

Cap-and-Trade Program Workshop

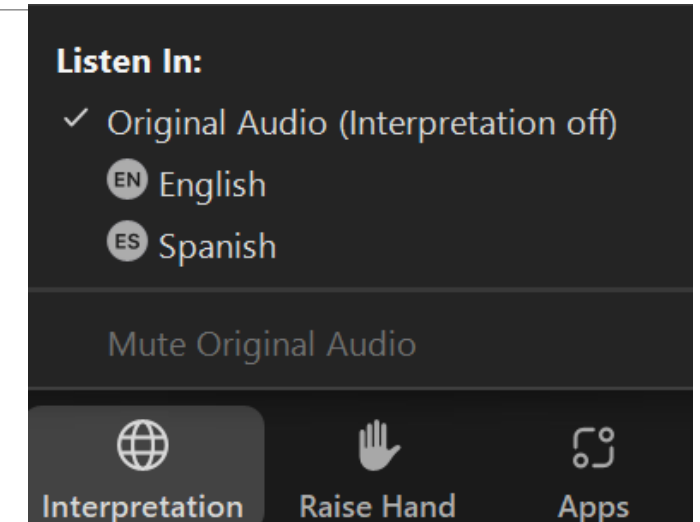
MAY 31, 2024



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Cap-and-Trade Program Workshop

MAY 31, 2024



Workshop Logistics

- Workshop materials and comment docket available at Cap-and-Trade Meetings and Workshops webpage
 - <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/cap-and-trade-meetings-workshops>
- Written feedback may be submitted to comment docket open through June 14 at 11:59 p.m. Pacific Time
- Public comment period after staff presentation
 1. Use the “Raise Hand” function in the toolbar at bottom of your screen
 2. When staff call your name, please “Unmute” and introduce yourself
 3. Commenters will be given 2 minutes. No ceding time to others.



Agenda

- Overview of potential Cap-and-Trade Program updates and budgets
- Utility allocation
- Industrial allocation
- Emissions coverage and specific emissions exemptions
- Mandatory Reporting Regulation (MRR) reporting requirements
- Public comment period

Potential Cap-and-Trade Program Updates and Budgets

California Context for Cap-and-Trade Program Updates

- **AB 1279:** Reduce anthropogenic GHG emissions by 85% below 1990 levels and achieve carbon neutrality by 2045
- **2022 Scoping Plan Update:** Indicated need to increase 2030 emissions reductions to support achievement of 2045 climate targets
- **Updated AB 32 GHG Emission Inventory:** Adjustment to align emissions from all sectors with third-party verified data
- Implementation needs and ongoing experience

Five Cap-and-Trade Program workshops and two community meetings held to develop and discuss concepts aligned with State goals

Initial Concepts for Potential Updates

- **Increasing Program stringency** and supporting a long-term carbon price signal aligned with the State's 2045 climate targets
- **Review market rules and cost-containment features** in the context of allowance budget adjustments to support liquidity, enhance market protections, and ensure transparent pricing
- **Account for evolution of electricity sector** in the Western U.S.
- **Updates to minimize emissions leakage** and continue to support decarbonization and innovation in California's industrial sector and fuels sector
- **Updates to offset credit provisions** and protocols to streamline implementation and reflect best available science

Initial Cumulative Allowance Budget Scenarios

million (M) allowances

Target	Adjusted Inventory Scenario		
	Estimated Total 2021-2045 Allowances*	Estimated Total 2021-2030 Allowances	Estimated Removal from 2021- 2030 Budgets
40%	4,125	2,490	115
48%	3,795	2,340	265
55%	3,505	2,215	390

* Post-2030 budgets decline linearly from a 2030 value that is consistent with emission reduction target for the scenario to the 2045 target (30.3 million allowances)

Standardized Regulatory Impact Assessment (SRIA) Overview

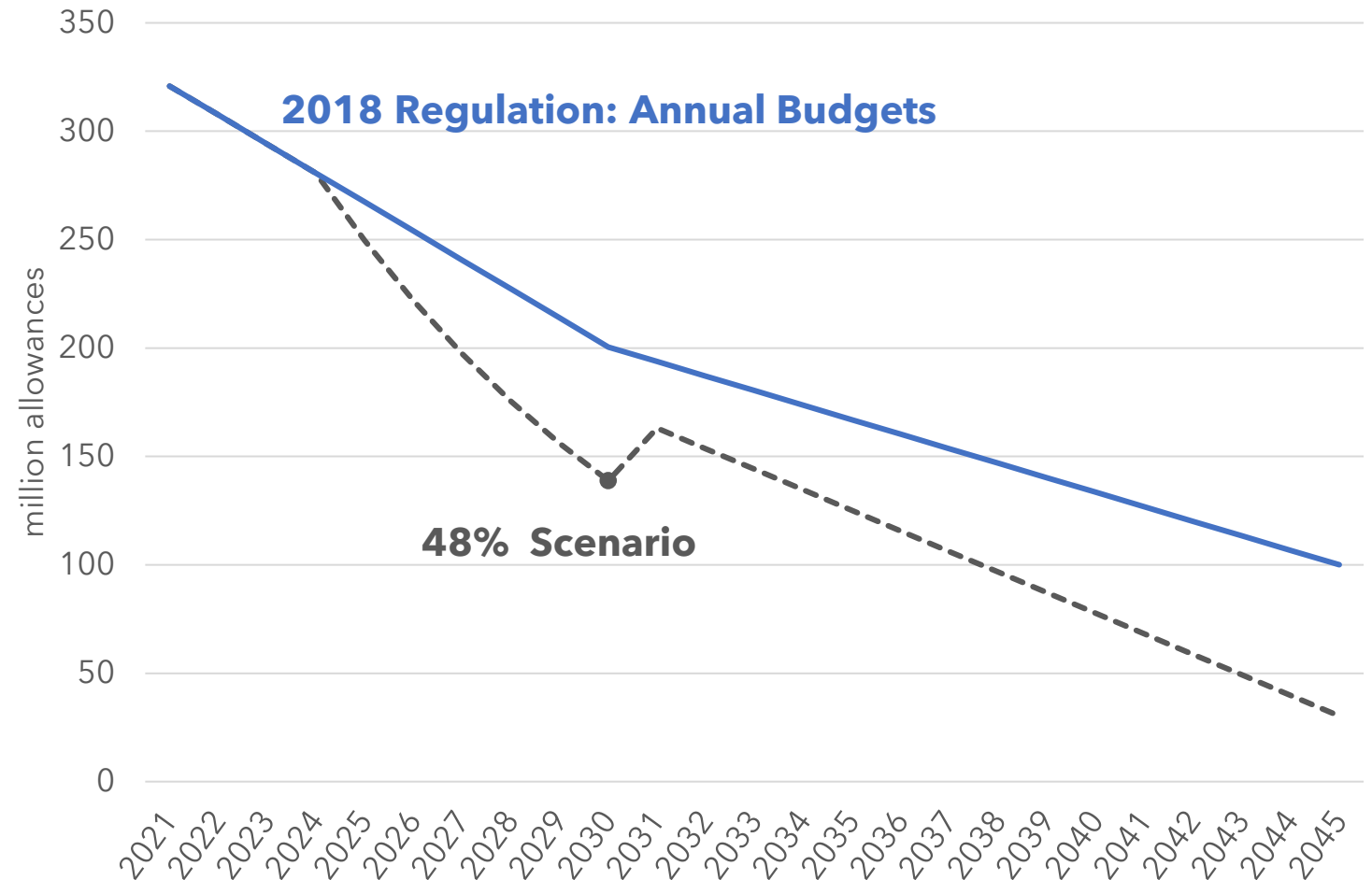
- Released April 9, 2024
- Initial economic evaluation of potential changes to the Program
 - Prepared using best information available
 - May not reflect precise real-world potential impact
- Not a formal staff proposal
- One of many steps CARB must take prior to updating the Regulation

SRIA estimated benefits relative to baseline (2025-2046)

	Proposed Scenarios	Alternative 1	Alternative 2
2030 GHG Reduction Target (compared to 1990 levels)	48%	40%	55%
GHG Emissions reductions (MMTCO ₂ e)	981	626	1,313
NOx reductions (short tons)	312,000	137,000	373,000
PM 2.5 reductions (short tons)	52,000	31,000	67,000

SRIA Allowance Budget for 2021-2045

- Achieves cumulative allowance removal by adjusting annual budgets for 2025-2030
- Post-2030 budgets decline linearly from a 2030 value that is consistent with emission reduction target
- Potential for increase in annual budget from 2030 to 2031 to impact post-2030 Program



Impact of Allowance Budget Changes on Cap Adjustment Factors (CAFs)

- Cap adjustment factors are calculated proportional to annual budgets
- Annual declines in annual budgets are reflected in proportional decreases in CAFs
- Currently the standard CAF decreases to 0.511 by 2030
- Changes to annual caps will lead to changes in CAFs
- Table shows Scenario B from SRIA as illustrative example

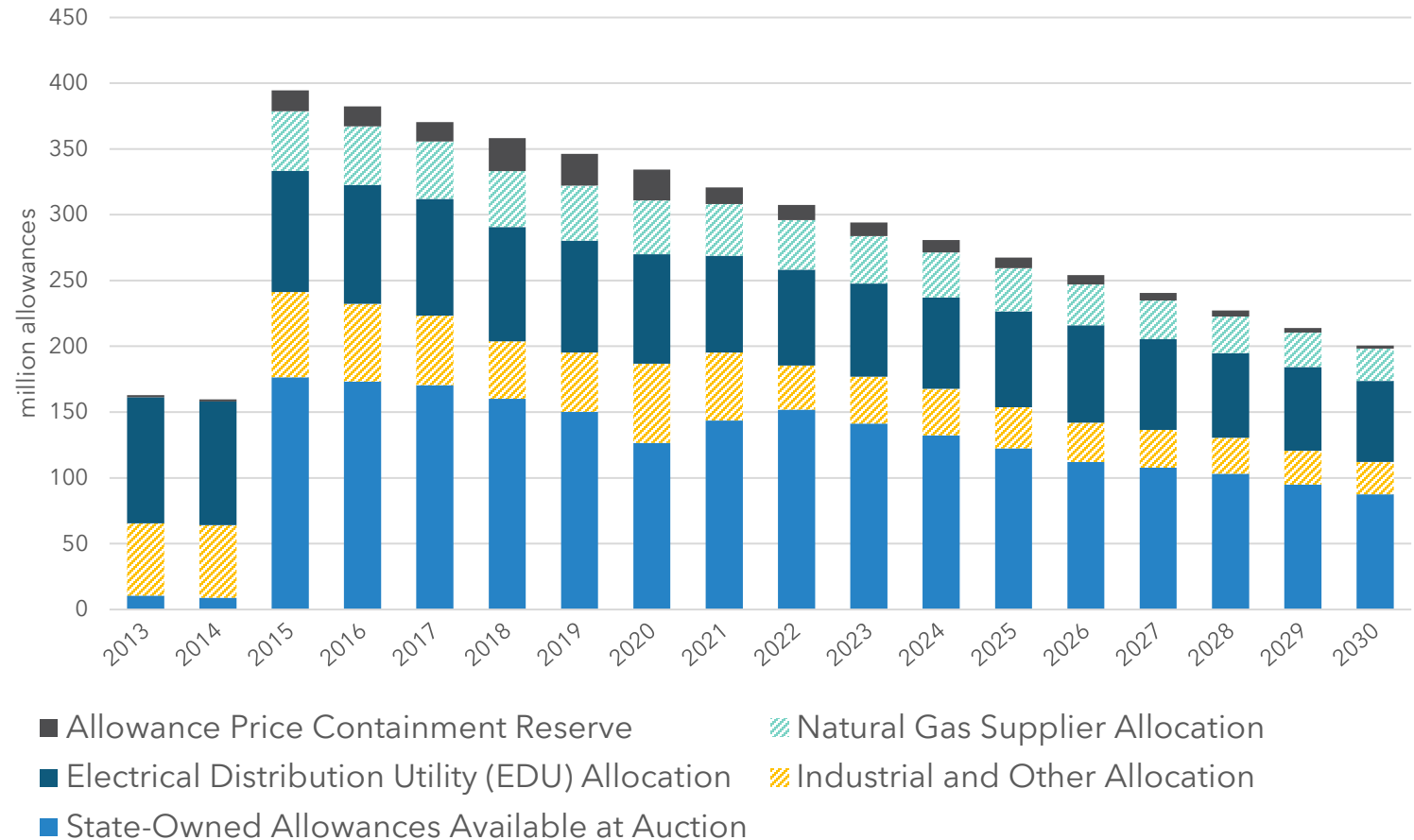
Illustrative Example of Standard Cap Adjustment Factors

Year	Current Regulation	Proposed Scenario B
2025	0.681	0.658
2026	0.647	0.605
2027	0.613	0.557
2028	0.579	0.513
2029	0.545	0.472
2030	0.511	0.434

Impact of CAFs on Allocation (1 of 2)

- CAFs scale allowance allocation (striped bars) to most entity types including
 - natural gas suppliers
 - industrial entities
 - universities
 - legacy contract generators
- Electrical distribution utility (EDU) allocation
 - not scaled by CAFs
 - determined by anticipated cost burden

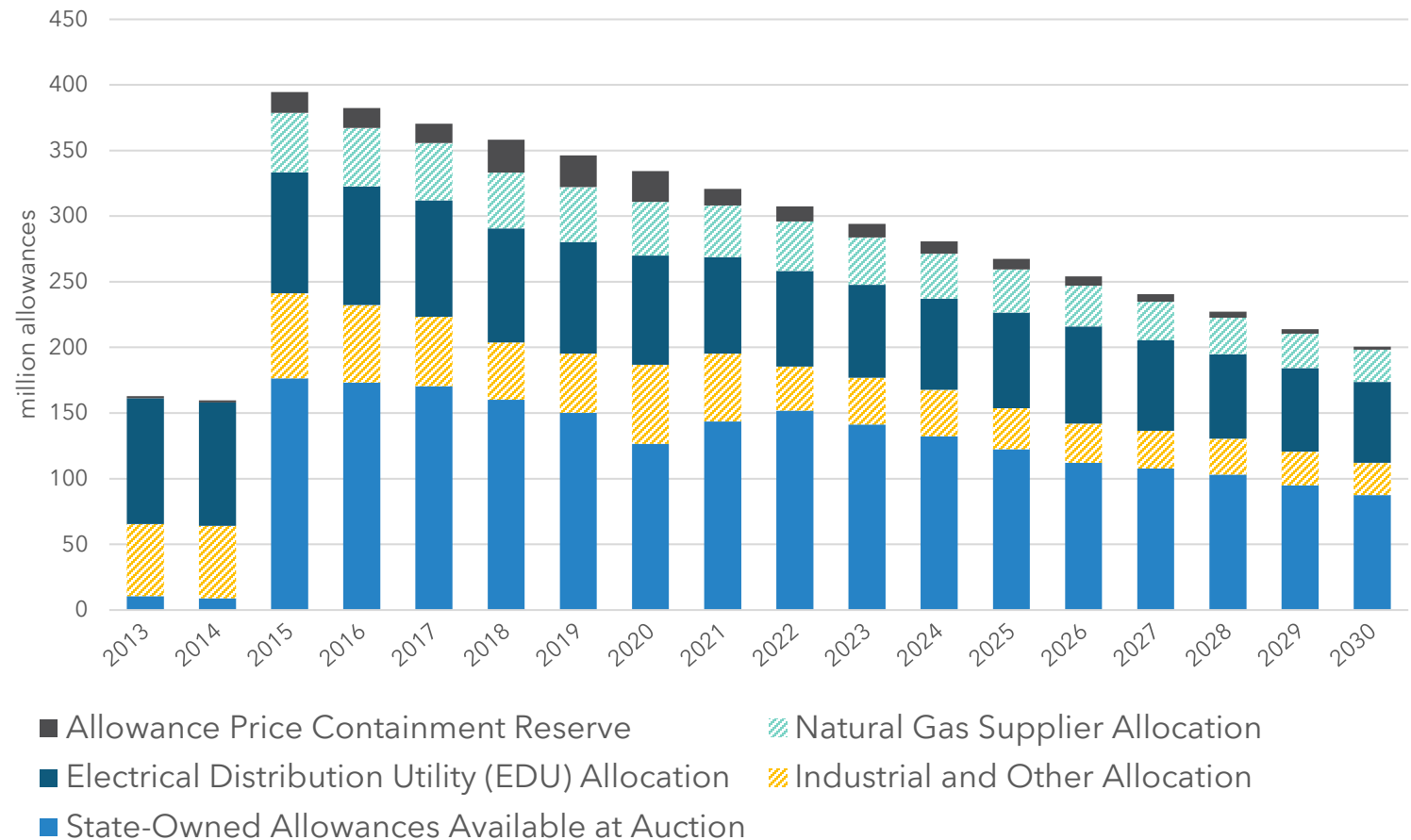
Estimated Budgets under Current Regulation



Impact of CAFs on Allocation (2 of 2)

- Allowances are distributed to the market by a variety of approaches to serve different purposes
- Scaling allocation by CAFs aligns reduction in allocation with overall cap decline
- EDU allocation declines due to increasing requirements to procure renewable and zero-carbon electricity

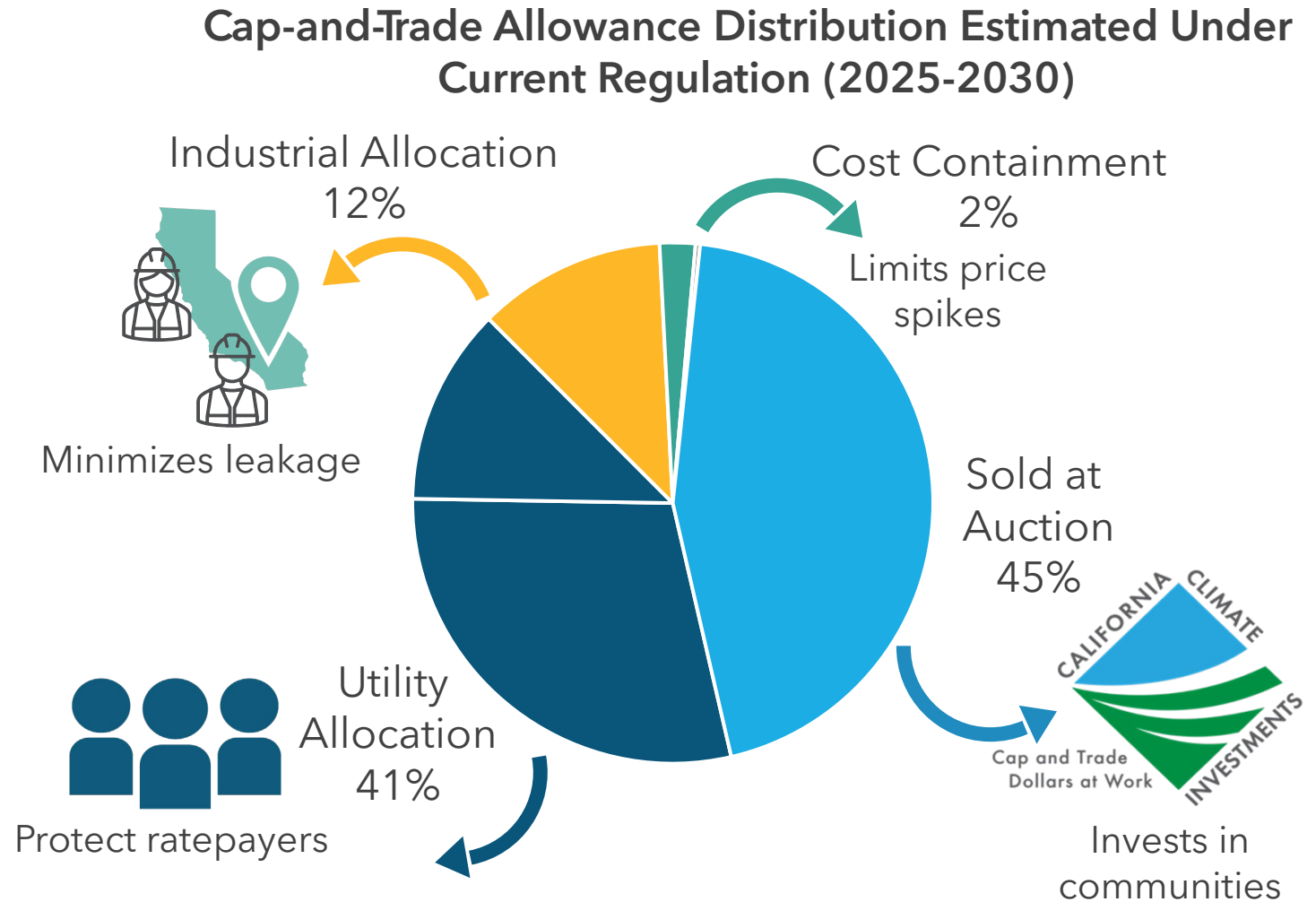
Estimated Budgets under Current Regulation



Cap-and-Trade Allowance Distribution

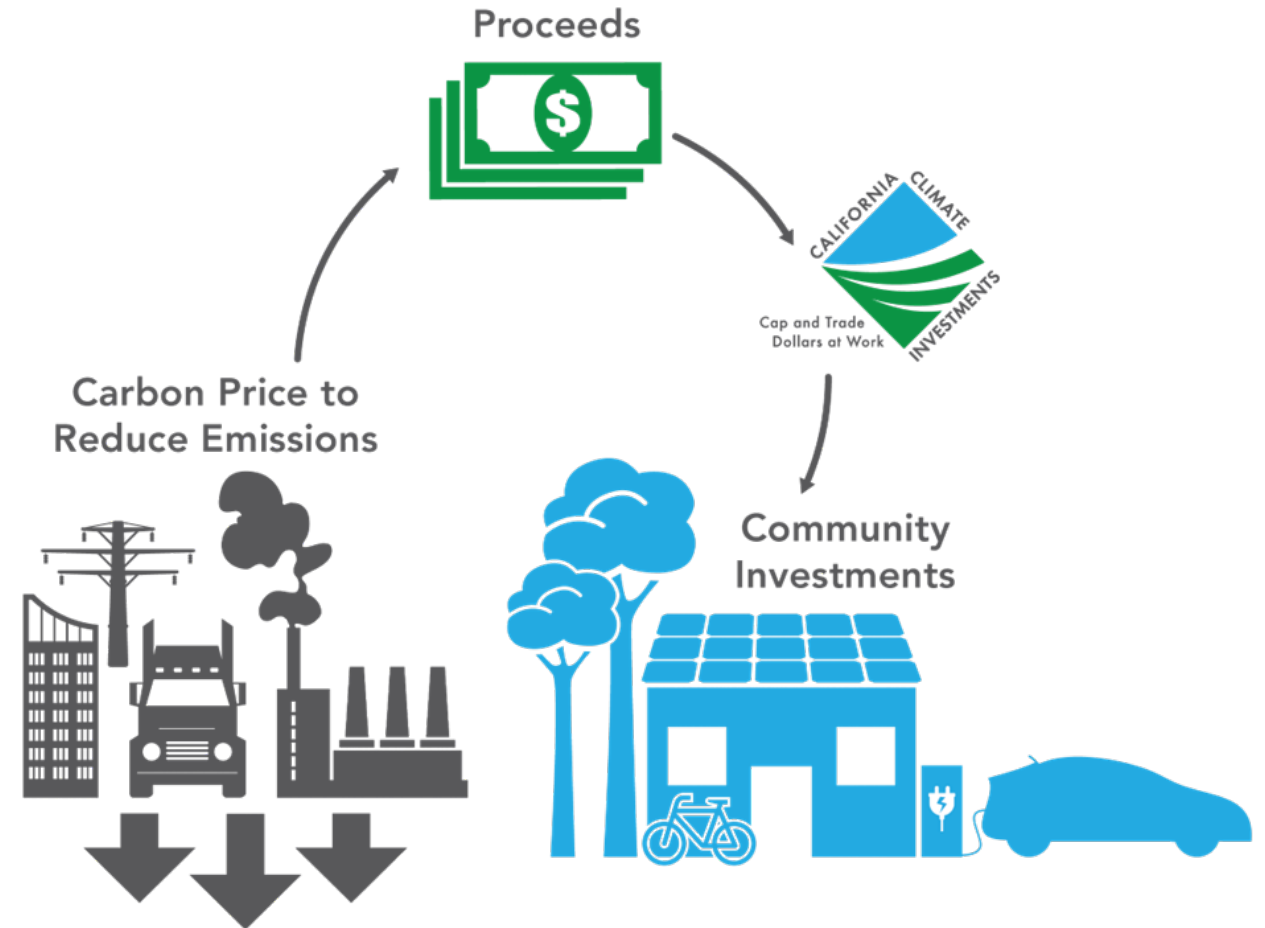
Allowance value distribution

- Sale at auction funds California Climate Investments and AB 617
- Free distribution to utilities for rate payer protection
- Free distribution to industry to minimize leakage where production leaves the state



Cap-and-Trade Program Critical Funding for Equity

- Auction of State allowances solely fund California Climate Investments and funds AB 617 Community Air Protection Program
- \$27B raised; \$11B implemented (through November 2023)
- Over 76% implemented benefiting priority populations
- Projects will reduce 109 million metric tons CO₂e, 106 thousand tons of criteria air pollutants

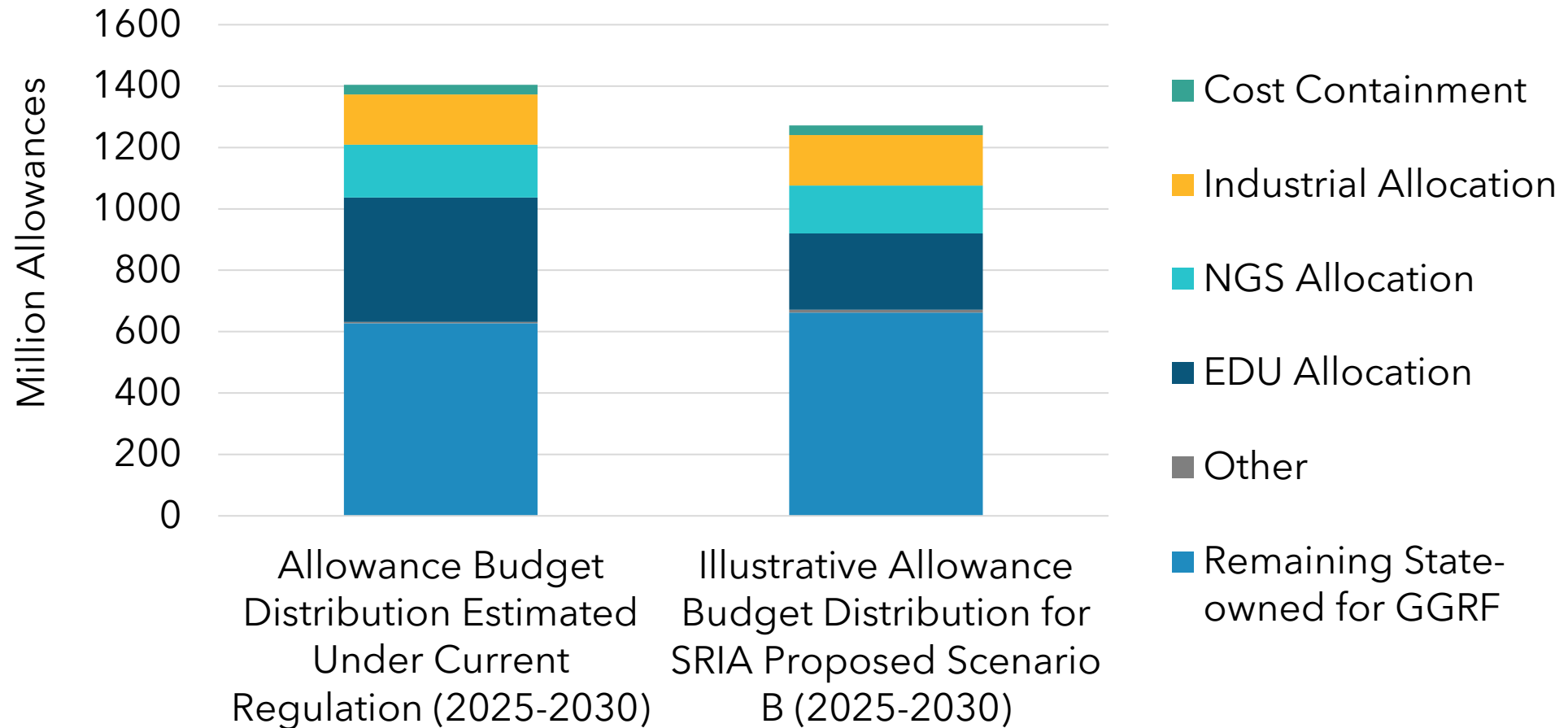


Utility Allocation and Use of Allowance Value

Utility Allocation Background

- CARB allocates allowances to electrical distribution utilities (EDU) and natural gas suppliers (NGS) for the protection and benefit of ratepayers
- EDU allocation (Table 9-4 adopted in 2016 rulemaking) is based on the estimated cost of compliance with the Program
- NGS allocation is based on 2011 covered emissions and declines each year in proportion to the overall Program allowance budgets
 - All NGS are required to consign a minimum percentage of their allocated allowances to auction, which increases 5% per year and reaches 100% in 2030
 - The 2022 Scoping Plan Update projects broad deployment of zero-carbon electricity and electrification of residential and commercial customers

Estimated Distribution of Allowance Budgets



Utility Allocation: Feedback

- Is the current EDU and NGS allocation sufficiently aligned to promoted state electrification goals?
- How should EDU and NGS allocation be set post-2030 given decreasing Program allowance budgets?

EDU and NGS Use of Allowance Value: Background

- Most EDU and NGS allowances are consigned to auction, and the auction proceeds must be spent on either non-volumetric return to ratepayers (e.g., the California Climate Credit) or projects that reduce GHG emissions
- For natural gas suppliers, a broad range of potential GHG reduction projects are eligible under the provision for “Other GHG Emission Reduction Activities”
 - Previously reported uses include incentives for building electrification, new efficient appliances, and biomethane pipeline interconnection

EDU and NGS Use of Allowance Value

- GHG reduction activities must benefit ratepayers in the utility's service territory
- Prohibited uses of allowance value include regulatory compliance costs, lobbying costs, employee bonuses, shareholder dividends, and volumetric return to ratepayers

Goals:

- For uses outside of climate credits, ensure that allowance value is used for GHG reduction activities
- For natural gas suppliers, eligible uses of allowance value for GHG reduction should align with decarbonization measures in the 2022 Scoping Plan Update

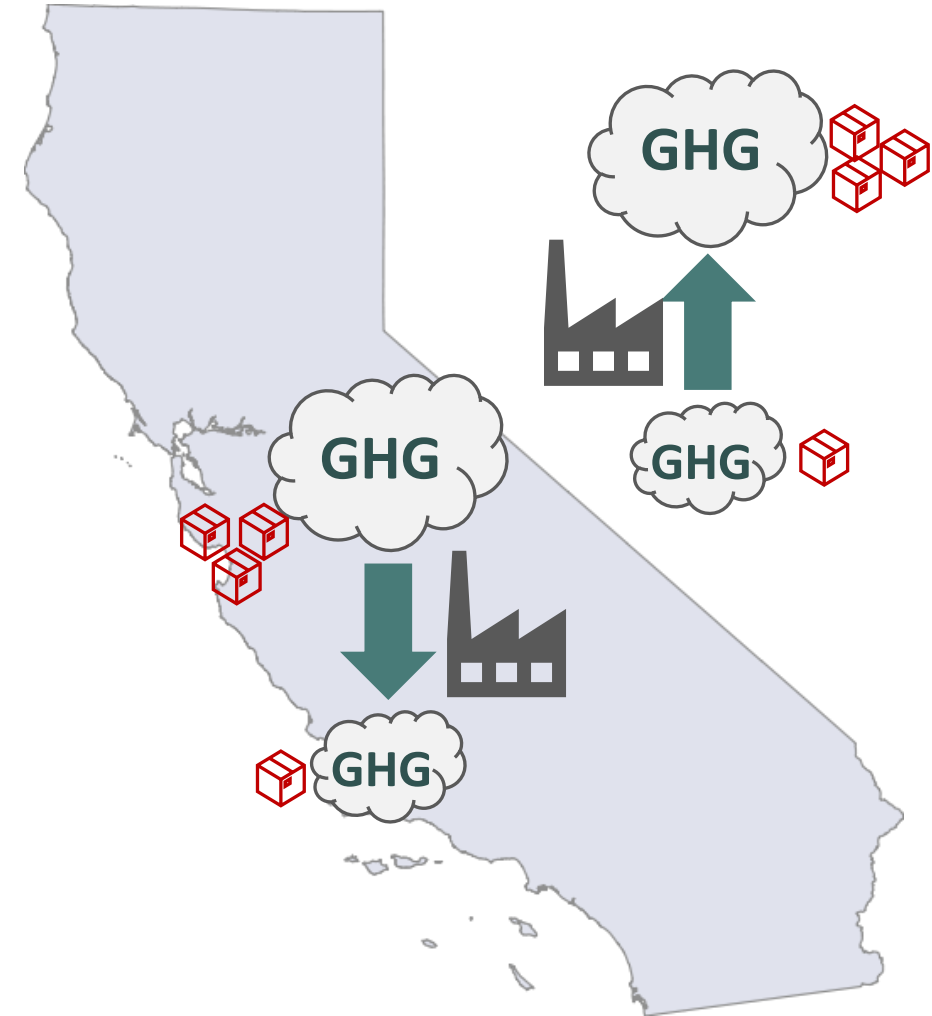
EDU and NGS Use of Allowance Value: Feedback

- Should CARB revisit the use of allowance value by NGS?
- Should there be any additional limitations on the types of GHG reduction projects that can be funded with EDU or NGS allocated allowance value?

Industrial Allowance Allocation

Industrial Allocation: Background

- AB 32 requires CARB to minimize emissions leakage
- Leakage risk is addressed by direct allocation to covered industrial entities
- Most industrial leakage allocation is calculated using output-based method
 - Facility output multiplied by product benchmark and scaled by the cap adjustment factor and assistance factor
- Staff is evaluating industrial allocation given mid-century decarbonization targets, evolution of industrial sectors, and implementation experience.



“One-Product One-Benchmark” Principle for Industrial Allocation

- Since Program inception, output-based industrial allocation has relied on the “one-product one-benchmark” principle:
 - Avoid product benchmarks and definitions differentiated by technology, fuel mix, size, age, climatic circumstances, or raw material quality of the installations producing the product
- Advantages of the one-product one-benchmark approach:
 - Appropriately rewards relatively low-GHG production within a sector
 - Ensures all GHG emissions abatement options remain viable and receive consistent incentives, including switches to different technologies, fuels, and feedstocks
 - Provides consistent treatment to all facilities for production of a specified product

California’s industrial sectors are evolving and will continue to transform as facilities seek to reduce emissions, employ innovative low-GHG production methods, and shift production to new low-carbon fuels and materials needed for the decarbonization of California’s broader economy.

Cement Sector Allocation: Background

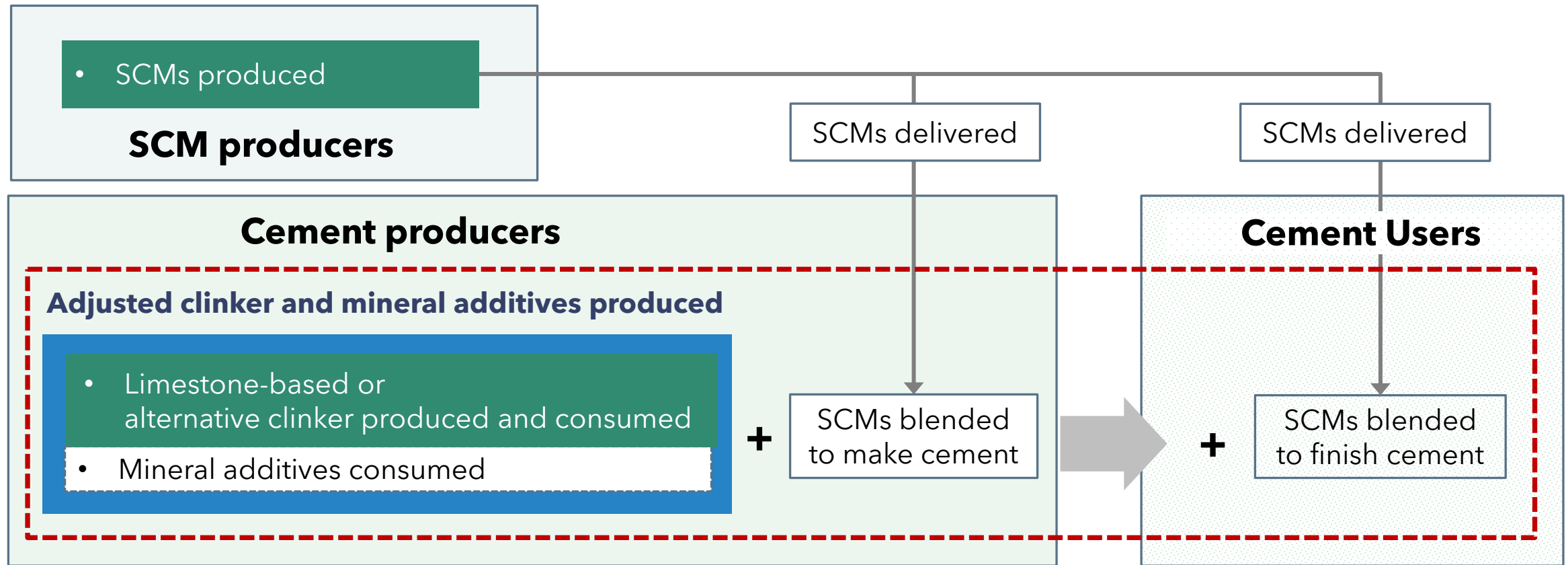
- Current cement production and allocation framework
 - Clinker is the largest source of GHG emissions during cement production
 - Clinker produced at cement plants is blended with gypsum, limestone, and additives, then shipped to cement users, such as concrete plants, that may add supplementary cementitious materials (SCMs) to finish cement
 - Currently, “adjusted clinker and mineral additives (gypsum and limestone) produced” by incumbent cement plants is eligible for allowance allocation
- Increasing amounts of low-carbon alternative materials are being added to decarbonize cement and to make new types of cements

Goals

- Treat alternative materials the same as conventional cement if it is produced in California and meets equivalent performance requirements
- Adjust allowance allocation for the cement sector to accommodate alternative materials

Cement Allocation: Initial Concept (1 of 2)

- Pathways to finished cement



"Finished cement" eligible for cement allocation

Cement Allocation: Initial Concept (2 of 2)

- Existing framework
 - Product definition: “Adjusted clinker and mineral additives produced”
- Initial concept for new framework
 - Update “adjusted clinker and mineral additives produced” to include both limestone-based clinker and low-carbon alternative clinker that satisfies equivalent performance requirements as limestone-based clinker
 - Product definition: “Finished cement,” which is the sum of “adjusted clinker and mineral additives produced” and SCMs blended to finish cement
- Incumbent cement producers, alternative cement producers, and SCM producers all produce components of finished cement
 - Such entities operating in California could potentially opt-in to the Program, if not covered, to receive allowance allocation for producing “finished cement”

Cement Sector Allocation: Feedback

- Should alternative clinker and SCMs be eligible for allocation under the cement allocation framework?
 - How should the definitions of “cement” and “adjusted clinker and mineral additives produced” be modified?
 - What NAICS codes reflect industrial production of the range of materials that are under consideration?
- If SCMs are eligible for allocation, who should receive allocation?
 - Should it be SCM producers or cement plants? Why?
 - For SCMs, is it feasible for one party to report verifiable information on the amount of SCMs shipped from SCM producers and received by users to make cement? Would multiple parties need to report to ensure accuracy?

Crude Oil Extraction: Background

- Initial 2010 Rulemaking diverted from “one-product one-benchmark” approach for crude oil extraction
 - Thermal benchmark: 0.0811 MTCO₂e/BOE
 - Non-thermal benchmark: 0.0076 MTCO₂e/BOE
- Since 2012, Cap-and-Trade and MRR implementation and data indicate
 - Crude oil extraction is not clearly bimodal in practice or in emissions intensity
 - The complexity of oil field operations and geology may contribute to inconsistent reporting and verification of “thermal production”
- See [July 27, 2023 workshop](#) for initial discussion of California crude oil extraction and benchmarks

Crude Oil Extraction: Initial Concept

- Starting with vintage 2031, allocate for crude oil extraction using a newly calculated single benchmark for produced barrel of oil equivalent
- Calculate the new benchmark using the same aggregated California oil producer data as the existing thermal and non-thermal benchmarks, providing a similar level of overall leakage protection to the sector
- Approach is technology-agnostic, aligns with the one-product one-benchmark principle.

Feedback

- Should the allocation for crude oil extraction be aligned with the “one-product one-benchmark” principle?

Transportation Fuel Production: Background

- 2022 Scoping Plan lays out path to decrease petroleum fuel demand by 94% by 2045
- Ongoing demand for transportation fuels from legacy on-road, aviation, and off-road
- In-state production of biogenic transportation fuels from converted petroleum refineries is already occurring
- Renewable diesel is a drop-in hydrocarbon fuel, functionally equivalent to petroleum diesel, but derived from biogenic rather than fossil feedstocks
- See [July 27, 2023 workshop](#) for initial discussion of biogenic and petroleum transportation fuel production and allocation

Transportation Fuel Production: Allocation Background

- Petroleum refineries receive allocation for the activity of “petroleum refining” using complexity weighted barrel (CWB) as the output metric
- CWB benchmark, as a technology-specific approach, is difficult to extend to biogenic fuel producers
- Current allocation provisions are not well-positioned to allocate for biogenic fuel production, particularly to facilities that also produce hydrogen
- Maintaining the current CWB method long-term for petroleum refining, while allocating to other facilities producing functionally equivalent fuels with process- or feedstock-specific benchmarks, may provide inconsistent treatment across the transportation fuel production sector and inconsistent incentives for low-GHG production

Transportation Fuel Production: Initial Concept

- Allocate to transportation fuel producers using a "liquid hydrocarbon fuel" framework based on the total production of motor gasoline blendstocks, diesel, jet fuel, finished hydrocarbon gas liquids, and any functionally equivalent non-fossil hydrocarbon fuels or blending components
- Phased-in approach
 - Allocation for "liquid hydrocarbon fuel" production immediately available to facilities producing 100% biogenic fuels
 - Petroleum refineries may receive allocation based on CWB through vintage 2030
 - Starting with vintage 2031, all applicable transportation fuels producers allocated based on "liquid hydrocarbon fuel" production
- Develop new "liquid hydrocarbon fuel" benchmark using existing high-quality MRR data reported by covered facilities
- Allocate for production of asphalt production under a separate benchmark

Transportation Fuel Production: Initial Concept Outcomes

- This “liquid hydrocarbon fuel” approach would be technology-agnostic, align with the one-product one-benchmark principle, reward low-GHG production and investments within California, and provide consistent treatment of all entities within the sector
- “Liquid hydrocarbon fuel” framework provides a similar level of leakage risk protection to the petroleum refining sector as the current CWB approach, while strengthening incentives for low-GHG production
- Enables near-term allocation, after amendments are effective, for biogenic fuel production using a benchmark based on high-quality California data
- Enables a consistent long-term allocation approach for petroleum refineries, biogenic fuel producers, co-processing facilities, and emerging fuel production methods

Transportation Fuel Proposal: Feedback

- What products should or should not be included under a potential “liquid hydrocarbon fuel” framework?
- Do applicable facilities have significant production of any finished products that may not be included in a “liquid hydrocarbon fuel” framework?
- Are there existing reporting methods (State or Federal programs) that could support MRR reporting and verification of produced fuels?
- How should facilities engaged in production of both biogenic and fossil transportation fuels be allocated to during any “phase-in” period?
- Should petroleum refineries be able to transition early to allocation based on “liquid hydrocarbon fuel” production?

Emission-Intensive Trade-Exposed (EITE) Electricity Allocation

- Per [July 2023 workshop](#) (slides 48-50), staff is evaluating completing transfer of the responsibility for providing leakage protection to industrial entities for carbon costs in electricity from CPUC to CARB
 - For IOU customers, an administrative change only with no change leakage protection
 - For POU customers, providing the same leakage protection as IOU customers
 - Calculation method would continue to mirror current industrial allocation
- To implement, CARB would publish electricity efficiency benchmarks in the Regulation
 - Benchmarks use the same facility data and data years as used to develop all benchmarks currently published in Table 9-1
 - **Goal:** Provide the same level of transparency for the electricity allocation process as for industrial allocation for direct emissions

Emissions Coverage

Coverage of Emissions from Fuel Ethanol Denaturant

- All fuel ethanol blended in transportation fuels contains a specified concentration of fossil fuel denaturant
- Currently, all fuel ethanol supplied by transportation fuel suppliers is reported as 100% biogenic ethanol, and all associated CO₂ emissions are exempt under Cap-and-Trade
- Initial concept
 - Amend MRR so that supplied fuel ethanol appropriately accounts for the volume of fossil fuel denaturant
 - Remove the Cap-and-Trade exemption for ethanol fossil denaturant CO₂ emissions

Feedback

- Should fuel ethanol be reported as 2.5% fossil denaturant by default, consistent with U.S. federal limits on denaturants and denatured fuel ethanol, or should more specific reporting on denaturant content be required?

Coverage of Emissions from Fuel Cells

- Board Resolution 18-51 directed staff to propose an exemption through 2030 for fuel cells connected to existing natural gas infrastructure where there are demonstrated local air quality benefits

Feedback

- How could an exemption be applied?
 - Exempt facilities whose fuel cell emissions cause facility's total emissions to exceed the emissions threshold? Other approach?
 - Should a fuel cell exemption be linked to existing standards, such as the Stationary Fuel Cell Net Energy Metering Standard?
 - Not allow exemptions where fossil gas is utilized?

Coverage of Emissions from Electricity Generation During an Emergency

- Extreme heat events can strain the State's electricity infrastructure and overwhelm the power supply. During recent extreme heat events the Governor has proclaimed a State of Emergency, called for a temporary increase in energy production to support grid reliability, and temporarily suspended permitting requirements (Executive Order N-14-22)
- Consistent with the EO, staff is evaluating whether emissions generated during a state of emergency by an electricity generating facility that, but for these emissions, would not be covered by the Program, should be excluded when assessing whether a facility exceeds the Program inclusion threshold

Feedback

- Should CARB consider this type of exemption for emergency generation aligned with the overall requirements in EO N-14-22 ?

Mandatory Greenhouse Gas Emissions Reporting (MRR) Requirements

Non-Fossil Transportation Fuels: MRR Background

- MRR point of regulation (POR) for transportation fuel suppliers is refiners, position holders at terminal racks, and enterers that import fossil fuels outside the bulk transfer system
- POR does not fully capture non-fossil transportation fuels supplied outside the bulk transfer system, particularly biodiesel
- MRR does not regulate novel non-fossil transportation fuels

Objectives

- Completely and accurately capture emissions associated with non-fossil transportation fuels
- Collect data to assess if non-fossil transportation fuels are being fully and accurately reported

Non-Fossil Transportation Fuels: MRR Initial Concept

- Add enterers of non-fossil fuels and in-state non-fossil producers supplying outside of bulk terminal to transportation fuel supplier POR
- Add data reporting requirements for non-fossil fuel volumes subject to MRR emissions reporting
- Add non-fossil motor gasoline blendstock and non-fossil liquefied petroleum gas (LPG) as regulated transportation fuels

Feedback

- Do importers and in-state producers of non-fossil transportation fuels anticipate difficulties with determining/documenting the volume of non-fossil fuels delivered outside of the bulk system?

Importers of Fuel: MRR Background

- Importer of Fuel (IOF) definition establishes point of regulation (POR) for importers of liquefied petroleum gas (LPG), liquefied natural gas (LNG), and compressed natural gas (CNG)
- LPG importers having difficulty determining if they are the IOF for domestic imports, especially imports from storage facilities
- MRR reporting threshold for IOF is 10,000 MTCO₂e per year

Objectives

- Simplify reporting and provide flexibility to LPG importers while continuing to comprehensively capture emissions from LPG in California

Importers of Fuel: MRR Initial Concept

- Revise IOF definition to mean the owner of LPG, CNG, or LNG as it enters California
- Change annual reporting threshold for importers of LPG from 10,000 MTCO_{2e} to 100,800 gallons of imported LPG (~3 railcars, 587 MTCO_{2e})
- No change proposed to threshold for LNG/CNG importers

Feedback

- Importers of LPG: Will proposed threshold capture most LPG imports into CA? What are incentives and disincentives for current reporters to retain the obligation to report?
- Importers of LNG or CNG: Any impacts due to revised IOF definition?

Renewable Hydrogen: MRR Initial Concept

- Currently hydrogen production facilities that emit $\geq 10,000$ MTCO₂e per year report to MRR (all production is via steam methane reformation)
 - Subject to Cap-and-Trade if $\geq 25,000$ MTCO₂e per year
- Considering expanding reporting for hydrogen fuel production
 - Per 2022 Scoping Plan, renewable hydrogen production needs to increase 1700x by 2045
 - Federal incentives (45V tax credit) support growth of renewable hydrogen production

Feedback

- Seeking input on additional reporting requirements for
 - In-state electrolytic hydrogen production
 - Biomass/biogas-based hydrogen production
 - Additional hydrogen production methods with emissions below the MRR threshold
 - Hydrogen imports

Natural Gas Infrastructure Emissions Reporting

- Vented emissions from natural gas transmission pipelines are not currently reported to MRR; this category was incorporated into U.S. GHG EPA reporting in 2014
- Fugitive and vented emissions reported by a local distribution company under 95152(e) and 95152(i) do not incur a compliance obligation due to uncertainty in overlap between fugitive and vented emission sources and natural gas reported as supplied by a natural gas supplier

Initial Concept and Feedback

- Incorporate blowdown emissions reporting for transmission pipeline into MRR, aligned with 2023 U.S. EPA reporting
- How do reporting entities determine emissions from pipeline dig-ins?
- Are any emissions sources reported under section 95152 also captured in emissions reported by natural gas suppliers under section 95122? If so, which ones, and to what extent?

Cement Importers: MRR Background

- AB 398 requires CARB to evaluate the potential for a border carbon adjustment to mitigate leakage
- In-state cement sector has been covered by MRR since 2008
- For imported cement, there are no reporting requirements under MRR
Cement is a GHG emissions-intensive product with a relatively small number of importers
 - Currently five cement importers operate 13 terminals in California
 - Over 2 million MT of cement were imported into California in 2021
 - 10 million MT of cement produced in California in 2021

Cement Importers: MRR Initial Concept

- Include cement importers to report to MRR
- Given the complexity of assessing GHG emissions associated with products not manufactured in California, start with a “transitional” period during which reported data is not subject to verification
- During transitional period, cement importers report GHG emissions intensity and the amount of imported cement using best available quantification methodologies

Cement Importer Reporting: Feedback

- Who should be required to report imported cement data to MRR?
 - Operators of cement import terminals
- What kinds of reporting methodologies could be allowed during a transitional period?
 - MRR methodologies
 - Other methodologies reasonably comparable to MRR
 - Default emissions factors if no GHG emissions data are available
- Which products or materials should be reported? Could imported cement reporting could be disaggregated by component materials?
 - Clinker, alternative clinker, gypsum, limestone, and SCMs
- Should verification be initially required or phased in?

Questions and Feedback Session: Industrial decarbonization and allocation and emissions exemptions

- Public Comment Instructions



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Additional Program Evaluations

- Cap-and-Trade FAQ & Local Air Pollution
<https://ww2.arb.ca.gov/resources/documents/faq-cap-and-trade-program>
- Allowance Supply Evaluation
[BR 18-51 Cap-and-Trade Allowance Report](#)
- Recent Forest Offset Program Review
[nc-CARBslides20221130.pdf](#)
- Cap-and-Trade Website
[Cap-and-Trade Program | California Air Resources Board](#)

Next Steps

- Submit written feedback through 11:59 p.m. on June 14
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