



Update on the 2030 Target Scoping Plan

November 17, 2016



Outline

- ▣ 2030 Target Scoping Plan Overview
- ▣ Climate Change and Public Health
- ▣ Natural and Working Lands
- ▣ Preliminary Policy Scenario Evaluations
- ▣ Local Action
- ▣ Next Steps

Directives and Legislation

- ▣ Scoping Plan required by Assembly Bill 32
- ▣ Executive Order B-30-15
 - Establishes midterm greenhouse gas (GHG) emissions reduction target of 40% below 1990 levels by 2030
 - Update the AB 32 Scoping Plan to incorporate the 2030 greenhouse gas target
- ▣ Senate Bill 32 (SB32) codifies 2030 midterm GHG target
- ▣ AB 197
 - Consider the social costs of GHG reductions
 - Prioritize measures resulting in direct emission reductions
 - Follow existing AB 32 requirements—including considering cost-effectiveness and minimizing leakage

Objectives for Scoping Plan

- ▣ Achieve 2030 target
- ▣ Provide direct GHG emissions reductions
- ▣ Minimize emissions leakage
- ▣ Facilitate sub-national and national collaboration
- ▣ Support cost-effective and flexible compliance
- ▣ Support US EPA Clean Power Plan
- ▣ Support climate investment for programs in disadvantaged communities
- ▣ Provide air quality co-benefits
- ▣ Protect public health

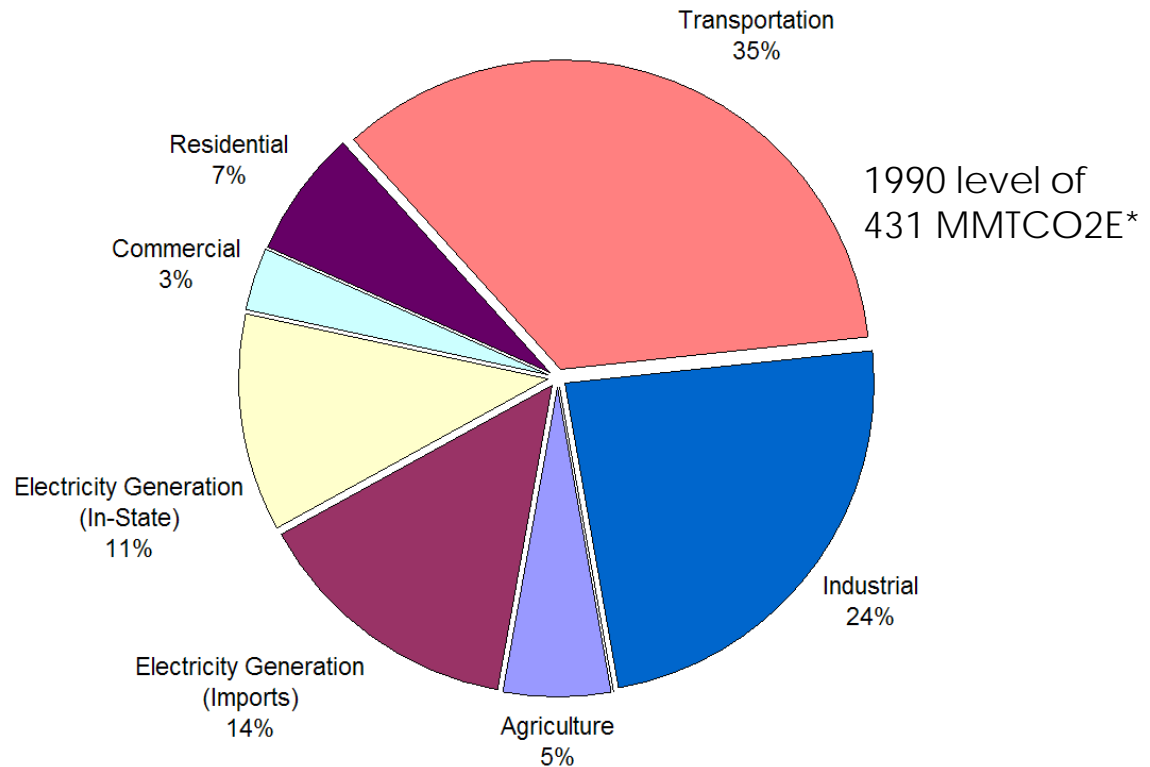
Climate Change & Public Health

- ▣ Climate change impacts everyone, but most vulnerable will suffer the most
 - Amplifies existing health risks
- ▣ Addressing climate change impact inequities
 - Climate investments to promote economic development and health equity
 - Supporting access to clean technology

GHG Emission Sources by Sector

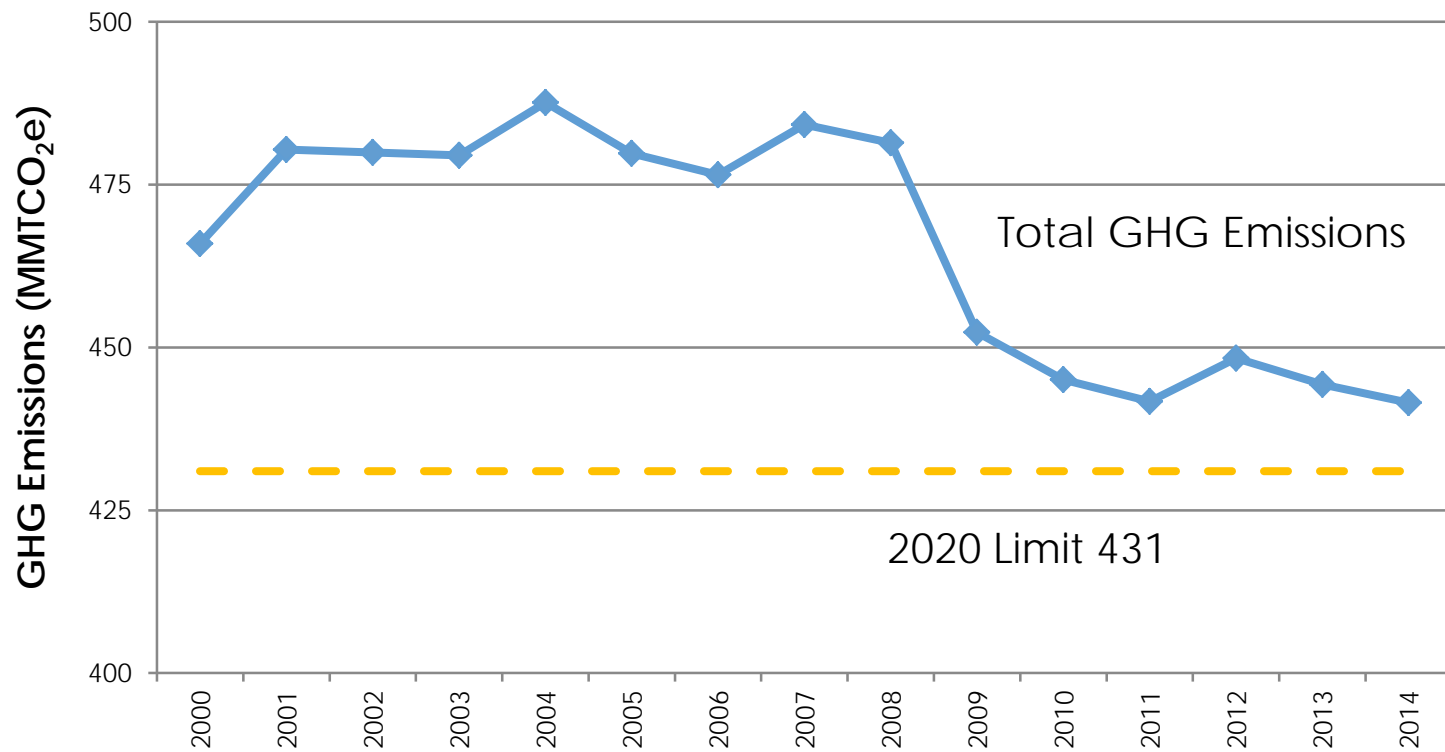
Note:

- Natural & Working Lands (NWL) are **not** included in the scope of the statewide limit
- ~898 MMT carbon in "live stocks" –forests, grasses, scrub
- NWL sector will be evaluated in this Scoping Plan with modeling analyses and inventory updates



*https://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf

California GHG Inventory Progress to Date



Natural & Working Lands

- ▣ *Goals: Manage California's Natural and Working Lands, including greenspace in urban and other built environments and state waters, to be a net sink of carbon through 2030-and beyond.*
- ▣ Expand the scope of lands (and waters) targeted for carbon sequestration
- ▣ New ARB NWL Inventory
- ▣ NWL Modeling
 - Define and measure the “business as usual” case for land-based carbon sequestration and GHG emissions
 - Identify and assess land use and management or restoration treatments that are expected to secure or increase carbon sequestration rates
- ▣ Identify and pursue implementation pathways

Role of Models in the Scoping Plan

Role of Models

- ▣ Help analyze GHG impacts of policies and technology, including future projections
- ▣ Help understand cost impacts of different policies
- ▣ Several models exist to support these types of analyses

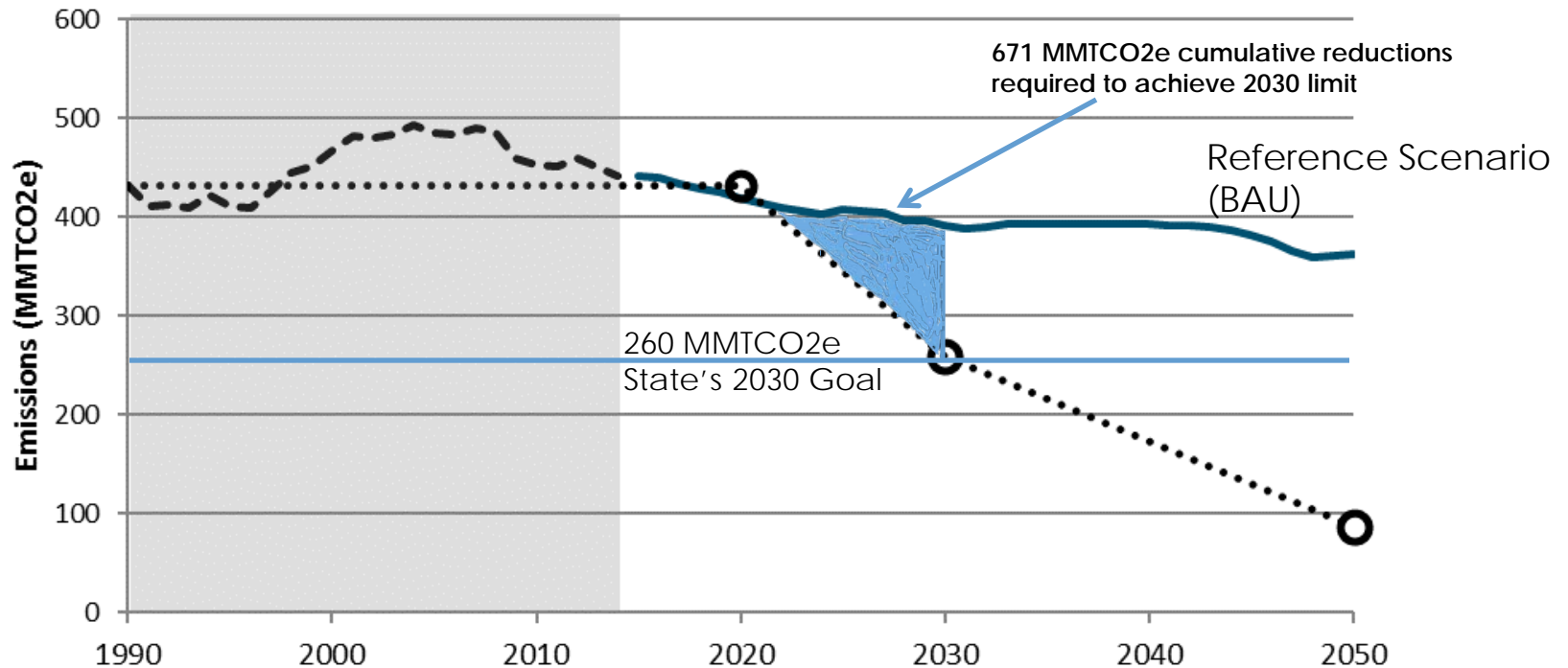
PATHWAYS

- ▣ Estimates GHG reductions and direct technology, energy, and fuel costs of the scenarios
- ▣ Integrated economic and energy sectors to reflect interactive effects

REMI

- ▣ Models the economic impact of GHG reduction scenarios on the California economy
- ▣ Uses technology and fuel costs from PATHWAYS as an input
- ▣ Estimates the indirect and induced impacts of GHG reduction scenarios
- ▣ Provides estimates of impact of scenarios on industrial sectors, individuals, and overall California economy

Updated Reference Scenario



2030 Target

- SB 32 2030 target is 260 MMTCO₂e
- The 671 MMTCO₂e reflects the estimated cumulative reductions needed between 2021 and 2030 to achieve the 2030 target
- Cumulative reductions over time complement the 2030 target as they provide a means to track progress of mitigation measures
 - Performance of individual measures changes over time
 - Provides more analysis flexibility than just a snap shot of a single year

2030 Baseline Policies and Measures

- 2030 baseline policies and measures do not achieve the 2030 target of 260 MMTCO₂e
- 2030 GHG emissions estimated to be ~301 MMTCO₂e for baseline policies and measures
 - SB 350-increase renewable energy and energy efficiency
 - SB 1383/Short-Lived Climate Pollutant Plan
 - SB 375 – support sustainable community development
 - Mobile Source Strategy- help State achieve its federal and state air quality standards
 - Low Carbon Fuel Standard
 - Sustainable Freight Action Plan

Closing the Gap

- ▣ Consider legislative direction and Scoping Plan objectives
- ▣ Potential options to fill remaining gap:
 - Enhance and extend existing programs
 - New policies and regulations
- ▣ Evaluated three draft scenarios
 - All three scenarios rely on a mix of measures
 - Scoping plan scenario (Cap-and-Trade)
 - No Cap-and-Trade (Alternative 1)
 - Carbon Tax (Alternative 2)

Draft Scoping Plan Policy Scenario

- ▣ 2030 Baseline Policies and Measures

Plus:

- ▣ New Refinery Efficiency Measure for All Facilities in the Sector
 - Fewer GHG emissions per barrel of a refined product
 - Estimated to achieve 20 percent GHG reductions by 2030
- ▣ Post-2020 Cap-and-Trade Program

Alternative 1 (No Cap-and-Trade)

- ▣ **Enhanced** 2030 Baseline Policies and Measures
- ▣ **Enhanced** Refinery Efficiency Measure for All Facilities in the Sector
 - 30 percent GHG reduction by 2030
- ▣ New Efficiency Measure: Industrial Sector Measures for All Facilities in the Sectors
 - 25 percent GHG reduction by 2030
- ▣ New Incentive Measure: Early retirement and replacement of older inefficient gasoline light-duty vehicles and furnaces
- ▣ New Measure: Renewable gas standard for natural gas suppliers
- ▣ New Measure: Heat pumps in buildings

Alternative 2 (Carbon Tax)

- ▣ 2030 Baseline Policies and Measures

Plus:

- ▣ New Refinery Efficiency Measure for All Facilities in the Sector
 - Fewer GHG emissions per barrel of a refined product
 - Estimated to achieve 20 percent GHG reductions by 2030
- ▣ Carbon tax post-2020

Draft Scoping Plan and Alternative 2 (Carbon Tax) GHG Emissions by Sector in 2030

Preliminary Estimated GHGs by Sector [MMTCO ₂ e]				
	1990	Sector GHG emissions in 2030	Change in GHGs	% change from 1990
Agriculture	25	24	-1	-5%
Residential and Commercial	44	38	-6	-14%
Electric Power	108	36	-72	-67%
High GWP	3	10	7	+217%
Industrial	97	77	-20	-20%
Recycling and Waste	7	9	2	+24%
Transportation	152	106	-46	-30%
Net sink	-7	n/a	n/a	n/a
Cap-and-Trade/Carbon Tax	n/a	-40	n/a	n/a
Total	431	260	-171	-40%

2030 GHG Emissions by Sector: Alternative 1 (No Cap-and-Trade)

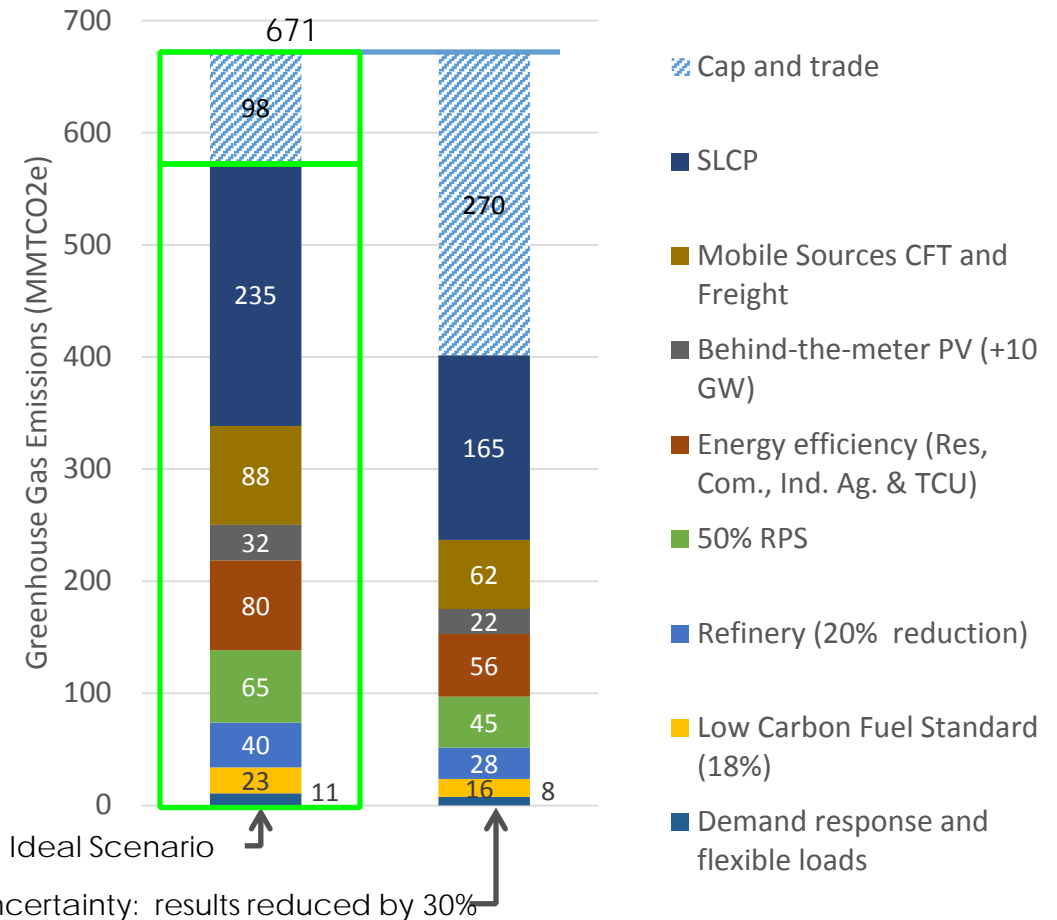
Preliminary GHGs by Sector [MMTCO ₂ e]				
	1990	Sector GHG emissions in 2030	Change in GHGs	% change from 1990
Agriculture	25	23	-2	-7%
Residential and Commercial	44	32	-12	-27%
Electric Power	108	30	-78	-73%
High GWP	3	10	7	+217%
Industrial	97	66	-31	-32%
Recycling and Waste	7	9	2	+24%
Transportation	152	93	-58	-38%
Net sink	-7	n/a	n/a	n/a
Total	431	~264 (few short of 260)	-167	-39%

Estimated 2021-2030 GHG Reductions Draft Scoping Plan Scenario (Cumulative)

GHG Reductions Summary

- Ideal scenario: current and proposed programs begin today
- Uncertainty scenario: programs do not begin until 2021 & reflects other uncertainties
- Baseline policies achieve 543 M MTCO₂e (Refinery measure achieves ~40 MMTCO₂)
- Cap-and-Trade achieves:
 - ~98 MMTCO₂e if all measures meet expectations
 - Up to ~270 MMTCO₂e if measures fall short

Estimated Cumulative 2021 -2030 GHG Reductions Ranges MMTCO₂e*



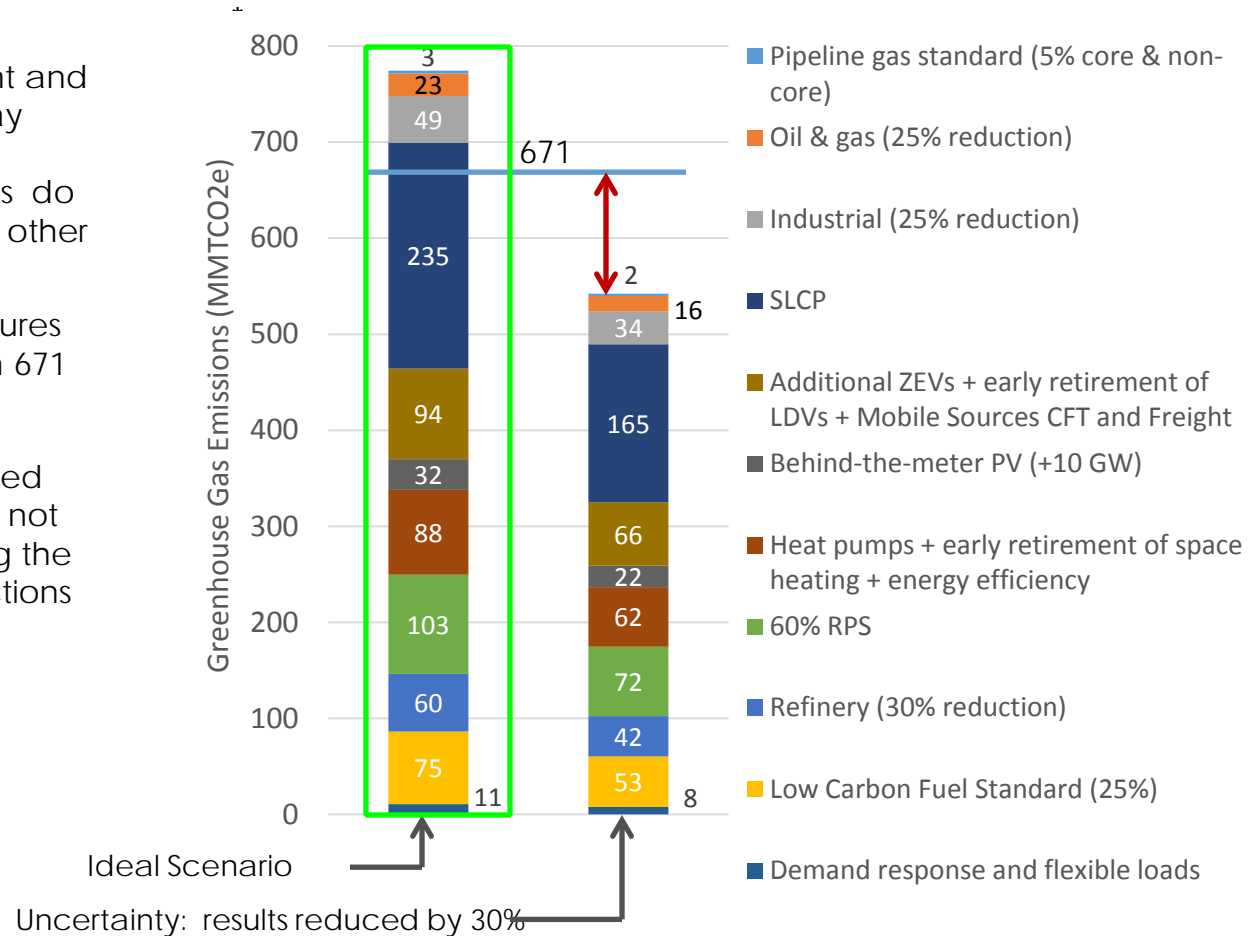
*Ranges reflect uncertainty of achieving measure reductions, assumed here at 30%

Estimated 2021-2030 GHG Reductions Alternative 1 (No Cap-and-Trade) (Cumulative)

GHG Reductions Summary

- Ideal modeled scenario: current and proposed programs begin today
- Uncertainty scenario: programs do not begin until 2021 & reflects other uncertainties
- Under ideal conditions, if measures meet expectations, more than 671 MMTCO₂e
- If measures fall short of expected reductions, the scenario does not achieve the 2030 limit requiring the development of additional actions to meet the target

Estimated Cumulative 2021 -2030 GHG Reduction Ranges MMTCO₂e



*Ranges reflect uncertainty of achieving measure reductions, assumed here at 30%

Scenario Policy Analysis

Draft Scoping Plan Scenario

Benefits

- ▣ Majority of reductions due to baseline policies and measures
- ▣ New measures delivers refinery facility GHG emission reductions
- ▣ Declining cap delivers additional GHG reductions beyond other measures to achieve the 2030 limit
- ▣ Cap-and-Trade Program constrains emissions through a declining emissions limit and scales to provide additional reductions if other measures do not perform as expected
- ▣ Free allocation to minimize emissions leakage, where identified

Scenario Policy Analysis

Draft Scoping Plan Scenario, cont.

Benefits, cont.

- ▣ Provides compliance flexibility and allows for continuation and expansion international and subnational collaboration through linkages
- ▣ Provides auction proceeds for Greenhouse Gas Reduction Fund Investments
- ▣ Can-be adapted for Clean Power Plan (CPP) compliance mechanism

Drawbacks

- ▣ Different legal interpretations about authority

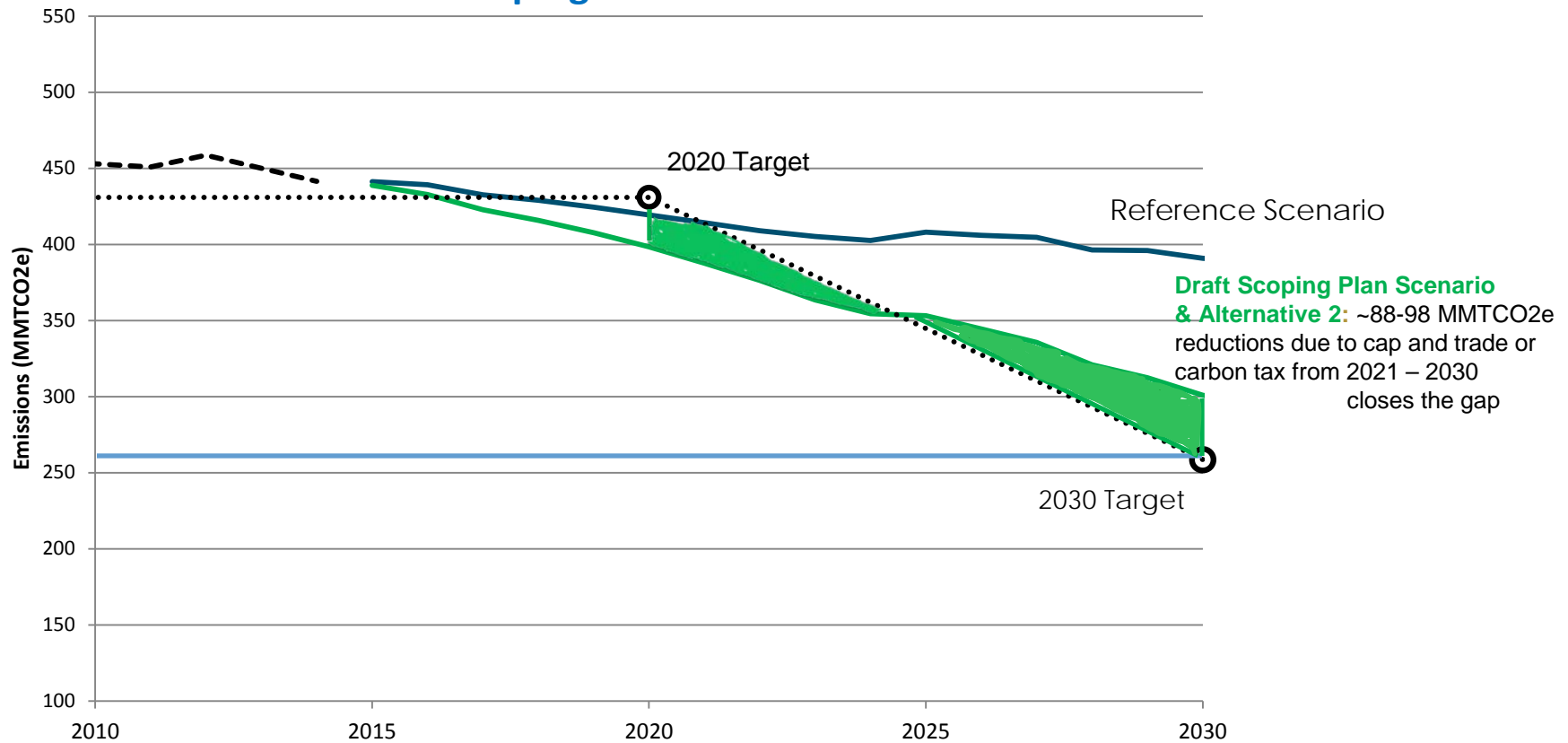
Scenario Policy Analysis

Draft Scoping Plan Scenario, cont.

- Cap-and-Trade Program
 - Considerations to reflect AB 197 direction
 - Potential design changes could support greater GHG emissions reductions at covered entities
 - Evaluate limiting offsets for post-2020
 - Change allocation methodology to reflect expected decline in GHG compliance obligation, not just minimizing emissions leakage
 - Decrease allocation if a covered facility reports an increase in onsite criteria and toxics emissions

Preliminary GHG Modeling Results

Draft Scoping Plan Scenario and Alternative 2



Scenario Policy Analysis

Alternative 1 (No Cap-and-Trade)

Benefits

- ▣ Under ideal conditions, estimated to deliver more cumulative emissions reductions than needed to achieve the 2030 limit, but emissions start to increase in later years
- ▣ Majority of reductions due to enhanced known commitments
- ▣ New measures deliver refinery and industrial facility GHG emission reductions

Drawbacks

- ▣ New statutory authority is needed for some policies and measures
- ▣ Fewer options for minimizing emissions leakage

Scenario Policy Analysis

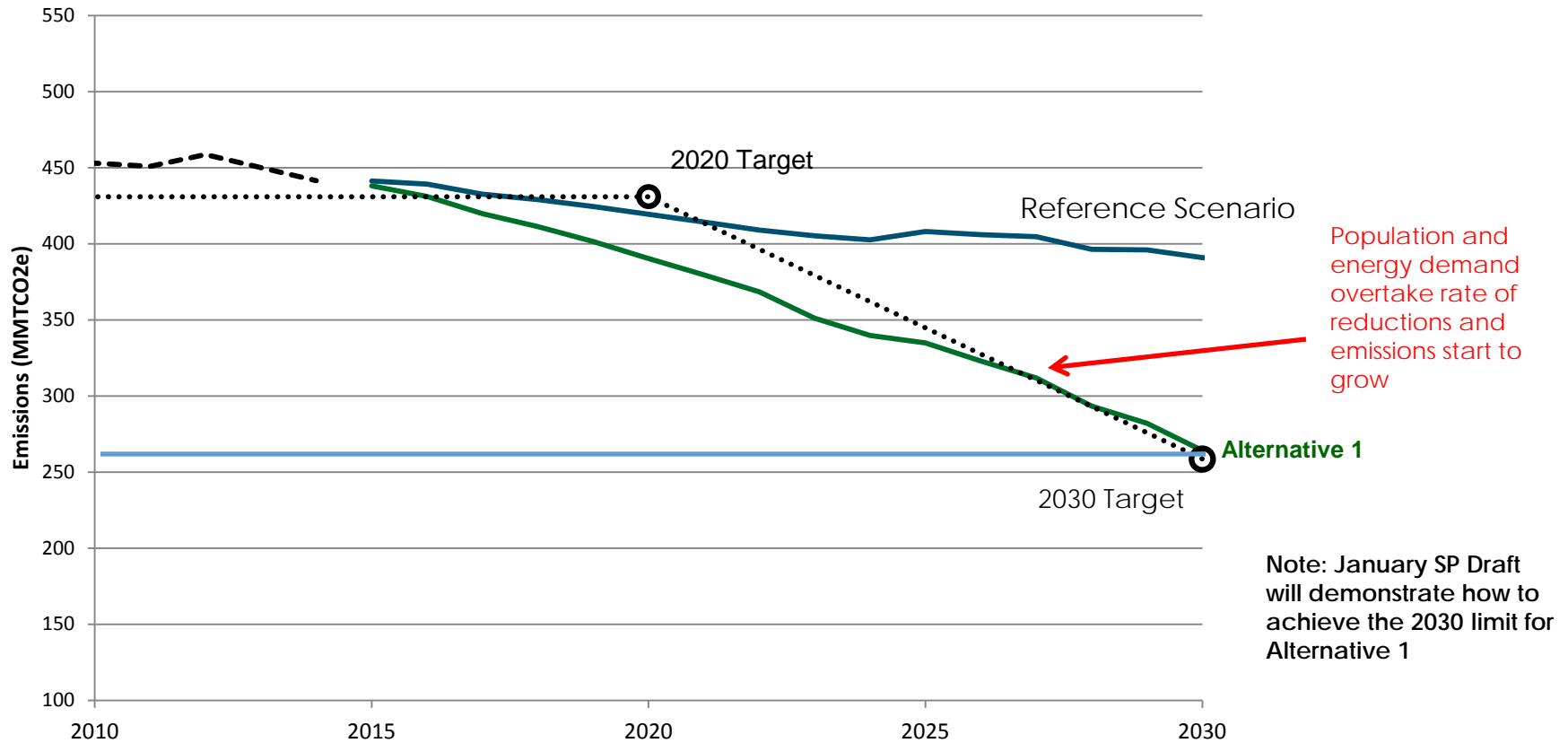
Alternative 1 (No Cap-and-Trade), cont.

Drawbacks, cont.

- ▣ Limited opportunities for international or subnational collaboration through linkages
- ▣ No auction proceeds to fund Greenhouse Gas Reduction Fund Investments
- ▣ Would need to identify other measures for compliance with CPP
- ▣ Need additional funding for new incentive programs---(e.g. retiring & replacement of older cars)

Preliminary GHG Modeling Results

Alternative 1 – No Cap-and-Trade



Scenario Policy Analysis

Alternative 2 (Carbon Tax)

Benefits

- ▣ Majority of reductions due to known commitments
- ▣ New measure delivers refinery facility GHG emission reductions
- ▣ Provides compliance flexibility
- ▣ Could provide revenue for potential Greenhouse Gas Reduction Fund Investments, or other uses

Drawbacks

- ▣ Carbon tax does **not include** an explicit emissions limit (does not guarantee reductions)
- ▣ If reductions aren't realized, additional measures need to be implemented quickly to make up unrealized reductions

Scenario Policy Analysis

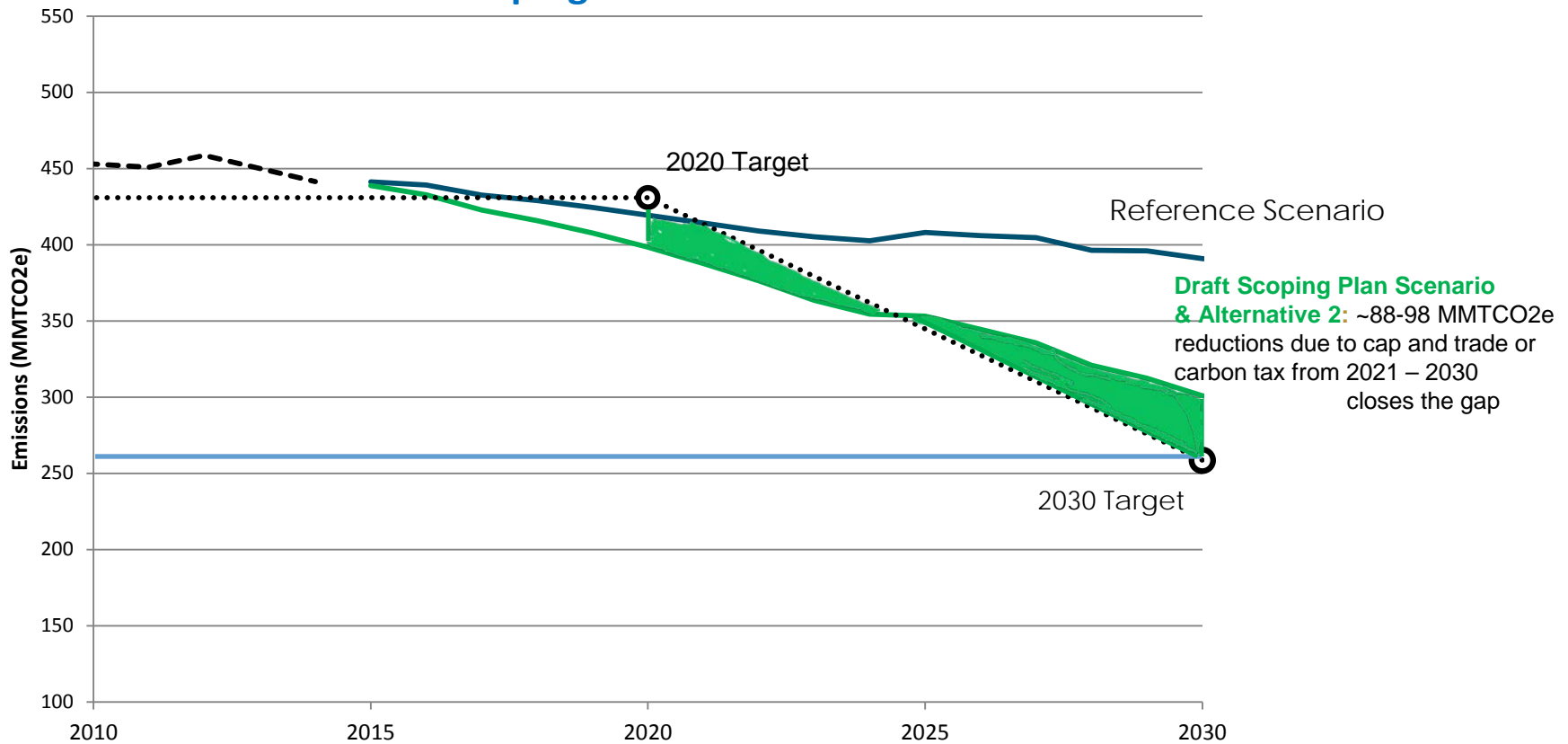
Alternative 2 (Carbon Tax) cont.

Drawbacks, cont.

- ▣ New statutory authority is needed
 - Structure of carbon tax is unclear absent of legislative direction—difficult to evaluate
 - Options to minimize emissions leakage are unclear (include exemptions for trade exposed sectors, putting burden on other sectors for GHG reductions)
- ▣ May not achieve reductions beyond the known measures
- ▣ No clear path for international and subnational collaboration through linkages
- ▣ Potential for additional GHG reductions at covered entities
- ▣ Does not include an enforceable mandate as required by US EPA to reduce emissions at the stack - would need to identify other measures for compliance with CPP

Preliminary GHG Modeling Results

Draft Scoping Plan Scenario and Alternative 2



Next Steps: Economic Analysis

- ▣ Identify the structure of the carbon tax in Alternative 2
 - Collaboration with Economic Reviewers and stakeholders
- ▣ Continue to refine cost estimates
 - Capital costs
 - Incentives for retirement and replacement
- ▣ Address uncertainty in GHG reductions and costs
- ▣ Incorporate AB 197 requirements
- ▣ Analyze economic impact on Disadvantaged Communities
- ▣ Present modeling results in January for each scenario
 - GHG reductions, direct costs, and macroeconomic costs
 - Sensitivity analysis
 - Model documentation and public release

Role of Local Action

- ▣ Local governments are critical partners in State strategy
- ▣ Rate of reduction to achieve 2030 target requires an “all hands on deck” approach
- ▣ Many local governments are already leading climate efforts
 - Local Climate Action Plans
- ▣ Air district actions to reduce air pollutants also reduce GHGs

Recommended Local Plan Level Goals

- Community-wide goal of 6 MTCO₂e per capita by 2030 and 2 MTCO₂e per capita by 2050 implemented through Climate Action Plan
 - Consistent with statewide limits in AB 32, SB 32 and EO S-3-05
 - Consistent with Under 2 MOU “fair share”
 - Consistent with Paris Agreement
 - Demonstrates leadership role on climate change mitigation
- Per person approach allows for population growth in a more sustainable manner

Project Level GHG Goals (CEQA)

- Recommend projects to implement all feasible measures to reduce GHGs
 - Lead agency can develop numeric project level thresholds
 - Projects with emissions in excess of threshold, incorporate all feasible mitigation
 - Mitigation recommendation: onsite, in air basin, elsewhere

Next Steps

- Late November 2016: Release public discussion draft
- Early January 2017: Release full Draft Scoping Plan with all appendices, economic and environmental analyses, and new AB 197 estimates of GHGs, criteria and toxics by measure
- January Board Hearing on full Draft Scoping Plan
- First quarter 2017: Release final Scoping Plan
- Early 2017: Final Board consideration
- EJAC and Community Meetings
- Additional subject specific workshops