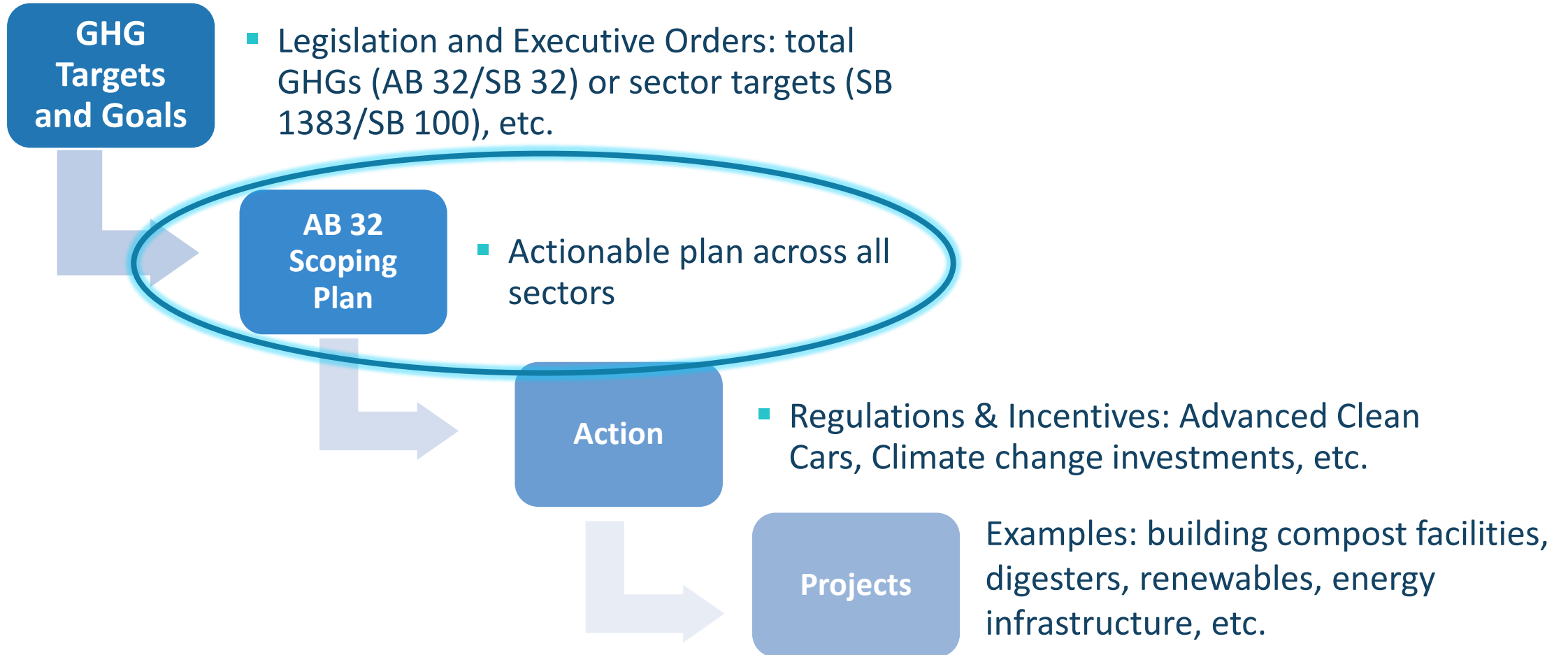


# Uplifting Equity

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- Drastic reductions in fossil fuel combustion will provide health benefits to overly burdened communities located adjacent to freeways and stationary sources
- Community Vulnerability Metric (CVM)
  - Not all communities face same impacts from climate change
  - Not all communities are equal in resiliency
  - CVM will identify additional social carbon costs at census tract level experienced due to disparate climate impacts (heat, drought, etc.)
  - Assist in identifying where and how to build community resiliency
  - Will be incorporated into the final plan

# California's Climate Policy Framework



# Multi-State Agency Effort



List is not exhaustive

# Incorporation of EJ Advisory Committee Recommendations

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Over a dozen EJAC meetings since summer 2021

EJAC provided feedback on modeling inputs

Over 200 draft EJAC recommendations to inform Draft 2022 Scoping Plan

5 dozen references to EJAC recommendations in Draft 2022 Scoping Plan

# What Carbon Neutrality Means

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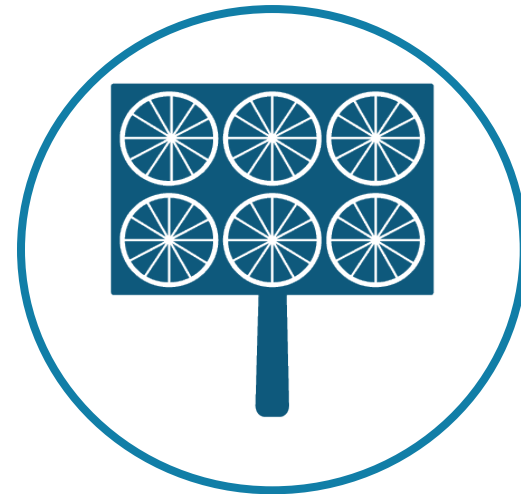
Continue to reduce emissions from sources in the AB 32 GHG Inventory

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Emissions and sequestration from natural and working lands

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Technological Carbon Dioxide Removal


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Carbon Neutral


# AB 32 GHG Inventory Sector Alternatives




Proposed Scenario (Alt 3): carbon neutrality by 2045, deploy a broad portfolio of existing and emerging fossil fuel alternatives and clean technologies, and align with statutes and Executive Orders



Alternative 1: carbon neutrality by 2035, nearly complete phaseout of all combustion, limited reliance on carbon capture and sequestration and engineered carbon removal, restricted applications for biomass-derived fuels

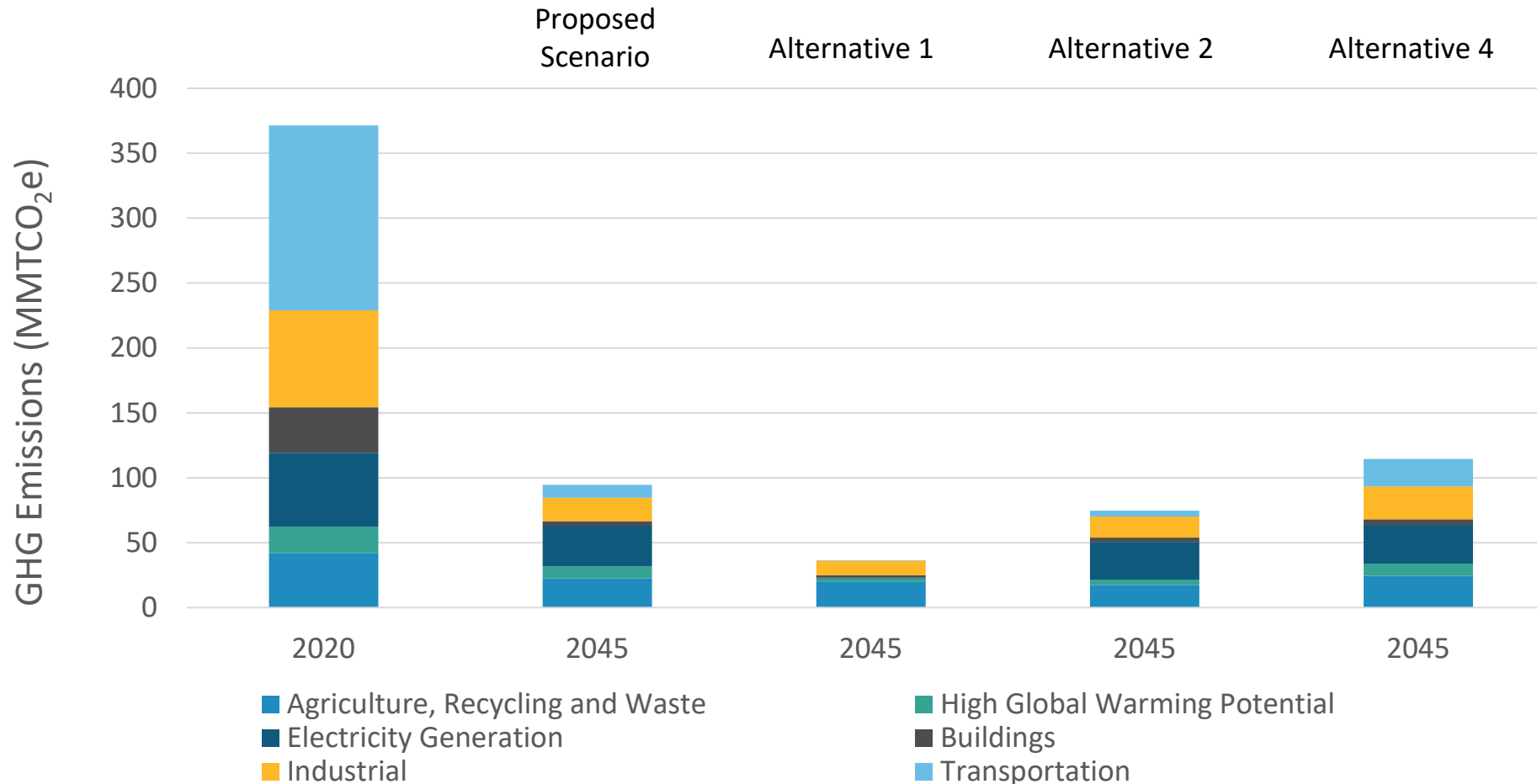


Alternative 2: carbon neutrality by 2035 and aggressive deployment of a full suite of technology and energy options, including engineered carbon removal




Alternative 4: carbon neutrality by 2045, deployment of a broad portfolio of existing and emerging fossil fuel alternatives, slower deployment and adoption rates than the Proposed Scenario, and a higher reliance on CO<sub>2</sub> removal

# Scenario Emissions Modeling – AB 32 GHG Inventory Sectors




# Natural and Working Lands Carbon Alternatives


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Proposed Scenario (Alt 3): Land management activities that prioritize restoration and enhancement of ecosystem functions to improve resilience to climate change impacts, including more stable carbon stocks



NWL Alternative 1: Land management activities that prioritize short term carbon stocks in our forests and through increased climate smart agricultural practices on croplands



NWL Alternative 2: Land management activities representative of California's current commitments and plans



NWL Alternative 4: Land management activities that prioritize reducing wildfires in forests, shrublands, and grasslands



# Key Considerations for Evaluating Scenarios: AB 32 Inventory Sectors

**Achieve Carbon  
Neutrality No Later Than  
2045**

All Scenarios

## **Feasibility**

- Technology Readiness/Costs
- Consumer Adoption
- Permitting
- Affordability

Alternatives 3 and 4 with longer  
timeframe more feasible

## **Health, Economic and Other Benefits**

- Public health
- Employment
- 80% GHG reductions at sources
- Existing statutes and Executive Orders

Alternative 3 performs  
best

Staff Proposed Scenario  
(Alt 3)

# Key Considerations for Evaluating Scenarios: Natural and Working Lands

## Advances State NWL Strategies and Achieves NWL Co-benefits

- Carbon storage
- Fuels and wildfire reductions
- Land restoration/protection and healthy soils

Alternatives 3 and 2 meet largest mix of strategies

## Feasibility

- Implementation timelines
- Achievable acres and management levels

Alternatives 3 and 2 more feasible

## Economic and Public Health Outcomes

- Lowest implementation costs
- Less employment & overall economic impacts
- Highest public health benefits

Alternative 3 performs best

Staff Proposed Scenario  
(Alt 3)

# The Proposed Scenario

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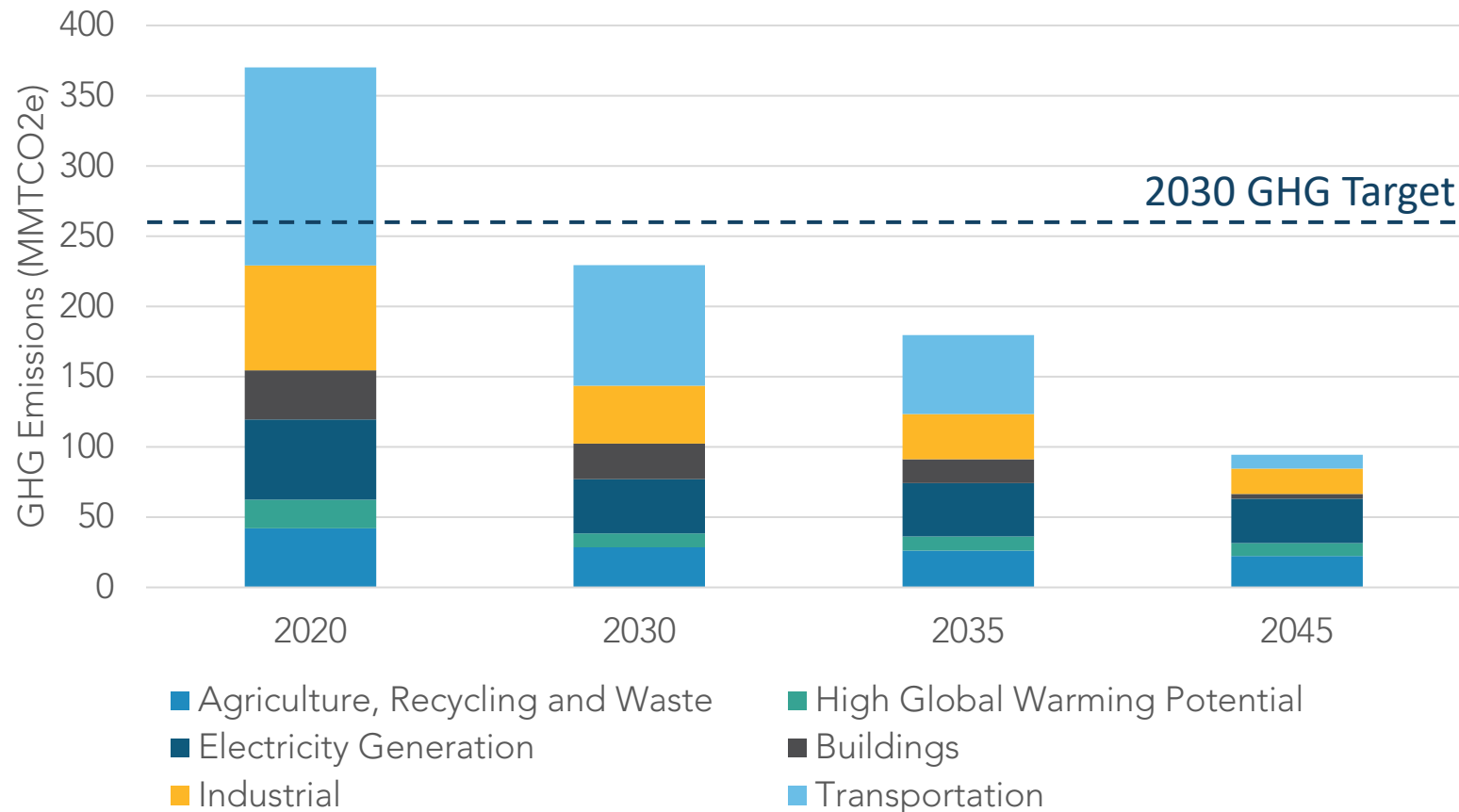
AB 32 GHG  
Inventory Sectors

Carbon neutrality by 2045, deploy a broad portfolio of existing and emerging fossil fuel alternatives and clean technologies, and align with statutes and Executive Orders

Natural and  
Working Lands

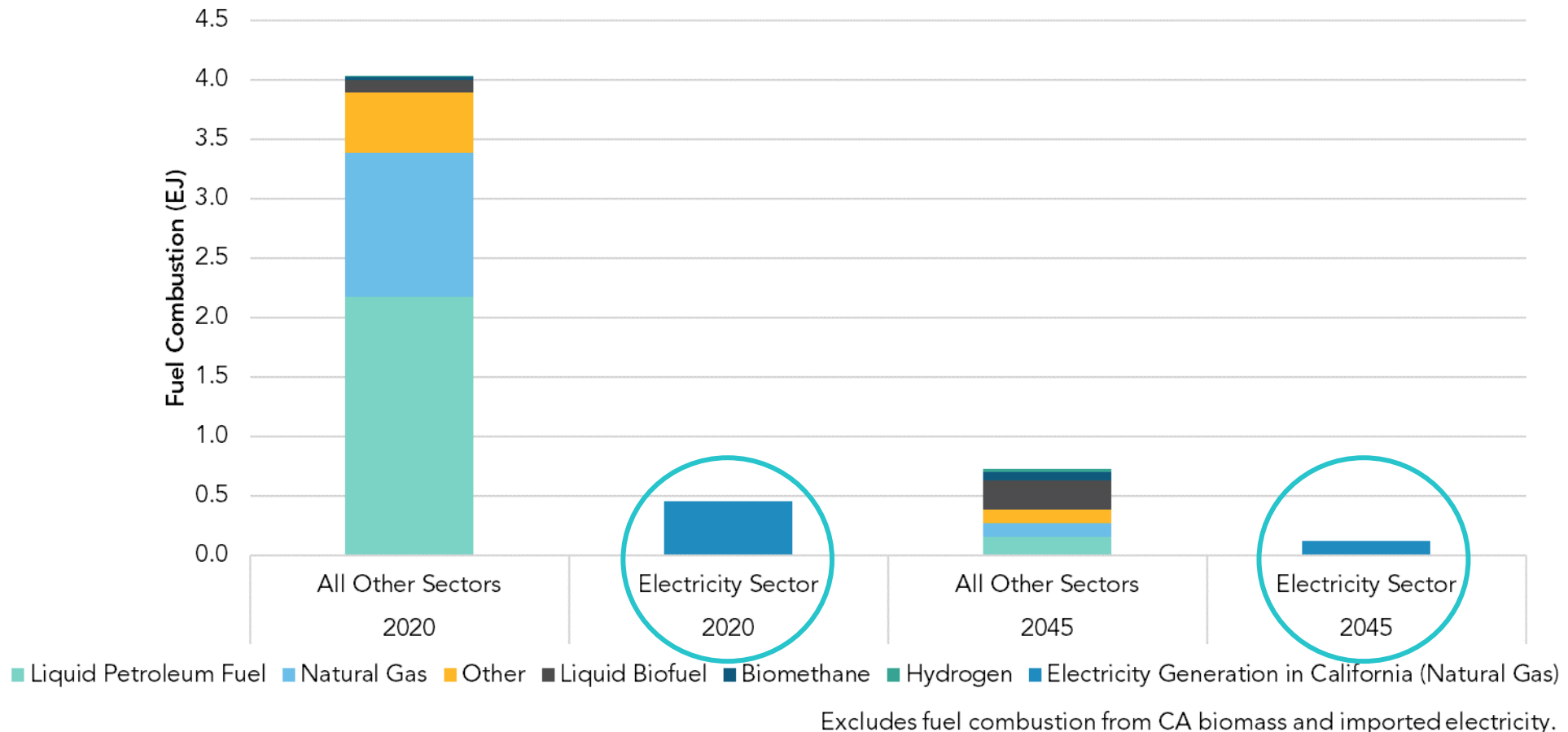
Land management activities that prioritize restoration and enhancement of ecosystem functions to improve resilience to climate change impacts, including more stable carbon stocks

# Proposed Scenario: Significant GHG Reductions at Sources



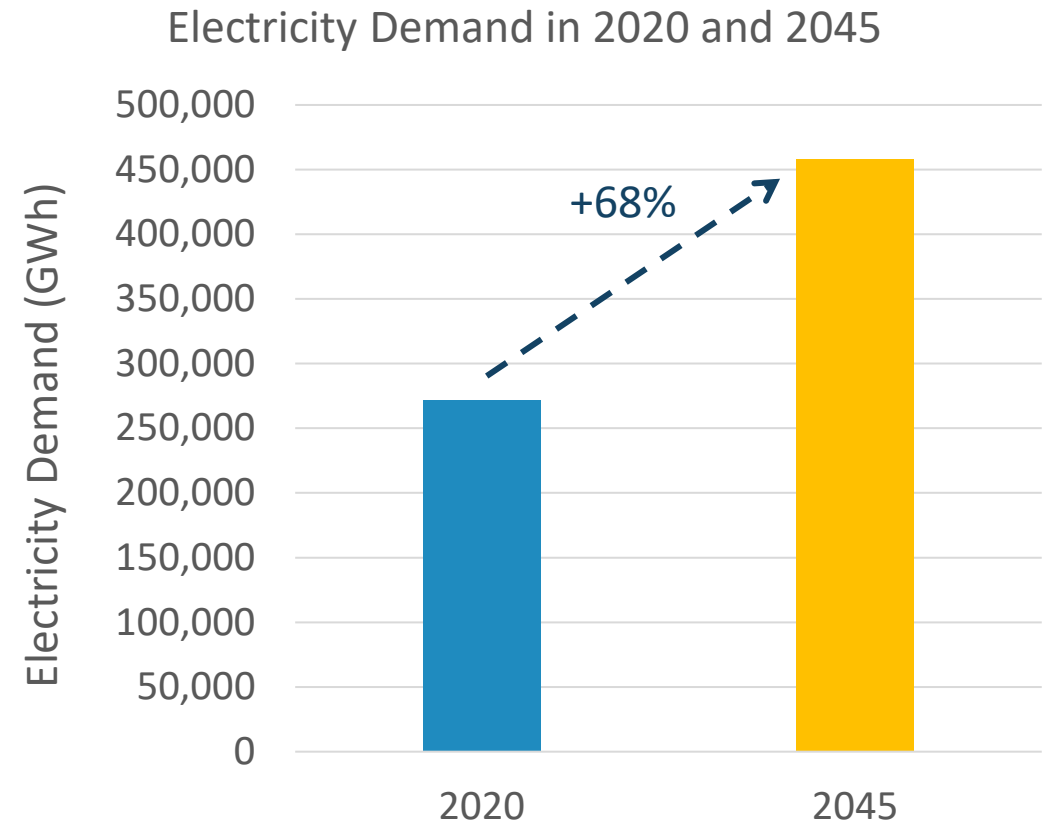
Successful implementation of the Proposed Scenario would exceed the SB 32 GHG Target of 40% below 1990 levels by 2030

# Proposed Scenario: Fossil Fuel Combustion Declines Significantly Across all Sectors

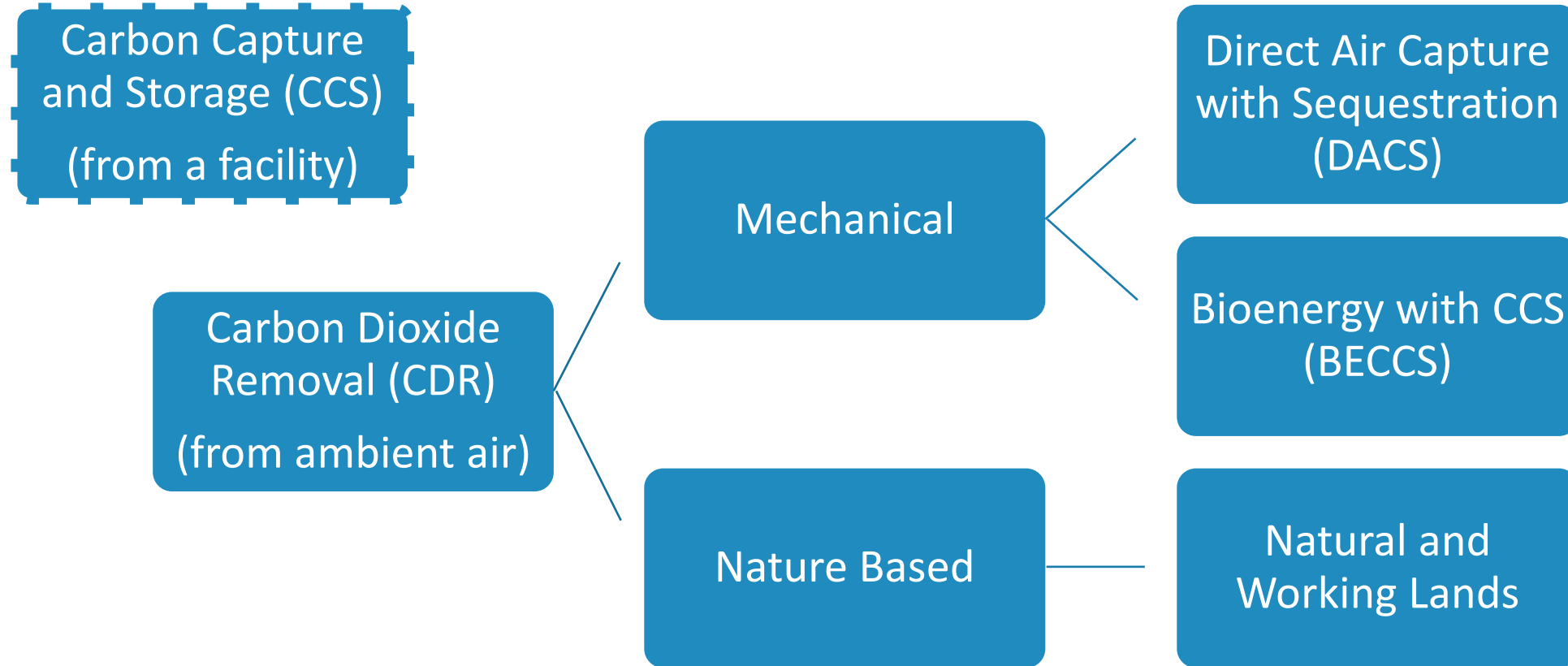


# Affordable, Reliable, and Clean Electricity Grid

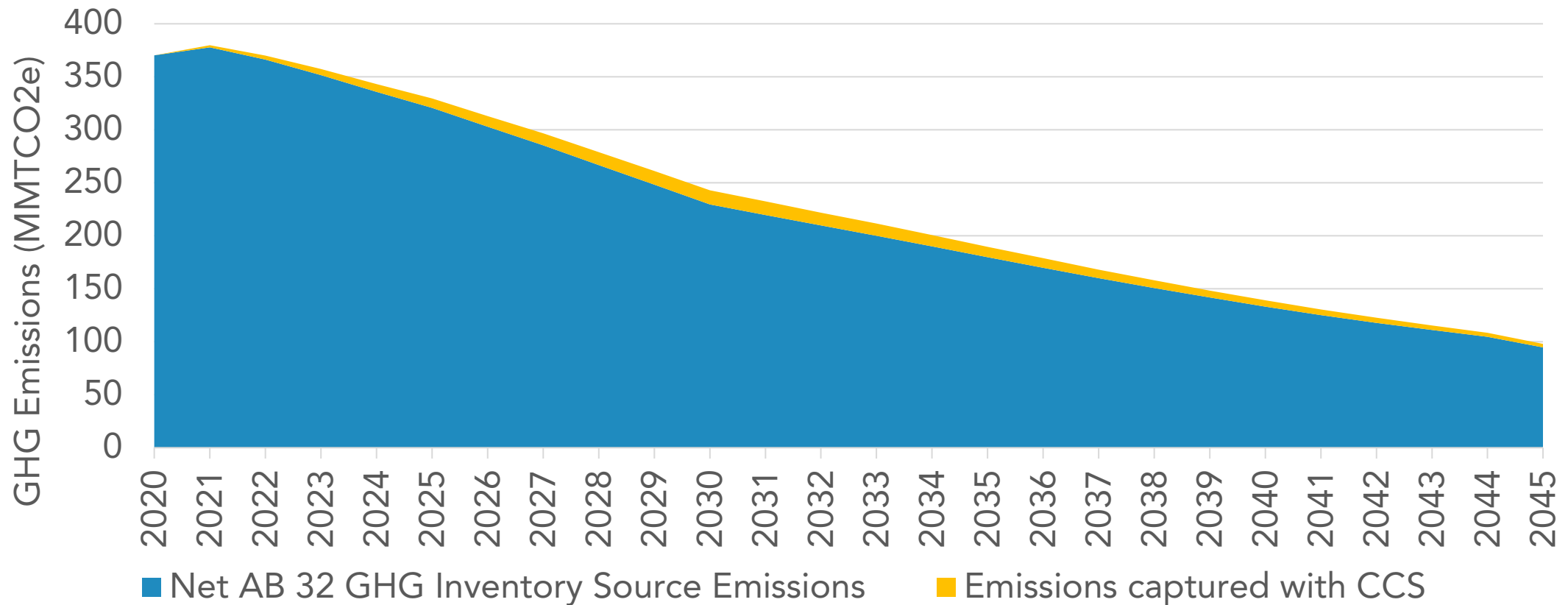
- Electricity demand 68% higher by 2045 as power sector plays bigger role
- More intermittent renewables will require more dispatchable resources for reliability
  - New 10 GW of natural gas capacity is only needed if sufficient renewable power is not available
- Opportunities to increase storage and increase energy efficiency can reduce need for new gas capacity builds



# Carbon Removal and Sequestration



# Targeted Deployment of CCS



Strategic deployment of CCS on hard to decarbonize sectors



# NWL and the Scoping Plan

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Healthy trees, plants, and soils can support our greenhouse gas reduction goals in two primary ways:

1. Serving as carbon sinks through sequestration.
2. Avoiding releases of emissions from their substantial existing carbon stocks.

We are not focusing on maximizing carbon across all landscape types.

We are focusing on supporting carbon management that fosters ecosystem health, resilience and many other ecosystem services.

# Landscapes Included in the Draft

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Forests, shrublands, and grasslands



Annual and perennial croplands



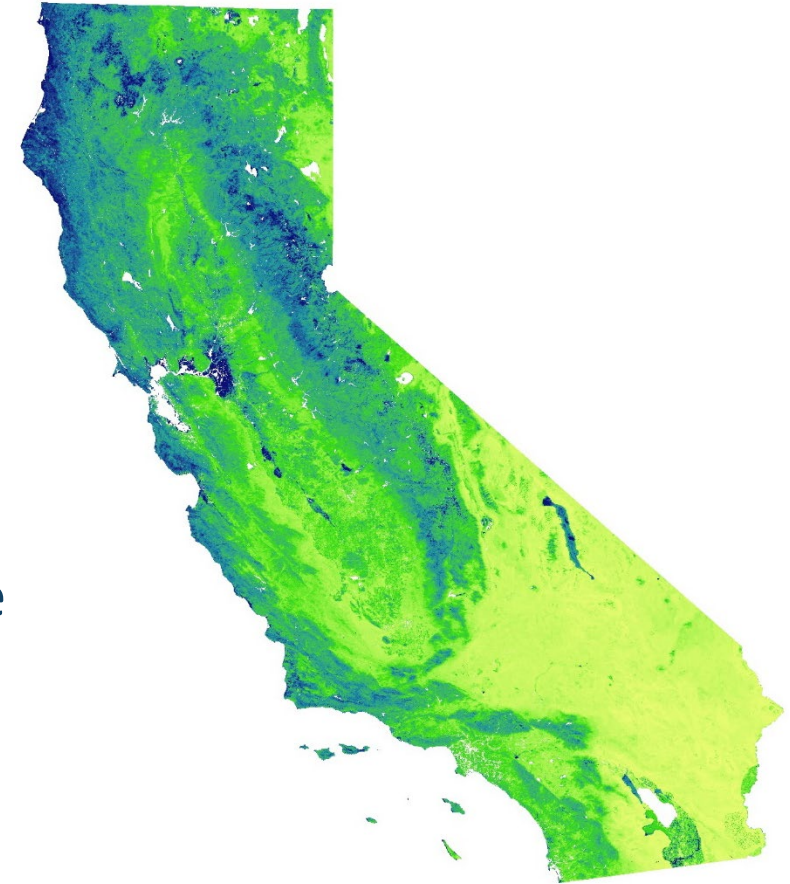
Sacramento-San Joaquin Delta



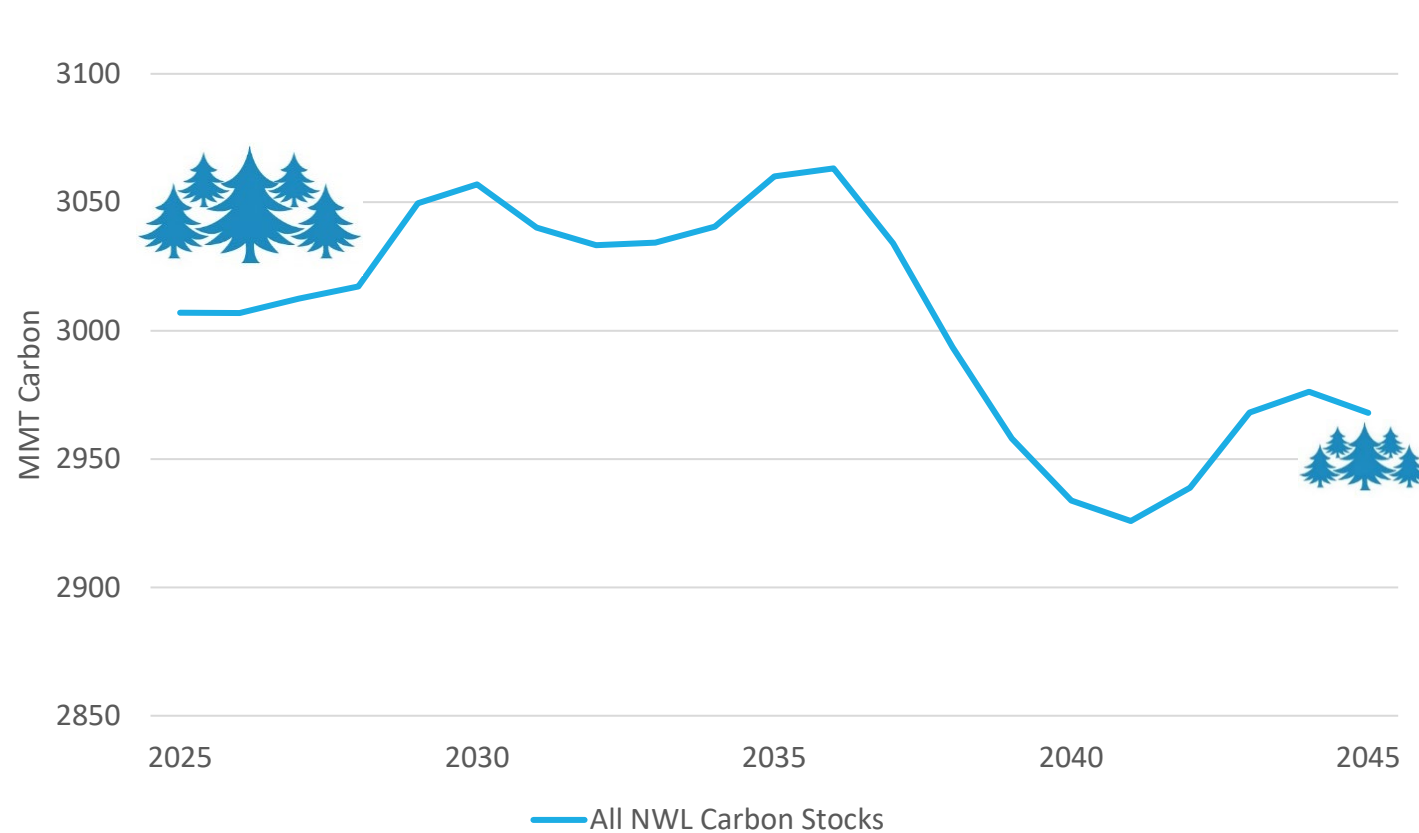
Urban forests and wildland urban interface



Deserts



# NWL Carbon Stock Loss Over Time



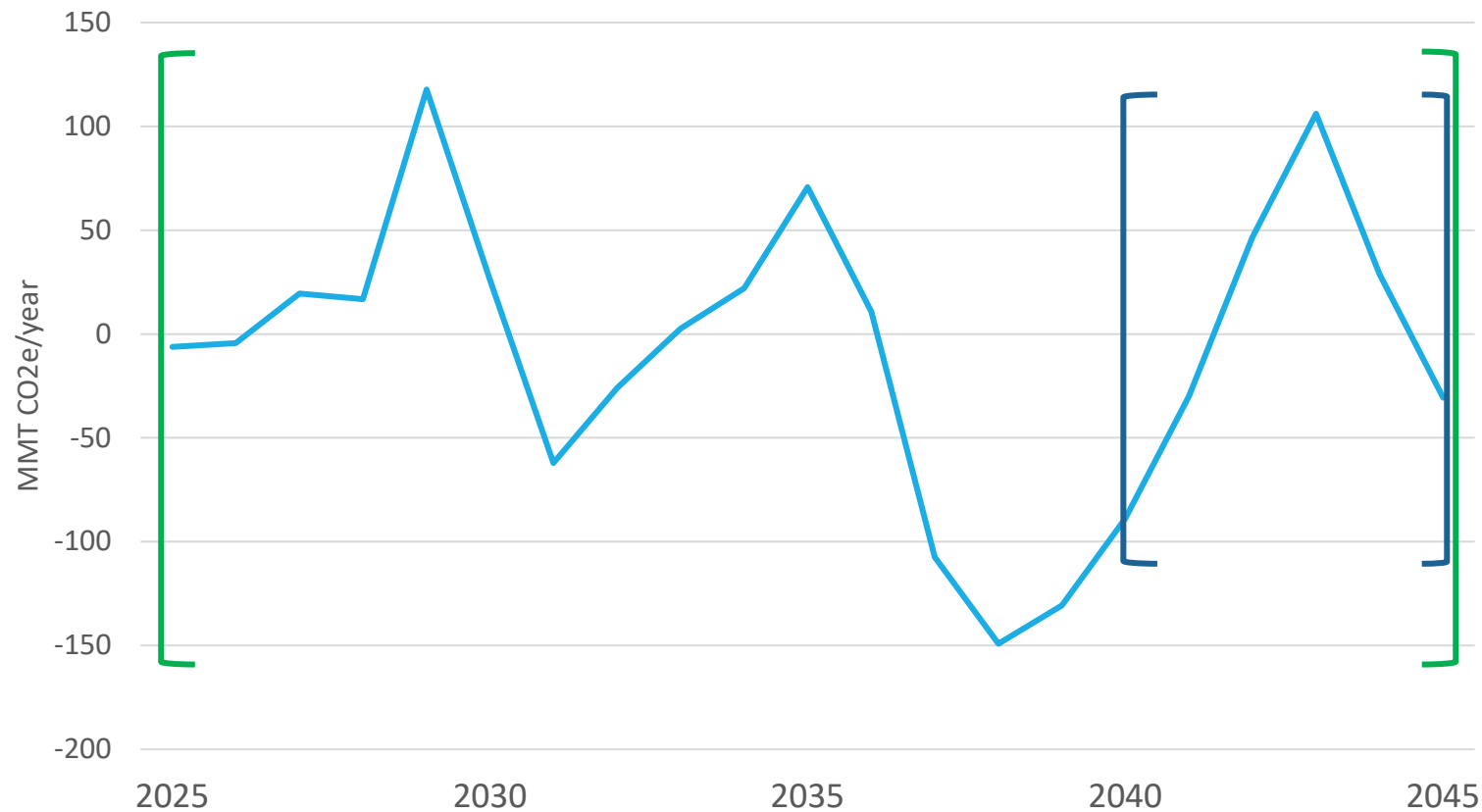
Carbon stocks include:

- Above and below ground biomass
- Soil carbon in annual croplands and wetlands
- Harvested wood products

Carbon on lands in constant flux

- Decreasing trend through 2045
- Photosynthesis results in CO<sub>2</sub> removals
- Wildfire, decay, and soil oxidation result in CO<sub>2</sub> and CH<sub>4</sub> emissions
- N<sub>2</sub>O emissions calculated as well

# Annual NWL Sequestration/Emissions Rate



20 yr average rate from 2025-2045  
**-8 MMTCO<sub>2</sub>e**

5 yr average rate from 2040-2045  
**24 MMTCO<sub>2</sub>e**

- NWL can be source/sink depending on timescale
- 20 year average ultimately used in Draft Scoping Plan to reflect long-term trajectory of NWLs
- Using 20 year average, additional CDR may be necessary to compensate for NWL emissions

# Role and Scaling of Carbon Removal



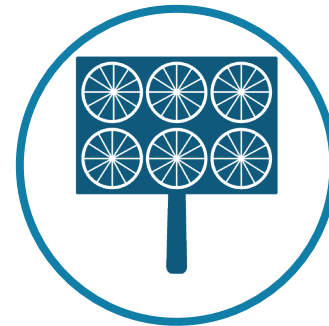
**AB 32 Inventory Sectors: Significantly reduced, but some emissions remain**

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**NWL a source**

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**Need carbon removal to compensate for AB 32 and NWL sectors**

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**Carbon Neutral**

- **Role of CDR is reduced if:**
  - We reduce the emissions from the AB 32 Sectors faster
  - NWL is able to become a sink

# Additional Topics in Draft Scoping Plan

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- Convening of multiagency group with communities to discuss options to ensure safe, reliable deployment of CCS
- Cap-and-Trade role in achieving 2030 target is reduced due to following:
  - New legislation: SB 350, SB 596
  - More stringent programs: LCFS, proposed ACC 2
  - Reductions in emissions due to pandemic related impacts
- \$20.3 billion in Cap-and-Trade auction proceeds generated since 2014
  - 50% of implemented projects benefitting the State's disadvantaged and low-income communities

# Consideration for Revisions to the Proposed Scenario

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- Opportunity to update modeling for the proposed scenario for the final plan
- Increased or faster deployment of clean technology will necessitate clean energy to be available for those technologies
  - Earlier deployment of ZEVs means faster build out of renewable electricity than in the proposed plan
  - Actions that increase energy efficiency do not require faster build out of renewable electricity
- Adjust management action on natural and working lands based on feedback
  - Implementation timelines and acres for forest sector management
  - Accelerating action in non-forest lands
  - Consider both modeled and non-modeled actions

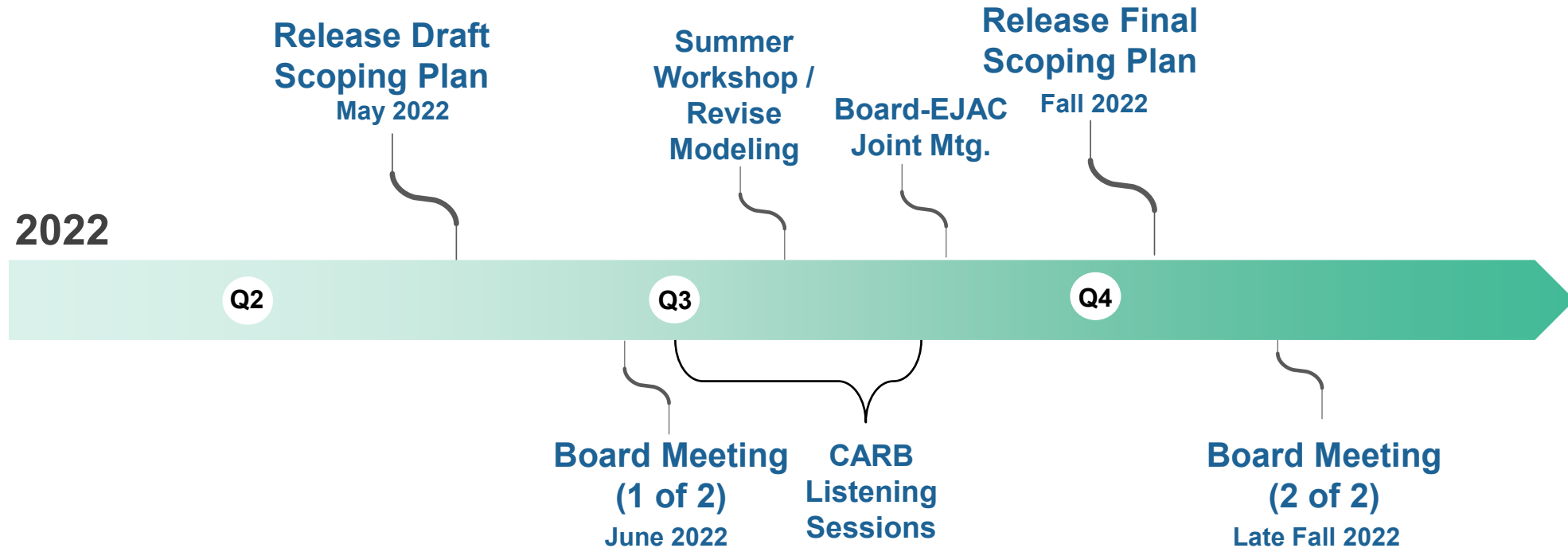
# Environmental Analysis

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- Draft Environmental Analysis (EA) completed
- Released for 45-Day public comment period
  - May 10, 2022 – June 24, 2022
- Prepare written responses to timely comments on Draft EA
- Present Final EA and written responses to comments on Draft EA to Board
  - Fall 2022



# 2022 Scoping Plan Update Schedule



**EJAC Meetings and Community Meetings (ongoing)**

**Scoping Plan Workshops (ongoing)**