Elevate Climate (Alicia Robinson)

California Carbon Market Collaborative Comments

California Carbon
Market Collaborative

March 9, 2025

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: California Carbon Market Collaborative Comments on the Proposed Amendments to the Cap-and-Invest Regulation

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide comments on the proposed amendments to the Cap-and-Invest Program. As stated throughout our informal comment period letters (appended hereto), the CCMC continues to support leaning on the Cap-and-Invest Program as the state's primary tool for meeting ambitious climate targets and ensuring California remains on track to achieve its long-term climate goals.

The CCMC believes that the Cap-and-Invest Program is uniquely positioned among the state's suite of climate policies to lead the achievement of ambitious climate targets because it improves emissions certainty, aligns economic incentives, generates revenue for investment into California, and can contribute to lowering local air emissions (See August 2023 Comment Letter).

Leaning on the program to achieve emissions certainty is more important now than ever, as funding constraints and implementation delays are increasingly threatening underperformance of other California climate policies. The Cap-and-Invest Program is unique among California's climate tools because it is capable of ramping up abatement in real time if other policies fall short. In this context, the Program offers critical reassurance by reducing uncertainty in overall emissions outcomes and strengthening confidence in meeting statewide climate targets. Consistent with previous letters, the CCMC makes recommendations to increase ambition, improve equity, and protect affordability, especially as it pertains to utility bills.

1. **Increasing Ambition**

    a. **The CCMC encourages CARB to increase the number of near-term allowance removals from 2027-2030 Budgets.**

The CCMC commends CARB for proposing a significant reduction in cumulative allowance supply through 2045. The Staff Proposal would remove approximately one billion allowances from budgets through 2045, resulting in roughly 2.1 billion allowances cumulatively from 2027 to 2045, instead of approximately 3.1 billion allowances over the same period. This cumulative reduction is broadly consistent with reductions CARB estimated were necessary to align the Program with California's 2045 climate target.

With respect to California's 2030 climate target, the CCMC has consistently supported aligning program caps with the 48 percent emissions reduction target identified in the 2022 Scoping Plan as the level of ambition needed by 2030 to remain on track for California's 2045 goals under AB 1279. CARB's 2024 Standardized Regulatory Impact Assessment estimated that achieving this target would require removing roughly 265 million allowances from pre-2031 budgets.

The Staff Proposal instead aligns caps with SB 32's 40 percent by 2030 target, citing legislative direction in AB 1207, and proposes removing 118 million allowances from 2027–2030 budgets. This leaves a shortfall of approximately 146 million allowances relative to the 48 percent target, which staff propose to remove after 2030. Moreover, most of the proposed removal of 118 million allowances occurs in later years of the 2027–2030 period.

Both deferring 146 million allowances to post-2030 budgets and backloading the 2027-2030 removals results in delayed climate ambition, which has direct consequences for near-term emissions reductions and cumulative climate impacts. Early emissions reductions deliver disproportionate climate and economic benefits by lowering cumulative greenhouse gas concentrations, reducing the risk of near-term climate damages, and easing the scale of reductions required in later years.

Frontloading abatement also strengthens investment signals for clean technologies, accelerates infrastructure deployment, and allows regulated entities to spread compliance costs more smoothly over time. By contrast, delaying reductions increases reliance on steeper future cuts, raises long-run compliance costs, and heightens the risk of disruptive policy adjustments.

We strongly encourage CARB to consider removing a greater number of allowances from 2027 and 2028 budget years than currently reflected in Table 6-2 of the Amended Regulation. Doing so will provide a critical opportunity for earlier emissions reductions and mitigate the impacts of delayed ambition described above.

b. The CCMC encourages CARB to consider implementing the "Offsets Under the Cap" (OUTC) mechanism one year earlier than proposed.

Implementing OUTC one year earlier than proposed would better align with AB 1207's urgency clause and would achieve additional near-term emissions reductions.

Under the revised approach, by December 8, 2026 (rather than December 8, 2027), CARB would transfer allowances into the Allowance Removal for Offset Use Account equal to the total covered emissions reported and verified in MRR for 2025, multiplied by the applicable quantitative usage limit for compliance offsets.

Under the current proposal, the offset usage limit is pegged to the verified emissions year (4 percent in 2025). The CCMC encourages CARB to consider whether to retain this approach or instead peg the offset usage limit to the budget year from which allowances are removed, which could better align removals with the applicable allowance budget.

The CCMC believes that implementing OUTC one year earlier is also consistent with the principle of non-retroactivity. The revised approach relies on 2025 reported and verified emissions solely to produce the most accurate and reliable estimate of emissions for purposes of calculating the number of allowances associated with the offset usage limit. It uses historical emissions data only as an input into a forward-looking calculation and does not impose new requirements, alter compliance obligations, or modify regulatory treatment for any past compliance period. Finally, the proposed approach would not be inconsistent with the regulations going into effect in September 2026.

c. The CCMC encourages CARB to clarify certain provisions regarding the implementation of offsets under the cap.

The CCMC encourages CARB to define "Issuance Account" and "Allowance Removal for Offset Use Account" to support stakeholders' understanding of the mechanics, purpose, and administration of these accounts. "Issuance Account" and "Allowance Removal for Offset Use

Account" are capitalized terms in the Amended Regulation but do not currently have accompanying definitions, unlike other capitalized terms in the regulation.

The CCMC further encourages CARB to specify, either in the definitions section or in the final Regulation, the source of allowances that will be placed in the Issuance Account and the Allowance Removal for Offset Use Account. While the Staff Proposal indicates that allowances will be removed "solely from the auction and allocation accounts," additional clarity is warranted regarding whether allowances associated with offset usage will be sourced from the auction pool, the allocation pool, or a combination of both.

The CCMC further encourages CARB to source allowances for Allowance Removal for Offset Use Account from the auctioned pool of allowances. The CCMC believes this approach is both administratively practical and consistent with legislative intent.

2. Protecting Affordability and Improving Equity

a. The CCMC recommends that CARB clarify CCUS provisions in the proposed amendments to better incentivize early deployment of this technology

The proposed amendments provide that a "Board-approved quantification methodology must be incorporated into the Cap-and-Invest Regulation before it can be used to reduce a CO_2 supplier's compliance obligation." However, the amendments do not define the standards, procedural mechanism, or timeline for such "incorporation." This omission creates material regulatory uncertainty that can and should be addressed in this rulemaking.

This uncertainty risks delaying investment and undermining incentives for early deployment, as stakeholders lack clarity on when CCUS reductions may be eligible for compliance use. To address this ambiguity, CARB could, for instance, more clearly articulate the mechanism, timing, and criteria for incorporating Board-approved quantification methodologies into the Cap-and-Invest Regulation. CARB could also detail the accounting framework that would be used to recognize CCUS reductions when determining an entity's compliance obligation.

Given the delays to SB 905 implementation and the importance of this cap-and-invest regulatory update, CCMC believes stakeholders would benefit from a clearer understanding of CARB's envisioned approach sooner than later. CARB could help provide this clarity by previewing a predictable compliance pathway for early CCUS projects without undermining the program's environmental integrity while SB 905 implementation process is being completed.

b. The CCMC believes that continuing to protect ratepayers is critical, especially as the program becomes more ambitious.

The California Climate Credit is a central pillar of the Cap-and-Invest Program's affordability framework and is the single most direct way that the program currently has for returning auction value to Californians. The Climate Credit is also an essential tool for offsetting program-related costs for energy ratepayers, particularly for low-income and disadvantaged households that spend a larger share of their income on electricity and natural gas bills. As program ambition increases in line with California's climate targets, it will be important to ensure utility allocation continues to effectively support ratepayers.

The California Climate Credit depends on continued free allocation to electric utilities and, in the short term, to natural gas suppliers. In practice, the majority of allowance value allocated to utilities flows directly to households through the climate credit, demonstrating that free allocation to utilities is a critical mechanism for ratepayer protection.

For this reason, disproportionate reductions to utility allocations pose a direct risk to the performance of the Climate Credit and the price of utility bills. Reducing the number of allowances available for consignment, as contemplated by the Staff Proposal, decreases the amount of revenue destined for ratepayers, all else equal. These impacts are especially consequential for low-income households and for communities that are already disproportionately burdened by energy costs. Protecting the Climate Credit therefore requires careful attention to how allowance removals and allocation changes are structured.

Maintaining a strong Climate Credit is also essential for advancing California's electrification and decarbonization strategies. Electricity affordability is a key driver of adoption of electric vehicles, heat pumps, and other clean technologies. By mitigating bill impacts, the Climate Credit helps make it more affordable for customers to transition away from fossil fuels.

As the Cap-and-Invest Program becomes more ambitious over time, affordability protections should be preserved and, where appropriate, strengthened. The CCMC therefore believes that program design should maintain or enhance ratepayer support through the Climate Credit alongside environmental objectives.

c. As we look to the next 20 years of the program, the CCMC encourages CARB to seek opportunities to protect the California Climate Credit value, despite disproportionate emissions reductions already achieved by the utility sector.

The utility sector has carried a disproportionate share of California's greenhouse gas emissions reductions under the Cap-and-Invest Program, while emissions in other covered sectors have declined more slowly and, in some cases, increased. These reductions have primarily been achieved by accelerating the transition from coal and natural gas–fired generation to renewable resources.

This outcome is not accidental; rather, it reflects a core strength of well-designed cap-and-invest programs. When incentives for abatement remain consistent over time, firms are encouraged to pursue emissions reductions when they are most cost-effective. In California's program, the utility sector was incentivized to pursue early emissions reductions because each ton reduced could be banked or sold in the current compliance period and, critically, could also be banked or sold in all future compliance periods. This policy design encouraged early action, supported investment in cleaner energy infrastructure, and helped lower compliance costs by providing flexibility in the timing of emissions reductions. CARB explicitly provided a 10-year fixed EDU allocation from 2021-2030 for this purpose.

Updating allowance allocations based on recent emissions can threaten the effectiveness of these incentives. This dynamic is referred to as "ratcheting" by economists and by California legislators as "rather perversely punishing the folks who have been doing the best work…who actually made those early investments." (Asm. Cottie Petrie-Norris, Feb. 23, 2026 Joint Legislative Committee on Climate Change Policies (JLCCCP) hearing). Indeed, if firms expect that lowering emissions today will lead to smaller allocations in the future, the policy signal to reduce emissions early becomes less clear. Over time, this type of approach can discourage early reductions and make long-term planning more difficult for regulated entities.

As CARB increases program ambition and tightens the cap, safeguarding the value and stability of the California Climate Credit, including by revisiting CARB's historical approach to utility allocations, should remain a priority to ensure that greater environmental stringency does not come at the expense of affordability, equity, or long-term public support. Doing so would align with stated intent of AB 1207 by the bill's author, who recently said that "we sort of changed the interpretation of the climate credit… [to] not just [help] with compliance," a view that was echoed

by Asm. Petrie-Norris, who said “if there’s one thing that cap-and-invest should protect, it’s electricity rates” (Feb. 23, 2026 JLCCCP hearing).

3. **The CCMC encourages CARB to continue facilitating linkage with Washington State.**

Linkage reduces total compliance costs across linked cap-and-invest programs by expanding the pool of abatement opportunities and equalizing marginal abatement costs across jurisdictions (Burtraw et al 2013). In addition to lowering aggregate costs, linkage can also reduce allowance price volatility by increasing market liquidity and broadening the base of covered entities (Doda, Baran, 2017). Linking with Washington would further reaffirm California’s position as a leader on climate policy. As noted in CARB’s 2026 Priorities Memo, finalizing this rulemaking is a necessary step toward enabling formal linkage with Washington, making timely completion of the process particularly important.

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Alicia Robinson
Elevate Climate

On behalf of the California Carbon Market Collaborative

California Carbon
Market Collaborative

November 12, 2025

Re: California Carbon Market Collaborative Comments for CARB's Informal Workshop on Potential Amendments to the Cap-and-Invest Program

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Invest Program held on October 29, 2025. This comment letter should be read together with our letters submitted to CARB on 31 July 2024, 17 August 2023, 26 October 2023, 15 December 2023, 08 May 2024 and 21 June 2024.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California Cap-and-Invest Program through 2045 and beyond. The CCMC gathers a wide array of Cap-and-Invest stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

1. The CCMC encourages CARB to balance the Legislative direction to retire allowances equal to offset use with the desire to reduce auction variability.

Adjusting auction supply each year proportionally to the prior year's offset use could cause variability in allowance prices and auction revenue, including a dip in auction revenue following a three-year compliance period. Therefore, the CCMC believes that CARB should consider options that balance the Legislature's direction and also reduce or eliminate the predictable variability for auctions.

For instance, CARB could proactively remove allowances from 2028 auction budgets onwards equal to the number of offsets estimated by CARB to equal 6% of emissions from 2026 onwards (the "offset usage allowances"). The removal of offset usage allowances by CARB could be done on a one-time basis any time before 2028 or on a rolling annual or compliance period basis. After compliance entities surrender offsets for compliance obligations in 2026 onwards, CARB could retire an equivalent number of allowances from the pool of offset usage allowances per AB 1207. To the extent that compliance entities surrender fewer than the 6% of offsets permitted by law, CARB could introduce a number of allowances after each full compliance period corresponding to unused offsets into future auction supply in a way that promotes auction stability.

To illustrate an exampe, if CARB estimated that 6% of emissions equals 10 million $MTCO_2e$ in 2027, 2028, and 2029, and therefore removed 10 million allowances from each of the 2028, 2029, and 2030 auction budgets (a total of 30 million allowances, representing the estimated maximum offset use), but only 24 million offsets were actually surrendered over the cumulative three-year compliance period, then CARB would retire 24 million allowances and spread out the remaining 6 million allowances across future auction budgets.

The CCMC recognizes that there are variations to the above approach, including only withholding allowances equal to the number of offsets CARB estimates that compliance entities will actually surrender based on the portion of the offset usage limit that has historically been used and CARB's estimate of future emissions. Another variation involves using emissions reported pursuant to California's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, rather than estimated emissions, as a basis for removing allowances from annual budgets. For instance, CARB could remove a number of allowances from the 2028 auction budget equal to 6% of the 2026 GHG emissions reported in 2027, and apply the same approach to subsequent annual auction budgets.

The CCMC also recognizes that any approach that assumes maximum offset use creates the possibility of over or underestimating offset usage and may therefore require CARB to periodically adjust auction supply accordingly if needed, such as after each full compliance period.

Importantly, the approaches discussed above could more effectively protect auction supply from the variability in compliance instrument surrender behavior within compliance periods.

2. The CCMC supports implementation of AB 1207's transition of support from natural gas suppliers to electric utilities in a manner that minimizes ratepayer impacts without delaying the implementation of the current rulemaking.

Since its initial comment letters beginning in 2023, the CCMC has strongly supported maintaining and enhancing the California Climate Credit. The CCMC reiterates that the California Climate Credit plays a critical role in supporting affordability for utility customers, which includes low income households that rely on both natural gas and electricity.

As CARB has pointed out, AB 1207 requires CARB to design the cap-and-invest regulations in a manner that considers affordability and consumer cost impacts. Therefore, the CCMC strongly encourages CARB to ensure that any steps taken to implement the transition required by AB 1207 protect low income and moderate income households that currently receive the California Climate Credit.

CARB's presentation acknowledged several complexities in the design and implementation of the transition, which also requires close coordination with the California Public Utilities Commission (CPUC). Given these complexities, the short timeframe for this rulemaking, and the ongoing CPUC proceeding, the CCMC strongly encourages CARB to take implementing steps in this rulemaking while identifying remaining issues that may appropriately be addressed in subsequent rulemakings where they can be more fully and carefully evaluated.

3. The CCMC supports leaning on the Cap-and-Invest Program to help achieve the state's ambitious climate targets.

Since 2023, the CCMC has consistently supported aligning program caps with the 48% emission reduction target identified in the 2022 Scoping Plan as the level of ambition needed by 2030 to be on track to meet California's 2045 goals under AB 1279. As stated in earlier public comment letters, the CCMC believes that the Cap-and-Invest Program is uniquely positioned among the state's suite of climate policies to lead the achievement of ambitious climate targets because it improves emissions certainty, aligns economic incentives, generates revenue for investment into California, and can contribute to lowering local air emissions.

This year, the legislature adopted important statutory guidance for CARB related to Cap-and-Invest through AB 1207, including ensuring the Program's caps, at a minimum, decline with the SB 32 and AB 1279 targets and considering the effect of the cap-and-invest regulations on affordability.

The CCMC believes that removing 118 million allowances from 2027-2030 annual budgets is the minimum number of allowance removals needed pre-2031.The CCMC continues to support near-term opportunities for additional allowance removals to increase the Program's ambition level while still supporting affordability of California's overall climate policy portfolio. The CCMC notes that achieving early GHG emissions reductions is particularly important for mitigating long-term climate change impacts.

Funding constraints and implementation delays are increasingly threatening underperformance of other California climate policies. The Cap-and-Invest Program is unique among California's suite of climate policies because it is capable of ramping up abatement in real time if other policies fall short of their goals. In this context, the Cap-and-Invest Program offers critical reassurance by reducing uncertainty in overall emissions outcomes and strengthening confidence in meeting statewide climate targets. The Cap-and-Invest Program is also uniquely capable of efficiently incentivizing high-quality carbon management, which is critical for achieving the state's long-term climate goals, and the CCMC therefore urges CARB to prioritize timely integration of this tool into the Program (including through implementation of SB 905). In short, now is the time for California to double down on its Cap-and-Invest Program.

4. The CCMC continues to support prioritizing allowance removals from the allocation and auction pools to increase environmental ambition.

The CCMC encourages CARB to prioritize removals from allowance pools that lead directly to increased ambition of the Cap-and-Invest Program while also supporting equity and affordability by protecting low-income households through tools like the California Climate Credit.

Consistent with the CCMC's 8 May 2024 and 26 October 2023 public comment letters, the CCMC encourages CARB to prioritize removals from allowance pools that lead directly to increased environmental ambition (i.e., greater GHG emissions reductions). Therefore, the CCMC continues to support prioritizing allowance removals from the allocation and auction pools, which provides the greatest possible certainty of achieving further emissions reductions.

Table 1 reflects the CCMC's initial assessment of the impact of removing allowances from specific pools on ambition. This initial assessment suggests that removing allowances from the following pools has the following estimated impact on ambition:

- A *certain* increase in ambition from removals in allocated and auctioned allowance pools;
- A *potential* increase in ambition from removals in price containment reserve allowance pools *if* trigger prices are reached; and
- A *potential and uncertain* increase in ambition from removals in the price ceiling *if* trigger prices are reached and *depending on* how any monies from "price ceiling unit" sales are used to reduce emissions.

Table 1

Removals from Allowance Pools and Estimated Impact on Ambition

Pool	Impact on Ambition
Price Ceiling	Per § 95915 of the Cap-and-Trade Regulation, allowances in the price ceiling are retired. Removals of these allowances only increase ambition if the price ceiling is triggered. After the allowances at the price ceiling are exhausted, price ceiling units are issued by CARB and any resulting monies are appropriated by the Legislature for purposes, including, but not limited to, providing direct rebates and investments to reduce household energy costs, including incentives to transition to zero-emission vehicles and energy efficient housing. The ultimate impact on ambition is therefore uncertain because there is uncertainty over precisely how the Legislature would spend any resulting monies.
Price Containment Reserve	Removal only leads to emissions reductions if the containment reserve is triggered.
Allocation and Auctions	Removal directly leads to emissions reductions.

In this context, it is also important to consider whether AB 398 (and by extension AB 1207) imposes limitations on whether—and to what extent—allowances can be removed from the APCR. First, it is unclear if existing law permits allowances placed in the APCR and the price ceiling to be used for purposes other than price containment. Second, even if it did, AB 398 could be read to require that at least 81.2 million allowances be kept in these pools. Finally, as annual budgets decline toward the 2045 target, the APCR and price ceiling are likely to become increasingly relevant to the Program's overall stability and design.

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Alicia Robinson
Elevate Climate

Re: California Carbon Market Collaborative Comments for CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Program

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 10 July 2024. This comment letter should be read together with our letters submitted to CARB on 17 August 2023, 26 October 2023, 15 December 2023, 08 May 2024 and 21 June 2024.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC gathers a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

1. **The CCMC puts forward two proposals for implementing changes to allocation in a timely manner during 2025 rather than waiting until 2026 as CARB outlined during the workshop.**

CARB has consistently messaged that the cap-and-trade rulemaking would be finished by the end of this year. Therefore, CARB surprised stakeholders and market participants during the workshop by revising the timeline for a completed rulemaking to "early 2025".

If the cap-and-trade rulemaking does conclude in early 2025, then according to the approach outlined by the workshop, CARB will not be able to influence 2025 cap levels because allowance allocations for 2025 must be determined by early December 2024 for auctioned allowances and 24 October 2024 for many compliance entities. Therefore, the updated timeline means that CARB won't be able to influence cap levels until 2026.

If CARB's current approach remains unchanged, then a delay of a few months for the rulemaking will cause an exacerbated delay of a year or more on allowance supply and demand, which has contributed to allowance prices recently dropping to their lowest level in over a year.

The CCMC created two options that would allow CARB to influence 2025 allocations even if the rulemaking is completed *during* 2025. The first option applies to auctioned allowances in 2025 and the second option applies to allowances allocated in 2025. The CCMC recommends implementing both proposals simultaneously. Both options offer the following benefits:

- Incentivizing earlier emissions reductions starting in 2025 rather than in 2026.
- Allowing CARB to maintain the effect of its original rulemaking timeline by facilitating changes to cap levels in 2025 rather than 2026.
- Facilitating a productive legislative discussion about extending cap-and-trade that is based on an updated regulation rather than leaving open a regulatory process that runs in parallel with legislative extension, thereby introducing unnecessary complexity and further uncertainty.
- Providing cost relief to compliance entities by spreading either 180 million allowance removals (Option 1 in CARB's workshop slides) or 265 million allowance removals (Option 2 in CARB's workshop slides) over six years between 2025 and 2030 rather than five years between 2026 and 2030. This approach would reduce the average annual cap decline from ~10 to ~8 percent under Option 1 and from ~14 to ~12 percent under Option

2 compared to the ~4 percent in the current regulation. In this way, the proposals would offer a less aggressive cap decline factor to compliance entities *without* increasing GHG emissions.

- Note that cumulative allocated and cumulative auctioned allowances between 2025 and 2030 would remain the same compared to the options proposed by CARB in their July workshop.

Proposal One: Pulling Allowance Removals Forward Via Auctions in 2025

Under this proposal, CARB could simply "pull forward" allowance removals into the 2025 auctions from any future auction. For example, CARB could decrease the quantity of allowances available at auction in 2025 and increase the quantity of allowances available at auction in 2030 by the same amount.

In terms of timing, CARB could simply change the quantity of allowances available at all remaining auctions in 2025 after the current rulemaking finalizes. For example, if CARB does not finalize an updated rule in time for the February auction, then CARB can change the quantity of allowances in the remaining three auctions for 2025 in May, August, and November.

This proposal would be straightforward to implement given that there are at least ten historical examples where CARB made mid-year changes to auctions without causing market disruption including modifying dates and updating the quantity of allowances offered without causing market disruption. Additions to regulatory language could further facilitate this proposal insofar as they are necessary.

While Proposal One would result in a lower quantity of auctioned allowances available in 2025, we note that if allowance prices appreciate in response to a "timely" implementation (instead of the "delayed" implementation in 2026 as proposed in the Workshop) then revenues for the greenhouse gas reduction fund could *increase* under Proposal One.

Proposal Two: Adjust Allowance Allocations for 2026

Under the current regulation, allocations for 2026 are distributed to compliance entities on 24 October 2025. Under Proposal Two, allocations for 2026 in the current regulation would be made subject to an "adjustment" when the ongoing rulemaking finalizes. That adjustment would represent a negative allocation that takes effect on 24 October 2025. In this way, the net allocation to compliance entities on 24 October 2025 would decrease by the level of the adjustment.

Equation 1 describes that net allocation for 2026 under Proposal Two would be the sum of (1) allocations to be distributed on 24 October 2025 according to the current regulation and (2) an adjustment to allocation that takes effect when the ongoing rulemaking finalizes. Note that the adjustment would be smaller than the allocation in the current regulation such that net allocation for 2026 remains positive.

Equation 1
Updating Allowance Allocations for 2026 Using an Adjustment

$$\begin{aligned} &Net\ Allocation\ for\ 2026 \\ &= (Allocation\ to\ be\ Distributed\ on\ 24\ October\ 2025\ According\ to\ Current\ Regulation \\ &- Adjustment\ to\ Allocation\ from\ Updated\ Regulation) > 0 \end{aligned}$$

There are provisions in the current regulation with similarities to the concept of adjustment described above. For example, Section 95890(k) outlines conditions under which covered entities must return allocations. As another example, Section 95892(a)(3) directs CARB's Executive Officer to retire a portion of allocation to the electric sector to account for Energy Imbalance Market purchaser emissions. For these reasons, we believe Proposal Two fits into CARB's current approaches to related issues.

The CCMC believes that Proposal Two should be relatively straightforward to implement for sectors receiving allocations based on cap adjustment factors. Additions to regulatory language could further facilitate this proposal insofar as they are necessary.

2. The CCMC continues to support the removal of 265 million allowances between 2025 and 2030 from allocation and auction pools.

Consistent with comment letters submitted to CARB on 08 May 2024 and 21 June 2024, the CCMC supports the removal of 265 million allowances between 2025 and 2030 from the allocation and auction pools. This level of removals would ensure that the C&T program plays at least a proportional role in California's climate policy mix according to the 2022 Scoping Plan. Moreover, as first outlined in a comment letter submitted to CARB on 17 August 2023, the CCMC continues to support the cap-and-trade program playing an increasing role in California's climate policy mix for the following reasons.

a. California's Cap-and-Trade Program is Environmentally Effective and Economically Efficient

First, the California C&T program reduces greenhouse gas emissions at approximately 30 dollars per ton, which is substantially lower than the social cost of carbon. In addition, C&T programs offer greater emissions certainty and provide a market signal to find least-cost reductions.

b. California's Cap-and-Trade Program Lowers Local Air Emissions

Second, the CCMC argues that lower cap levels imply local air emissions reductions, thereby supporting environmental justice outcomes. This notion was identified in 2016 by a group of academics including Dr. Manuel Pastor (USC) and Dr. Rachel Morello-Frosch (UC Berkeley) who theorized that "as regulated industries adapt to future reductions in the emissions caps, California is likely to see more reductions in localized greenhouse gas emissions and co-pollutant emissions".[1]

However, statistically "proving" that the C&T program reduces local air emissions has been complicated by the difficulty in identifying reliable control and treatment groups, a prerequisite to robust statistical studies. That difficulty stems from the fact that California implements several dozen climate policies simultaneously, making it complex to parse the "signal" from the C&T program from the "noise" of all other policies reducing local air emissions. For this reason, most studies to date have only been able to make claims about the *correlation* between the C&T program and local air emissions rather than directly answering the question of whether the C&T program *causes* a reduction in local air emissions.

[1] Cushing, Lara, Wander, Madeline, Morello-Frosch, Rachel, Pastor, Manuel, Zhu, Allen and James Sadd. 2016. "A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program". Research Brief by UC Berkeley, Occidental College, and USC.

Recently, two causal studies were published that in CCMC's view represent the best available scientific evidence answering the question of whether the C&T program changes local air emissions. First, Hernandez-Cortes and Meng (2023) find that "during 2012–2017, the C&T program reduced emissions annually at a rate of 9%, 5%, 4%, and 3% for GHG, PM2.5, PM10, and NOx, respectively, for the average sample regulated facility."[2] A presentation from Dr. Manuel Pastor at a 18 July 2024 meeting of the Environmental Justice Advisory Committee (EJAC) revised the Hernandez-Cortes and Meng (2023) study by among other things using an updated dataset, finding the C&T program reduced emissions annually at a rate of 3.2%, 2.3%, 0.7% and 0% for GHG, PM2.5, PM10, and NOx, respectively. Second, Sheriff (2023) finds that "minority communities experienced a relative reduction in cumulative exposure from [air toxic releases]" caused by the California C&T Program.[3] In conclusion, the CCMC believes based on the best available scientific evidence that lowering caps also lowers local air emissions.

In summary, the CCMC reiterates that removing 265 million allowances rather than 180 million allowances will likely lead to lower local air emissions including for disadvantaged communities. There are many other options for reducing local air emissions that are also worthy of further consideration[4] although since CARB is actively considering cap levels it is the CCMC's view that the most direct approach to securing lower local air emissions in the context of this rulemaking is to support the lowest cap level under consideration.

c. Allowance Banking Allows for Smoothing of Costs Over Time

Third, the allowance banking feature within the cap-and-trade program allows for smoothing of costs over time which helps avoid unnecessary shocks to prices. This is a feature that is unique to certain types of market-based programs.

d. The California Climate Credit Protects Affordability in the Electric Sector

Fourth, affordable electricity prices are important to California's decarbonization. For example, the 2022 Scoping Plan highlighted the importance of electrification in getting California to carbon neutrality by 2045. As another example, Dr. Meredith Fowlie's testimony to the Joint Legislative Climate Change Committee earlier this year highlighted how important electricity affordability is in driving electrification in the state.

Fortunately, the California C&T program is designed to protect electricity ratepayers, thereby limiting affordability impacts on households. Specifically, the California Climate Credit is part of the California C&T program. As the Governor's Office has pointed out, the California Climate Credit delivers "real climate action while giving you money back on your utility bills" and provides relief that "support[s] millions on California's families".[5]

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[2] Hernandez-Cortes, Danae and Kyle Meng. 2023. "Do Environmental Markets Cause Environmental Injustice? Evidence from California's Carbon Market." *Journal of Public Economics* 217: 104786.

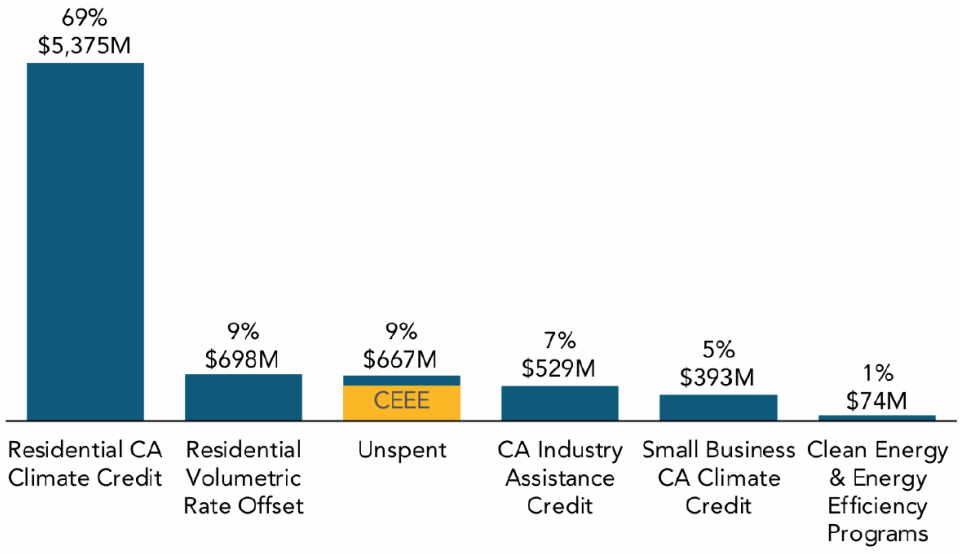
[3] Sheriff, Glen. 2023. "California's GHG Cap and Trade Program and the Equity of Air Toxic Releases". *Journal of the Association of Environmental and Resource Economists*.

[4] Including but not limited to more funding for air quality policies and targeted funding for projects that reduce local air emissions. These and other approaches have been discussed at recent meetings of the Environmental Justice Advisory Committee and the Independent Emissions Market Advisory Committee.

[5] Governor Gavin Newsom. 2024. "Californians to Get Average of $146 in Credits on their April Utility Bills Thanks to State's Climate Program". Available here: Millions of Californians to Get Average of $146 in Credits on their April Utility Bills Thanks to State's Climate Program | Governor of California.

The California Climate Credit provisions of the current regulation consign allowances to electric investor-owned utilities (IOUs) and proceeds must be used to benefit ratepayers consistent with the goals of Assembly Bill 32. As illustrated in Figure 1, the majority of IOU allowance value is returned to electricity ratepayers as California Climate Credits, which show up as rebates on consumer electricity bills in April and October annually. From 2013 – 2021, the total allocated allowance value was $7.74 billion, of which $5.38 billion (69%) went directly to California residents via the California Climate Credit.

Figure 1
IOU Use of Allocated Allowance Value from 2013 to 2021
Source: Cap-and-Trade Program Summary of 2013-2021 Electrical Distribution Utility Use of Allocated Allowance Value



e. The California Climate Credit Should Be Updated to Further Benefit Low-Income and Disadvantaged Communities by Disproportionately Lowering Their Net Electricity and Natural Gas Bills

Fifth, the CCMC reiterates that the California Climate Credit should be redesigned to disproportionately target rebates in low-income and disadvantaged communities, rather than returning rebates lump-sum across all households, per the provisions in the current regulation. This would further benefit low-income and disadvantaged communities by increasing the size of the rebate and thereby further reducing their net electricity bills. Protecting lower-income communities from high electricity bills is especially important because Borenstein et al. (2022)[6] show that higher electricity prices are more regressive than higher gasoline prices or higher income taxes. To that end, the CCMC repeats its assertion in our 26 October 2023 letter to CARB that the California Climate Credit could be updated to increasingly target lump-sum distributions

[6] Borenstein, Severin, Fowlie, Meredith, and James Sallee. 2022. "Paying for Electricity in California: How Residential Rate Design Impacts Equity and Electrification". WP-330 UC Energy Institute at Haas.

to low-income and/or disadvantaged electric and natural gas ratepayers to further channel revenue toward progressive outcomes.

3. Conclusion

The CCMC thanks CARB for the opportunity to provide public comment and looks forward to further engaging with CARB. Please direct any comments or questions to Clayton Munnings, Co-Founder of Elevate Climate, at clayton@elevateclimate.com.

Sincerely,

Clayton Munnings
Co-Founder
Elevate Climate

Re: California Carbon Market Collaborative Comments on CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Program

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 31 May 2024. This comment letter should be read together with our letters submitted to CARB on 17 August 2023, 26 October 2023, 15 December 2023, and 08 May 2024.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC gathers a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

1. **The CCMC reiterates support for Proposed Scenario A in the Standardized Regulatory Impact Assessment to maximize emissions reductions from the cap and trade (C&T) program.**

The CCMC reiterates that the decision of which pools allowances are removed from has a critical impact on overall emissions reductions. In short, the Proposed Scenarios likely have *different* emissions outcomes rather than "similar emissions outcomes" as suggested in the Standardized Regulatory Impact Assessment (SRIA). Consistent with previous comment letters submitted on 26 October 2023 and 08 May 2024, the CCMC reiterates that removing allowances from the allocation and auction pools provides the greatest possible certainty of achieving emissions reductions in line with the 2022 Scoping Plan. This is consistent with Proposed Scenario A in the SRIA.

The CCMC notes that Proposed Scenarios B and C in the SRIA likely yield lower emissions reductions because they rely on removing allowances from the Allowance Price Containment Reserve (APCR) tiers. As explained in previous comment letters submitted on 26 October 2023 and 08 May 2024, removals from the APCR tiers only leads to emissions reductions if and when the containment reserve is triggered and subsequently exhausted. Yet the SRIA assumes APCR tiers are <u>not</u> exhausted, which directly contradicts the SRIA assertion of "similar emissions outcomes" across Proposed Scenarios A, B, and C.

A recently released report by the nonprofit nonpartisan think tank Resources for the Future (RFF) confirms and quantifies the CCMC's observations above. Specifically, Dr. Dallas Burtraw (Member of the Independent Emissions Markt Advisory Committee or "IEMAC") and his coauthors find that Proposed Scenario A "yields lower emissions than [Proposed Scenarios] B and C, especially if, as CARB's SRIA assumes and this report affirms, APCRs are never triggered" (Roy et al., 2024).[1]

[1] Roy, Nicholas, Domeshek, Maya and Dallas Burtraw, 2024. Addressing Uncertainty is Key to the Success of California's Cap-and-Trade Program.

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2. **The CCMC supports a more proportional removal of allowances than proposed in CARB's "estimated distribution of allowance budgets" presented on Slide 19.**

The estimated distribution of allowance budgets on Slide 19 includes a 40% reduction in allocations to electrical distribution utilities (EDUs) and a 7% expansion of allowances auctioned for the Greenhouse Gas Reduction Fund (GGRF). The CCMC supports a more proportional removal of allowances that includes fewer reductions to EDU allocations.

First, as CARB noted on Slide 18 at the 31 May 2024 workshop, "CARB allocates allowances to electrical distribution utilities (EDU) and natural gas suppliers (NGS) for the protection and benefit of ratepayers." The CCMC notes that disproportionate reductions to the utility sector will risk the performance of the California Climate Credit, which CARB has recognized as "an essential tool" to offset the costs of the C&T Program for ratepayers. Removing allowances from utility allocations will decrease the amount of revenue destined for ratepayers all else equal.

The IEMAC and the Environmental Justice Advisory Committee (EJAC) have also recognized the importance of the California Climate Credit, particularly for low-income households. At the 11 March 2024 JLCCCP hearing, Dr. Meredith Fowlie (Chair of IEMAC) expressed concern over increasing electricity costs and highlighted that low-income households spend a larger share of their income on utility bills than other income brackets.

Rather than decreasing ratepayer protection through removing allocated allowances, the CCMC believes there are opportunities to enhance the value of these allowances for the benefit of ratepayers by, for example, targeting low-income and/or disadvantaged ratepayers to further channel revenue toward progressive outcomes.

Second, the electricity sector has reduced their GHG emissions more than any other sector in response to the C&T program according to a recent peer-reviewed academic article. Specifically, writing in the journal *Energy Policy*, Lessmann and Kramer (2024)[2] find a 48 percent reduction in utility sector emissions primarily attributable to California's C&T program. Figure 1 below shows observed emissions in the electricity sector compared to a counterfactual synthetic control as reported by Lessman and Kramer (2024). The CCMC views it as inequitable to remove the most allowances from the sector that has reduced the most emissions in response to the C&T program. Allowance removals should not punish good actors.

[2] Lessmann, Christian and Niklas Kramer. 2024. "The Effect of Cap-and-Trade on Sectoral Emissions: Evidence from California". *Energy Policy*.

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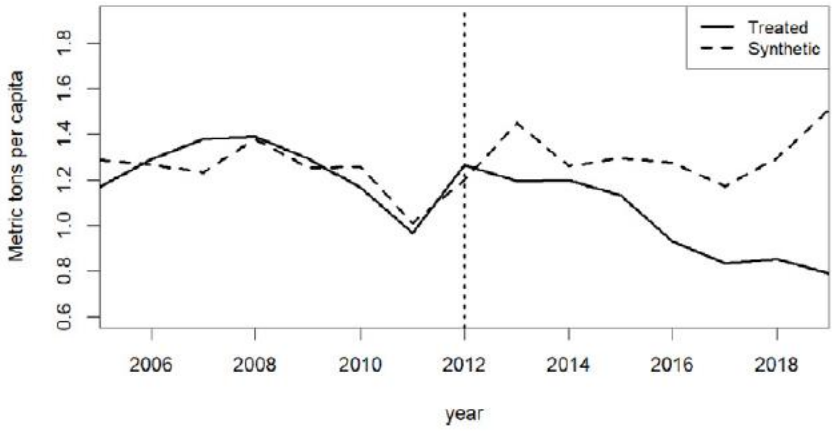
Figure 1
CO2 Emissions in the Electricity Sector 2005-2019: California versus Synthetic California
Source: Lessmann and Kramer (2024)



3. The CCMC supports exploring alternative pathways for increasing GGRF revenues.

The CCMC views increasing the number of auctioned allowances (as illustrated on Slide 19) as not strictly necessary because revenues will increase in any case. The aforementioned Resources for the Future report explains that "rising allowance prices triggered by the tighter [allowance] budget mean that the GGRF will receive more allowance value than in the current [allowance] budget, even if its share of the value falls relative to the share directed to free allocation" (Roy et al., 2024). For example, over the 2025 to 2030 timeframe, GGRF revenues double from 6 billion to nearly 12 billion under Proposed Scenario A, even if allowance removals are taken *entirely* from the auctioned pool of allowances. As mentioned in Section 1, Proposed Scenario A would also provide the greatest possible certainty of achieving emissions reductions in line with the 2022 Scoping Plan.

We encourage CARB to explore two alternatives that could and/or would raise GGRF revenues without necessarily increasing the number of auctioned allowances. First, choosing Scenario A will lead to further emissions reductions and greater GGRF revenues rather than choosing Scenarios B or C. Second, the introduction of an emissions containment reserve (ECR) would "reduce[] the number of emissions allowances sold at low prices, can make the market more robust in the face of uncertainty, ensure greater emissions reductions, and increase revenues to the Greenhouse Gas Reduction Fund" (Roy et al., 2024). In previous comment letters (17 August 2023 and 26 October 2023), the CCMC has described the ECR as an "insurance policy" against low prices and has argued that an ECR is a prudent approach to address the "difficulties in estimating the performance of regulatory policies nearly a decade into the future."

4. The CCMC emphasizes the importance of regulatory certainty.

The CCMC looks forward to continue engaging in the C&T rulemaking process and emphasizes the importance of regulatory certainty and the rulemaking timing for a wide range of stakeholders.

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Sincerely,

Clayton Munnings
Co-Founder
Elevate Climate

Alicia Robinson
Co-Founder
Elevate Climate

CALIFORNIA CARBON MARKET COLLABORATIVE
COMMENT LETTER TO CARB
08 MAY 2024

Re: California Carbon Market Collaborative Comments on CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Program

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 23 April 2024. This comment letter should be read together with our letters submitted to CARB on 17 August 2023, 26 October 2023, and 15 December 2023.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC gathers a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

1. **The CCMC continues to support prioritizing allowance removals from the allocation and auction pools to increase environmental ambition.**

Consistent with the CCMC's 26 October 2023 public comment letter, the CCMC encourages CARB to prioritize removals from allowance pools that lead directly to increased environmental ambition (i.e., greater GHG emissions reductions). Therefore, the CCMC continues to support prioritizing allowance removals from the allocation and auction pools, which provides the greatest possible certainty of achieving further emissions reductions in line with the 2022 Scoping Plan. This approach is most consistent with "Proposed Scenario A" in the Standardized Regulatory Impact Assessment (SRIA). As outlined below, any alternative approaches that remove allowances from other pools do not guarantee emissions reductions outcomes envisioned by the 2022 Scoping Plan.

As explained in the CCMC's 26 October 2023 public comment letter, removing allowances from the Allowance Price Containment Reserve (APCR) only leads to emissions reductions if and when the containment reserve is triggered and subsequently exhausted. The CCMC recognizes that the SRIA is not a formal staff proposal, but notes for illustrative purposes that the SRIA projects allowance prices well below Tier 1 of the APCR. Page 47 of the SRIA explains that "specifically, staff analysis suggests that, as GHG emissions fall in response to California's suite of climate change programs, cumulative allowance demand through 2045 may not exhaust cumulative Program budgets and thus average allowance prices may find a middle ground between the auction price floor and the price ceiling."

The above finding implies that allowances from the APCR Tiers are never released to the market. If this were true, then removing allowances from the APCR Tiers would <u>not</u> reduce GHG emissions because these allowances would never have been used anyway. It follows that SRIA Proposed Scenarios B and C, which include removals from the APCR tiers, would <u>not</u> reduce GHG emissions as much as Proposed Scenario A. This points to a contradiction in the SRIA's

assumption that there is “only one emissions reduction outcome” across Proposed Scenarios A, B, and C.

The CCMC also notes that removing allowances from the APCR tiers per Proposed Scenarios B and C unnecessarily increases allowance price volatility and risks price spikes that exceed APCR Tier prices. For the avoidance of doubt, the analysis regarding environmental ambition applied to the APCR tiers above also holds true for removing allowances from the price ceiling.

Finally, whether AB 398 imposes limitations on how many allowances can be removed from the APCR is also worth considering, as AB 398 could be read to require that 81.2 million allowances be kept in these tiers. In addition, the CCMC notes that only 31.1 million allowances are assigned to the APCR from the 2025-2030 budgets, which CARB has identified as the relevant timeframe for the contemplated allowance removals.

For all of the above reasons, the CCMC reiterates that removing allowances from auction and allocation offers the greatest possible certainty for achieving the GHG reductions in line with the 2022 Scoping Plan.

2. **If CARB seeks to address the “potential discontinuity” between 2030 and 2031 annual budgets, the CCMC offers three potential options for consideration that would maintain or increase environmental ambition.**

CARB’s 23 April 2024 workshop identified a potential “discontinuity” in caps between 2030 and 2031 that could impact cap adjustment factors, allocations, holding limits, and funds to the greenhouse gas reduction fund (depicted on Slide 11 of the 23 April 2024 workshop).

As CARB considers whether, how, and/or when to address the discontinuity, the CCMC emphasizes that CARB’s ultimate approach should not come at the expense of achieving the 48% emission reduction target identified in the 2022 Scoping Plan Update and the SRIA Proposed Scenario, which requires removing 265 million allowances from the 2025-2030 budgets.

The CCMC outlines three potential options for addressing the discontinuity without expressing a preference for any particular option. The CCMC’s intent is that these potential options facilitate robust consideration of a wide array of approaches.

While there are tradeoffs with each potential option that the CCMC is actively analyzing, the potential options identified below either maintain or increase environmental ambition for the C&T program.

- Option #2 Approach: CARB could start the 2031 annual budget from the 2030 allowance budget (139 MMTCO2e) and set subsequent annual budgets to decline linearly from that start point, consistent with the solid yellow line on Slide 35 of the 5 October 2023 workshop and referred to as “Option #2” at the same workshop. This approach would increase the ambition of the C&T Program by removing an additional 235 million tons of allowances from 2031-2045 caps. This approach better positions the C&T Program as a backstop if complementary policies underperform. See the red dashed line in Figure 1 below.

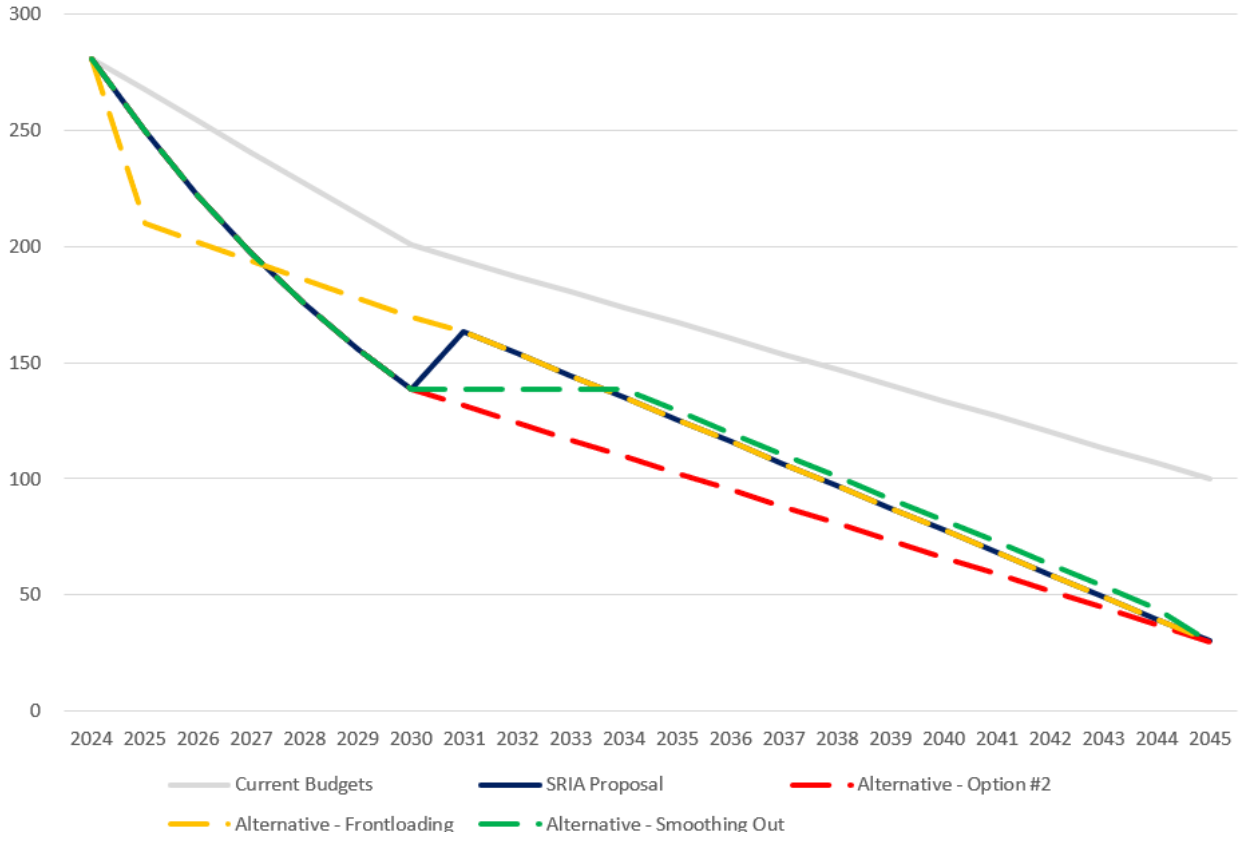
- Smoothing Out Approach: CARB could start the 2031 annual budget from the 2030 allowance budget (139 MMTCO2e) instead of the 2030 Scoping Plan emission reduction target (173 MMTCO2e). CARB could then distribute the allowances that would have comprised the discontinuity across future budget years. The green dashed line in Figure

1 illustrates one of many ways to distribute allowances across the 2031-2045 period. This approach would maintain the 2045 annual budget of 30.3 million allowances and the same 2031-2045 cumulative allowance budgets shown on Slide 34 of the 5 October 2023 workshop.

- Frontload Approach: CARB could "frontload" the allowance removals, which would result in lower caps in 2025-2026 and higher caps in 2029-2030 than currently contemplated on Slide 11 of the 23 April 2024 workshop. This approach would enable CARB to maintain the ambition outlined in the SRIA and start the post-2030 budget trajectory from the Scoping Plan target. See the yellow dashed line in Figure 1 below.

Figure 1 visualizes the concepts presented above compared to CARB's current budgets (light grey line) and proposed Scenario in the SRIA (dark blue line). The dashed lines represent each of the concepts discussed above.

Figure 1: Approaches for Addressing the Discontinuity



3. **The CCMC supports the continued use of the California Climate Credit and further targeting of that credit toward low-income and disadvantaged communities.**

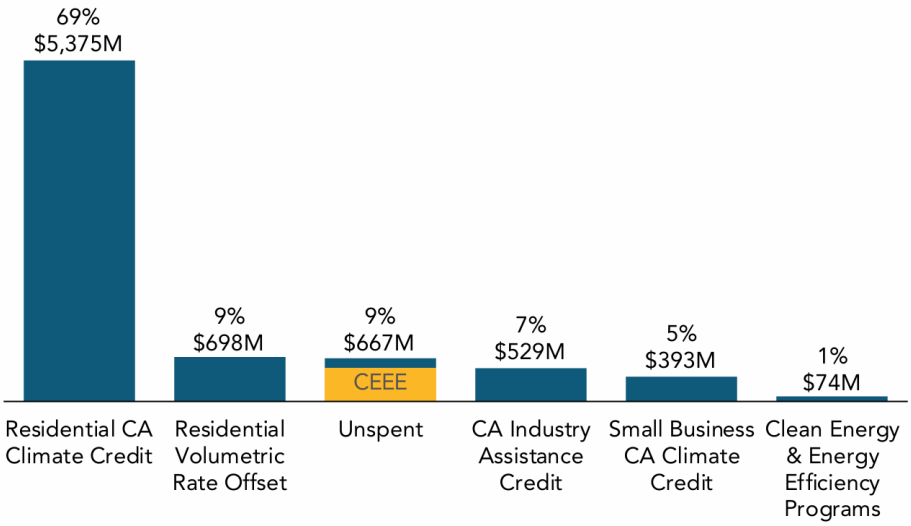
The 2022 Scoping Plan highlighted the importance of electrification in getting California to carbon neutrality by 2045. Dr. Meredith Fowlie's testimony to the Joint Legislative Climate Change Committee earlier this year highlighted how important electricity affordability is in driving electrification in the state. Recently, the Governor's Office issued a press release explaining the

California Climate Credit and expected rebates based on electricity providers. The CCMC welcomes these contributions and makes the following additional points:

- Electric investor-owned utilities (IOUs) are required to annually consign all of their allocated allowances for the benefit of ratepayers consistent with the goals of AB 32.
- The majority of the IOU allowance value is returned to electricity ratepayers as California Climate Credits (rebates), with the remaining value used for renewable energy, energy efficiency, and transportation electrification projects.
- From 2013-2021, the total allocated allowance value was $7.74 billion, of which $5.38 billion (69%) went directly to California residences (see Figure 2 below).

The detailed presentation by Kevin Hamilton on behalf of the AB 32 Environmental Justice Advisory Committee (EJAC) at the 23 April 2024 workshop also highlighted the importance of rebates to support low-income households. The CCMC notes that these rebates are made possible through the continued use of free allocations to utilities. As noted in the CCMC's 26 October 2023 public comment letter, this rebate framework could be updated to increasingly target lump-sum distributions to low-income and/or disadvantaged ratepayers to further channel revenue toward progressive outcomes. The CCMC also supports CARB's inclusion of environmental justice perspectives at the workshop.

Figure 2: IOU Use of Allocated Allowance Value in 2013-2021



Source: Cap-and-Trade Program Summary of 2013-2021 Electrical Distribution Utility Use of Allocated Allowance Value https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/allowanceallocation/edu_2013to2021useofvaluereport.pdf

4. **The CCMC notes that periodic updates are an important element of ensuring offset protocol designs reflect implementation experience and best practice.**

The CCMC welcomes continual updates and improvements to the Compliance Offset Protocols, including those contemplated as part of this rulemaking. The CCMC notes the unique role of carbon offsets in leveraging private investment to help achieve in-state reductions in sectors not

covered by the C&T program. Protocols such as the Ozone Depleting Substances Protocol have helped the state achieve significant in-state reductions of local air emissions and the CCMC welcomes the protocol's continued use and improvement. In addition, the Urban Forestry Protocol possesses significant potential to generate emissions reductions as well as local air quality improvements in urban areas, and the CCMC would support protocol updates that catalyze its utilization. Other protocols, such as Improved Forest Management, are strongly supported by certain California tribes as important sources of income generation, and the CCMC supports improvements to this protocol.

5. **The CCMC highlights key considerations when evaluating updates to Corporate Association Group (CAG) rules and holding limit rules in order to protect environmental ambition.**

The CCMC does not have enough information at this time to make a recommendation on the proposed CAG rules, except that the CCMC agrees with CARB's view that implementing the rules immediately (instead of one or more years after the rulemaking) could lead to unnecessary price volatility and a phased in approach is prudent.

CARB's 23 April 2024 workshop also estimated that over 20 million allowances could be released into the market as a result of holding limit reductions alongside annual budget reductions. The CCMC notes that holding limits are closely entwined with allowance banking. At the 16 November 2024 workshop, CARB indicated that its current banking rules help to (1) reduce compliance costs and mitigate concerns about price volatility, (2) create compliance flexibility, (3) incentivize early emission reductions, and (4) encourage a long-term commitment from market participants.

To the extent CARB is evaluating potential changes to the holding limit to avoid disrupting banking or to address fluctuations to the holding limit caused by the 2030-2031 discontinuity, the CCMC offers two potential options. First, CARB could update the holding limit through 2030 to reflect the existing annual allowance budgets rather than the revised annual allowance budgets. Second, CARB could change the holding limit formula in a way that would "decouple" it from the annual allowance budget by removing the annual allowance budget as a variable and replacing it with a more gradual decline approach.

Sincerely,

Clayton Munnings
Co-Founder
Elevate Climate

Alicia Robinson
Co-Founder
Elevate Climate

CALIFORNIA CARBON MARKET COLLABORATIVE
COMMENT LETTER TO CARB
15 DECEMBER 2023

Re: California Carbon Market Collaborative Comments on CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Program

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 16 November 2023. This comment letter should be read together with our letters submitted to CARB on 17 August 2023 and 26 October 2023.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC gathers a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

In summary, the CCMC reiterates its emphasis on ambition as CARB updates California's C&T Program. As detailed in Section 1, the modeling results clearly indicate that extending the C&T Program beyond 2030 is the simplest way to enhance ambition. As discussed in Section 2, the C&T Program achieves highly cost-effective emission reductions. Therefore, further reliance on carbon markets facilitates the cost-effective achievement of California's ambitious climate targets and should invite California to do more. In addition, crafting a more ambitious C&T Program that accounts for and incentivizes climate technologies will supercharge California's ability to leverage the unprecedented funding available through the Inflation Reduction Act to build new in-state infrastructure that reduces GHG emissions.

As outlined in Section 3, the CCMC argues the modeling results presented by UC Davis should be updated before being used to inform changes to the C&T Program. We identify a number of serious concerns around the modeling approach and underlying assumptions which critically undermine the reliability of UC Davis's allowance price projections. Each of these concerns should be directly addressed in a subsequent round of economic modeling presented at another CARB public workshop.

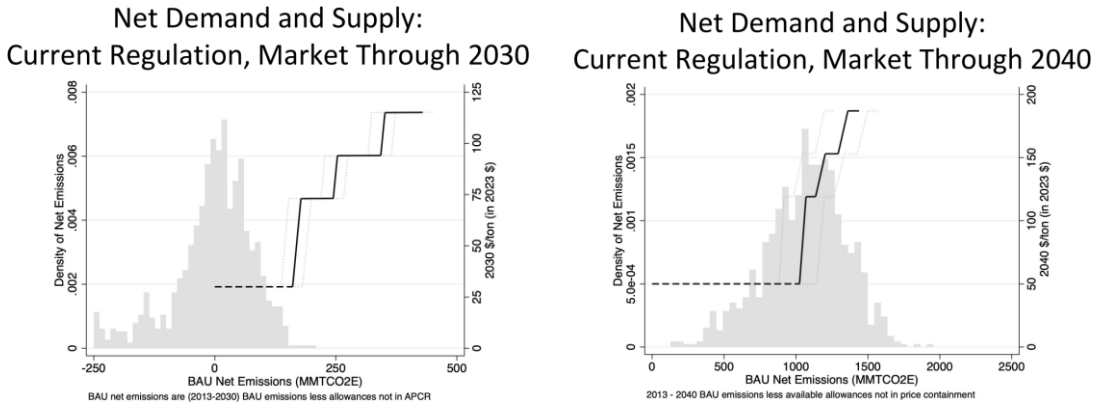
As discussed in Section 4, the CCMC expresses unambiguous support for maintaining the current joint market rules as they pertain to the banking of allowances. Allowance banking is a fundamental aspect of C&T Programs that incentivizes regulated entities to reduce GHG emissions sooner than they would otherwise, thereby providing substantial environmental benefits.[1] Section 4 summarizes a number of case studies illustrating that a wide range of climate policies underperform when the regulator does not allow unlimited banking.

[1] Leard, Benjamin. 2013. "The Welfare Effects of Allowance Banking in Emissions Trading Programs." *Environmental and Resource Economics* 55: 175-197.

1. The CCMC Applauds CARB for its Post-2030 Scenarios

The CCMC agrees with Dr. Bushnell from UC Davis that "the single biggest impact California can have to encourage abatement through its cap and trade [program] is committing to the program beyond 2030".[2] Dr. Busnhell's point is clearly communicated in Slides 28 and 29 of the November 16 Workshop Combined Presentation, excerpted below. By simply extending the C&T Program from 2030 to at least 2040, net demand for allowances transitions from falling behind to significantly outpacing allowance supply in expectation.

Figure 1
Net Demand and Supply With and Without C&T Program Extension Beyond 2030
Source: UC Davis Presentation, November 16 CARB Workshop



As the CCMC mentions in previous public comment letters to CARB, an uncertain future for the C&T Program leads to uncertainty for project developers who may not see the value or benefit from GHG emission reductions they create beyond 2030. Extending the C&T Program beyond 2030 ends that uncertainty and therefore sends a strong signal to compliance entities and infrastructure investors to reduce GHG emissions. The CCMC applauds CARB for its continued consideration of a number of Scenarios and Options extending well beyond 2030.

2. A Unique Opportunity for the C&T Program to Supercharge Decarbonization Projects

The CCMC reiterates that California has a unique opportunity with the C&T rulemaking to supercharge decarbonization projects into California that create jobs and reduce GHG emissions by combining the following:

- A high ambition cap trajectory (at least a 48% Scenario) selected during the ongoing rulemaking;
- A C&T Program updated through the ongoing rulemaking that accounts for and/or incentivizes a wide array of climate technologies; and,

[2] Bushnell, James. 2023. "California's Cap-and-Trade Market Enters its Teen-Age Years" https://energyathaas.wordpress.com/2023/11/27/californias-cap-and-trade-market-enters-its-teen-age-years/

- Leveraging the unprecedented funding opportunity through the Inflation Reduction Act available for a number of climate technologies.

In short, California should race to update its C&T Program with an ambitious cap trajectory so that decarbonization project developers can "stack" the opportunity for selling or avoiding the use of allowances on top of the competitive support and generous subsidies currently offered by the Inflation Reduction Act.

3. The CCMC Recommends Another Public Workshop with Updated Modeling Results

The CCMC appreciates that CARB undertook economic analysis of potential amendments to the C&T Program. Further, the CCMC understands the inherent difficulty of estimating allowance prices over a long time horizon starting in 2025 and extending beyond 2040.

Nonetheless, our analysis below of the underlying assumptions and modeling approach undertaken by UC Davis reveal serious concerns that critically undermine the reliability of resulting allowance price projections. Each of these concerns should be directly addressed in a subsequent round of economic modeling presented at another CARB public workshop.

The CCMC views an updated round of modeling as an essential foundation for the ongoing rulemaking process where CARB will make many policy design decisions that could endure well over 15 years into the future. Ideally, the CCMC encourages CARB to consider taking an alternative approach to modeling altogether, which focuses on the structure of California's marginal abatement cost curve through 2045 rather than relying on a vector autoregressive (VAR) approach. In any case, the modeling presented by UC Davis should be updated before being used to inform changes to the C&T Program.

a. The Underlying Assumptions

The UC Davis team makes several additional unclear or unrealistic assumptions. The CCMC therefore recommends clarifying or relaxing each of these assumptions in a subsequent round of economic modeling. Otherwise, it will remain difficult to determine the accuracy of allowance price projections.

i. Lack of Clarity Around Complementary Policies

We understand that the UC Davis team augments its VAR approach by assuming abatement occurs from policies complementary to the carbon price according to the 2022 Scoping Plan. At the outset, this is confusing because the model seems to account for abatement from certain policies in the 2022 Scoping Plan, such as those pertaining to zero emissions vehicles (ZEV), but does *not* account for others–such as targets related to carbon capture and sequestration (CCS), direct air capture (DAC) and hydrogen. It would therefore be helpful for the modeling team to clarify precisely which policies are included in their analysis and which are not. One approach to communicate these assumptions clearly would be to provide stakeholders with a "waterfall" chart that could show business-as-usual emissions (1) minus abatement from each complementary

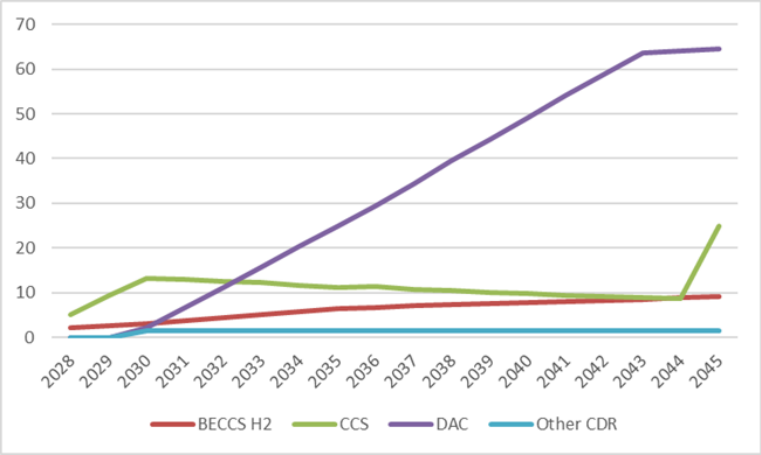
policy, (2) minus abatement from the carbon price, (3) plus the APCR supply, and (4) plus non-APCR supply.

We also understand that the UC Davis team treats abatement from complementary policies and targets in the Scoping Plan as insensitive to the carbon price. This seems counterintuitive because the carbon price helps with the achievement of many targets outlined in the Scoping Plan. Moreover, the carbon price is already in operation and already revealing allowance scarcity, whereas all of the targets in the Scoping Plan do not necessarily have the underpinning mandates or rules to guarantee their achievement. For these reasons, the CCMC questions whether counting abatement from complementary policies as price insensitive is a reasonable assumption and therefore recommends that this assumption be revisited.

ii. Failure to Account for Important Abatement Technologies

The 2022 Scoping Plan calls for substantial abatement from CCS, DAC, and hydrogen from bioenergy carbon capture and sequestration (BECCS H2). As shown in Figure 2, the E3 PATHWAYS Model used in the 2022 Scoping Plan calls for a total of 920 million tons of abatement between 2025 and 2045 from CCS (202 million tons), DAC (583 million tons), and BECCS H2 (112 million tons). In addition, the 2022 Scoping Plan calls for significant quantities of hydrogen supply from electrolysis and synthetic methane reformation with biogas in 2035 and 2045.

Figure 2
Deployment of Carbon Management Technologies in the 2022 Scoping Plan
Source: E3 PATHWAYS Model, 2022 Scoping Plan



The UC Davis team does not incorporate any of these abatement pathways. In and of itself, this calls into question the accuracy of the forecasted price projections. For context, the adjustments to 2025 through 2040 allowance budgets under consideration by CARB are 380 million tons (Alternative 1), 695 million tons (Alternative 3a and 3b), and 970 million tons (Alternative 2). The current modeling results show allowance prices at the price ceiling without abatement from carbon management technologies outlined in the Scoping Plan. However, if we assume that the C&T Program accounts for and/or incentivizes these abatement technologies, then the market could

reveal floating allowance prices between the price floor and the price ceiling, or perhaps even allowance prices resting on the price floor. This is because the quantity of abatement from carbon management (~920 million) in the Scoping Plan would probably be greater than the expected removal of allowances from the Alternatives under consideration between 380 million under a 40% Scenario to 970 million tons under a 55% Scenario. In short, the model omitted a set of carbon management technologies that could be the key determinant of allowance prices.

Whether the C&T Program will account for and/or incentivize the abatement technologies outlined in the Scoping Plan is an outstanding question that depends on the economic costs of deployment and additional regulatory hurdles. From a technical perspective, it is likely relatively straightforward to integrate CCS into the Program because CARB would simply need to net out verified and sequestered GHG emissions from the GHG emissions reported by covered facilities. In contrast, it is likely more technically complex to integrate DAC into the Program because these DACs are not "attached" to covered facilities. Without further opining on these technicalities, we proceed by focusing on CCS as an illustrative example because CARB Staff has discussed in recent workshops (e.g., June 14, 2023) that they are evaluating opportunities to align treatment of CCS within the C&T Program in light of the 2022 Scoping Plan and implementation of Senate Bill 905.

A Case Study on Carbon Capture and Storage

In the context of California's C&T Program, a fundamental question is whether abatement from CCS would be induced at current or future allowance price levels. As illustrated below, a report by Lawrence Livermore National Lab and Clean Air Task Force indicates carbon can be captured in a range of applications from between 16 and 140 USD per ton.[3] Similarly, reports from Boston Consulting Group identifies clusters of CCS in Southern California that may provide abatement at costs between 80 and 214 USD per ton.[4] Finally, a recent report from the Clean Air Task Force illustrates how the deployment of CCS at operations in California and Texas cost between 60 and 132 USD per ton.[5] Current and future allowance prices would substantially contribute to CCS deployment, especially when considering that cost levels will continue to drop as CCS developers gain experience and when accounting for unprecedented funding opportunities available through the Inflation Reduction Act.[6] This finding is robust even *before* considering the substantial funding

[3] LLNL and CATF. 2023. "Sharing the Benefits: How the Economics of Carbon Capture and Storage Can Serve Communities, the Economy and the Climate." https://gs.llnl.gov/sites/gs/files/2023-05/ca-ccs-economic-study-report.pdf

[4] Boston Consulting Group. 2020. "Think Small to Unlock Carbon Capture's Big Potential."https://www.bcg.com/publications/2020/unlocking-carbon-captures-potential#:~:text=Carbon%20capture%20is%20potentially%20on,is%20mainstream%20and%20cost%20competitive.

[5] CATF. 2023. "Air Pollutant Reductions from Carbon Capture: An Analysis of the Air Quality and Public Health Benefits of Carbon Capture and Storage." https://www.catf.us/resource/air-pollutant-reductions-carbon-capture/#:~:text=The%20report's%20key%20findings%20are,point%20sources%20at%20these%20facilities.

[6] Boston Consulting Group. 2023. "Scaling Carbon Capture Won't Break the Bank." https://www.bcg.com/publications/2023/scaling-carbon-capture-technology-wont-break-bank#:~:text=BCG's%20work%20with%20the%20Oil,how%20the%20math%20works%20out.

for CCS deployment provided by the Inflation Reduction Act and highlighted in the 2022 Scoping Plan, including 9 billion USD in support for CCS and enhanced subsidies for CCS under 45Q.

Based on this analysis, it is possible that the 2022 Scoping Plan target of 202 million tons of abatement from CCS over the next 15 years is realized. If this occurs, then that level of abatement would be roughly sufficient to achieve more than half of a 40% Scenario, nearly one-third of a 48% Scenario, and one-fifth of a 55% Scenario. In any case, the contribution is substantial, underlying the importance of explicitly incorporating CCS into an updated round of economic modeling. The CCMC expects that analysis of DAC and hydrogen technologies would yield similar results, thereby further highlighting the importance of including these technologies in a subsequent round of economic modeling.

iii. Failure to Account for the Greenhouse Gas Reduction Fund

To date, nearly 10 billion USD of auction revenues have been reinvested through California Climate Investments, achieving an estimated 98 million metric tons of reductions in GHG emissions.[7] Presumably, a significant portion of these GHG reductions occur in sectors covered by the C&T Program. Therefore, it would be helpful to further understand the assumptions, if any, that are made surrounding how auction revenue is reinvested into GHG reducing projects. This is especially pertinent to consider in the context of a 15-year horizon, where auction revenues may arguably increase substantially.

b. The Modeling Approach

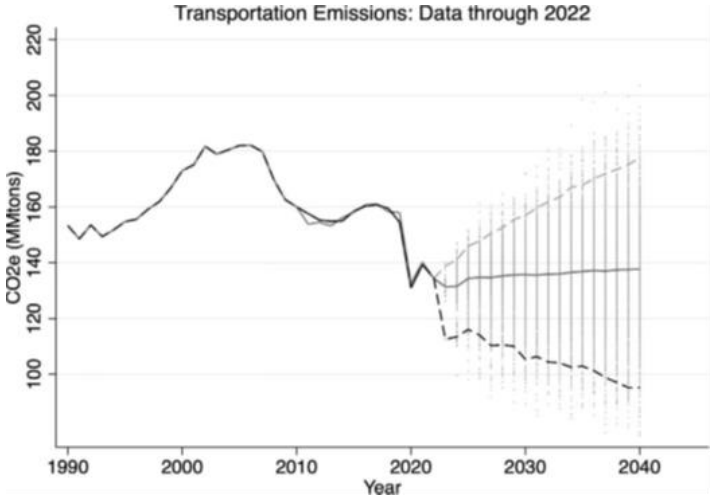
The UC Davis modeling team used a vector autoregression (VAR) model to forecast business-as-usual emissions through 2040 based on historical data from 1990-2022, then calculated net demand for abatement, and finally estimated price-responsive abatement caused by the carbon price in both 2030 and 2040. The team modeled one business as usual (BAU) scenario, which assumed no changes to the allowance budgets, and four “alternative” scenarios, which assumed various changes to the allowance budgets consistent with options outlined by CARB to date.

The advantage of VAR is that it is a flexible “theory-free” method of estimating relationships between GHG emissions and variables such as gross economic output and fossil fuel prices. The drawback of VAR is that it ignores inherent structural features of the underlying economic system, including dramatic policy and economic changes that occur over time. The CCMC questions whether VAR is the appropriate modeling approach in the context of California’s C&T Program. We argue that past statistical relationships do not inherently provide a sound technical basis for forecasting business-as-usual emissions. This is because most covered sectors in California’s C&T Program are undergoing fundamental changes driven by climate policies and economic transitions, thereby rendering observations of past relationships potentially irrelevant to predicting future emission levels.

[7]California Climate Investments. 2023. Annual Report dashboard. https://www.caclimateinvestments.ca.gov/annual-report

We illustrate the drawback of using a VAR approach by focusing on the transportation sector, which represents 38 percent of California's GHG emissions. As illustrated below in Figure 3, the model forecasts an *increase* in business-as-usual emissions in the transportation sector, resulting in nearly 140 MMT of GHG emissions in 2040. However, this directly contrasts with the 2022 Scoping Plan's estimate for business-as-usual emissions from the transportation sector that substantially *decrease* over time, resulting in 93 MMT of GHG emissions in 2040. Overestimating forecasted emissions from the transportation sector, as the model seems to have done, would likely result in inflated price projections for allowance prices, all else equal.

Figure 3
Business-As-Usual Estimate for Transportation Sector
Source: UC Davis Presentation, November 16 CARB Workshop



The approach taken by the UC Davis team makes an overly restrictive assumption that GHG reductions occur *only* through "reduced fuel use" and "fuel switching". In other words, the carbon price *only* leads to GHG reductions through lowered use of gasoline, electricity, or natural gas and/or switching that occurs across these fuels. This captures only a narrow subset of the pathways through which a carbon price causes GHG reductions. For example, the modeling approach ignores entire abatement pathways including changes to upstream energy supply such as CCS and DAC. Moreover, the modeling approach ignores fuel switching beyond the three fuels explicitly considered, such that a range of alternative clean fuels are effectively ignored. These omissions are at odds with CARB's 2022 Scoping Plan, which relies heavily on changes to upstream energy supply and rapid expansion of new fuel types, including but not limited to hydrogen. Therefore, the CCMC expects these omissions resulted in substantial overestimations in the UC Davis allowance price projections, all else equal.

c. Request for Updated or Alternative Modeling

The CCMC recommends changing or at least augmenting the existing modeling approach. We expect these changes and augmentations would yield significantly lower allowance price projections.

Ideally, a comprehensive change to the modeling approach would include:

- Explicit incorporation of a marginal abatement cost curve that includes all known abatement pathways. A revised modeling approach along these lines has been implemented in a wide range of other studies and is entirely feasible (e.g., See Evolved Energy Research. 2021. Marginal Abatement Cost Curves for U.S. Net-Zero Energy Systems. Prepared for Environmental Defense Fund). This approach could either entirely replace or act additively to the VAR methodology employed by UC Davis.
- A broader treatment of "price sensitive" abatement that responds to the allowance price. For example, during the workshop, Dr. Bushnell said that if he were to incorporate CCS deployment into his model, then it would show up as "price insensitive" abatement. Taking this approach would substantially undercount the abatement caused by the C&T Program. In short, the C&T Program facilitates the success of many complementary policies and climate targets, and the modeling should reflect this reality.
- Accounting for uncertainty regarding whether policies/targets outlined in the 2022 Scoping Plan are likely to be met or exceeded, rather than simply assuming that they will be fully implemented. This is important because the Scoping Plan is a planning document rather than a series of mandates and rules, meaning there is substantial uncertainty regarding whether it is implemented exactly as envisioned.

Practically, marginal and targeted changes to the modeling should include:

- Projections through 2045 rather than 2040 for consistency with California's climate goals under Assembly Bill 1279.
- Representation of a wide array of fuel switching options (beyond electricity, gasoline, and natural gas) to more accurately reflect technologies likely to be incentivized by the carbon price.
- Incorporation of abatement technologies that play an important role in the 2022 Scoping Plan (CCS, DAC, hydrogen) and abatement from auctioned allowances to more accurately reflect California's climate policy mix.

4. The CCMC Recommends Maintaining Existing Banking Rules

At the November 16 Workshop, CARB asked whether changes to market rules could enhance liquidity and protect against price volatility, and outlined potential changes to consider, including:

- Modified banking rules
- Minimum trade activity requirements
- Duration limits on allowance holdings

The CCMC does not believe CARB needs to modify banking rules, impose minimum trade activity requirements, or impose duration limits on allowance holdings. We explain why below while addressing the following observations from the November 16 Workshop:

- There has been a steady increase of market participants over time, illustrative of current market conditions.

- Long-term allowance holdings or investments may reduce market liquidity considering the potential reductions in allowances.
- There is no current duration limit on holding allowances or a time limit to using allowances.

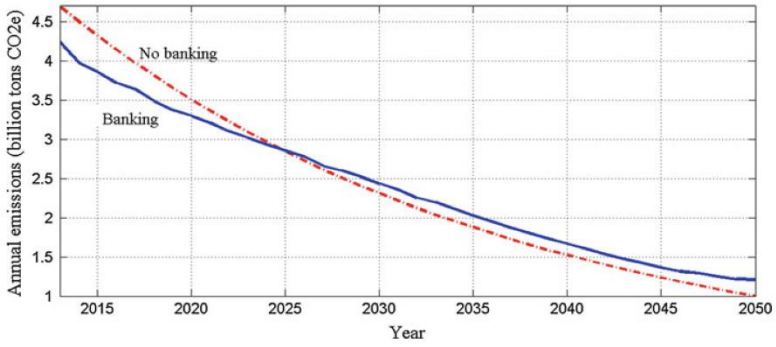
a. CARB's Current Banking Rules Reflect Sound Program Design and Incentivize Early Emission Reductions

The CCMC fully concurs with CARB's description of the benefits of banking, which we reiterate here. As noted by CARB at the November 16 Workshop, CARB's current banking rules help to (1) reduce compliance costs and mitigate concerns about price volatility, (2) create compliance flexibility, (3) incentivize early emission reductions, and (4) encourage a long-term commitment from market participants. To quote Dr. Dallas Burtraw, Co-Chair of the IEMAC, "every successful program has enabled emissions banking; and indeed the exception proves the rule." (Legal Planet, 2017).[8]

We would like to especially emphasize point #3 above, that allowance banking incentivizes early reductions in GHG emissions. Leard (2013) argues that allowance banking improves economic welfare by leading to lower emissions in the short run. Compared to a C&T program without banking, cumulative reductions over time remain unchanged, but more reductions occur earlier on, leading to an "environmental dividend".[9] Figure 4 below illustrates this result in the context of a simulation for a national C&T program in the United States.

The CCMC would further note that a focus on cumulative rather than annual emissions is appropriate. This view is consistent with the 2021 Independent Emissions Market Advisory Committee (IEMAC) report which states: "the main greenhouse gas, carbon dioxide, is known as a stock pollutant. For stock pollutants, what matters most is the cumulative total of emissions, not the rate of emissions at a particular point in time." This is also reflective of best practice from a climate science perspective, which argues for setting cumulative rather than annual targets since cumulative emissions map more directly into global temperature changes.[10]

Figure 4
Emissions With and Without Allowance Banking Under a National C&T Program
Source: Leard (2013)



[8] Burtraw, Dallas. 2017. "Three Revisions Not to Overlook in California's New Cap-and-Trade Proposal, SB 775." Legal Planet. https://legal-planet.org/2017/05/10/guest-blogger-dallas-burtraw-three-revisions-not-to-overlook-in-californias-new-cap-and-trade-proposal-sb-775/

[9] Leard, Benjamin. 2013. "The Welfare Effects of Allowance Banking in Emissions Trading Programs." *Environmental and Resource Economics* 55: 175-197.

[10] Gianfranco, Chicco and Paule M. Stephenson. 2012. "Effectiveness of Setting Cumulative Carbon Dioxide Emissions Reduction Targets." Energy 42(1): 19-31.

b. Banking Restrictions Have Introduced Significant Price Volatility and Led to Underperformance in Other Programs

Beyond the theory of allowance banking, the CCMC highlights the following real-world examples that demonstrate that carbon markets without banking or with restrictions on banking face volatility and underperformance.

Example 1. In 1994, the South Coast Air Quality Management District launched the Regional Clean Air Incentives Market (RECLAIM), the first large-scale urban regional cap-and-trade program for NOx. The program did not allow covered sources to bank allowances for future use; rather, allowances had to be used in the year that they were allocated. That market faced price spikes (from $1 to $60/allowance in the span of one year) as a result of a tightening cap and demand that outpaced supply. As observed by Burtraw et al. (2009) "Had banking been allowed, sources with low-cost abatement options would have had an incentive to adopt them early and retain the allowances for future periods. Banking gives sources a greater incentive to think about their long-term position in the market.[11]"

Example 2. EU ETS prices oscillated in the first pilot period (2005-2007) in part due to certain restrictions on banking. Specifically, there was a drop in allowance prices in response to the inability to bank allowances for use in the second period (2008-2012). Ellerman et. al (2008) characterize this inability to bank between periods as "one of the major design flaws of the trial period," further observing that banking helps dampen price volatility.[12]

Example 3. The South Korea emissions trading system has experienced substantial volatility from near $0 to over $30 primarily due to low liquidity caused by a combination of restrictions on allowance banking and limitations on voluntary participation.

c. Increased Market Participation and Long-Term Allowance Holdings Contribute to Rather Than Hamper Market Liquidity.

The "steady increase of market participants over time" observed by CARB has in our view been a key contributor to market liquidity and efficiency as evidenced by available data. For example, to date, auctions seem to be more competitive when voluntarily associated entities participate, as evidenced by the Herfindahl-Hirschman Index (HHI), which is a "common measure of market concentration used to express competitiveness."[13] Consistent with recent HHI data, market trading also appears to be higher, rather than lower, as more voluntarily associated entities joined the market. For example, from 2014 to 2015, average market transfers were in the range of 150 million allowances in contrast to 380 million allowances in 2022. In addition, because compliance entities are the only natural buyers of allowances, their future demand will be met so long as there

[11] Burtraw, Dallas and Sara Jo Szambelan. 2009. "U.S. Emissions Trading Markets for SO2 and NOx", Resources for the Future. https://media.rff.org/documents/RFF-DP-09-40.pdf

[12] Ellerman, Denny and Paul Joskow. 2008. "The European Union's Emissions Trading System in Perspective." Massachusetts Institute of Technology.https://economics.mit.edu/sites/default/files/2022-09/EU%20Emissions%20Trading%20System%20in%20Perspective.pdf

[13] California Air Resources Board. 2023. Cap-and-Trade Program Data Dashboard. https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/program-data/cap-and-trade-program-data-dashboard

is sufficient supply. In other words, concerns about liquidity would actually be *more* present in a market with fewer market participants.

We are not familiar with any other benefits associated with imposing minimum trade activity requirements or imposing "duration limit on holding allowances or a time limit to using allowances." To the contrary, these restrictions would likely introduce distortions that could counteract the benefits of banking identified by CARB above. By way of example, a holding duration of 10 years would lead to a devaluation of older allowance vintages, introducing differentiation between what are supposed to be fungible allowances. The result would be a reduction in certainty and credibility that would likely stymy rather than promote further liquidity.

d. A More Stringent Cap Calls for Banking Flexibility

Changing the stringency of the Program does not call for changes to the banking rules or restrictions on banking. To the contrary, these banking rules are ever more important in the context of a tighter cap to ensure the benefits mentioned above continue to be felt by the market. The potential changes identified by CARB limit rather than enhance liquidity and price volatility and should not be implemented.

5. Conclusion

We thank CARB for the opportunity to comment on this public workshop. We look forward to engaging with Staff on the concepts contained within this comment letter and to future engagement through additional public workshops.

Sincerely,

Clayton Munnings
Co-Founder
Elevate Climate

Alicia Robinson
Co-Founder
Elevate Climate

CALIFORNIA CARBON MARKET COLLABORATIVE
COMMENT LETTER TO CARB
26 OCTOBER 2023

Re: California Carbon Market Collaborative Comments on CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Regulations

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 5 October 2023. This comment letter should be read in conjunction with our letter dated 17 August 2023, submitted in response to CARB's workshop on 27 July 2023.

Elevate Climate convenes the CCMC in support of the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC gathers a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.

1. The CCMC Reiterates Support for the 48% by 2030 Scenario at the Minimum

The CCMC supports the C&T Program playing an increasing role in California's overall climate policy mix over time. As stated in our 17 August 2023 letter[1] the CCMC believes that the C&T Program is uniquely positioned among the state's suite of climate policies to lead the achievement of ambitious climate targets because it improves emissions certainty, aligns economic incentives, and can further enhance environmental justice. For these reasons, the CCMC continues to support the 48% by 2030 Scenario and remains interested in reviewing any modeling results for the 55% by 2030 Scenario.

Lower Cap Levels Imply Local Air Emissions Reductions

The CCMC believes that lower cap levels imply local air emissions reductions, thereby supporting environmental justice outcomes. Academics have studied and discussed this relationship extensively. For example, Cushing et al. (2016)[2] explain that "as regulated industries adapt to future reductions in the emissions caps, California is likely to see more reductions in localized greenhouse gas emissions and co-pollutant emissions". The best empirical evidence we have to date is that the California Cap-and-Trade Program has indeed reduced local air emissions, where Hernandez-Cortes and Meng (2023)[3] find that "during 2012–2017, the C&T program reduced emissions annually at a rate of 9%, 5%, 4%, and 3% for GHG, PM2.5, PM10, and NOx, respectively, for the average sample regulated facility." Similarly, Sheriff (2023) finds that "minority

[1] California Carbon Market Collaborative Comment Letter Submitted to the California Air Resources on 17 August 2023. Available here.
[2] Cushing, Lara, Wander, Madeline, Morello-Frosch, Rachel, Pastor, Manuel, Zhu, Allen and James Sadd. 2016. "A Preliminary Environmental Equity Assessment of California's Cap-and-Trade Program". Research Brief by UC Berkeley, Occidental College, and USC. Available here.
[3] Hernandez-Cortes, Danae and Kyle Meng. 2023. "Do Environmental Markets Cause Environmental Injustice? Evidence from California's Carbon Market." *Journal of Public Economics* 217: 104786. Available here.

communities experienced a relative reduction in cumulative exposure from [air toxics]" caused by the California Cap-and-Trade Program.[4] While these outcomes are not guaranteed and may vary over time, the overall weight of evidence in California provides sufficient grounds to posit that lower cap levels imply local air emission reductions. There are many other options for reducing local air emissions that are also worthy of further consideration.[5] However, given the scope and timing of the informal workshop, the CCMC believes that ensuring a 48% Scenario at minimum is a focused and pragmatic approach for ensuring that the forthcoming Cap-and-Trade Program rulemaking supports further environmental justice outcomes by 2025 at the latest.

Request for Additional Modeling Runs Facilitative of Increased Ambition

The two Options presented at the workshop pose significant tradeoffs. The CCMC observes that the Emission Target Method ("Option #1") increases 2031 budgets from the 2030 annual cap. While the estimated cumulative 2031-2045 allowance budget under Option #1 is similar to the estimated covered emissions under the Scoping Plan, we note that it is atypical for budgets to increase relative to the prior year's cap. The CCMC further observes that the Allowance Budget Method ("Option #2") supports greater climate ambition than called for in the Scoping Plan because it delivers greater cumulative reductions relative to Option #1 and creates a steeper near-term budget reduction trajectory in the 2031-2045 period. These Options are difficult to assess without further economic modeling that estimates allowance prices under each combination of Scenarios and Options. For that reason, we are especially looking forward to learning more about CARB's economic modeling during the upcoming California-Quebec public workshop on November 16th, which was just recently announced.

In addition, the CCMC recommends consideration of additional modeling runs that may facilitate increased ambition including, but not limited to, the following:

- For Option 1, allocating some post-2030 allowances to the price containment reserve so that cap trajectories don't necessarily snap back to a higher level than previous years.
- For any Scenario or Option combination, using an emissions containment reserve to "flex" toward more ambitious climate targets. For example, as we outline in our letter submitted on August 17, the cap trajectory could be set as ambitiously as CARB deems feasible and CARB could then take an additional protective step of designing an emission containment reserve to withhold allowances from the market if prices are persistently low. Leveraged in this way, the emissions containment reserve would serve as an insurance policy, automatically adjusting allowance supply if the selected cap trajectory ends up being not as ambitious as expected. In contrast, if the cap is indeed as ambitious as expected, then the emissions containment reserve will release its allowances to the market and therefore cap trajectories will remain unchanged. This approach would be especially prudent given the high uncertainty over business-as-usual emissions in California due to a number of factors including complementary policies (Borenstein et al., 2019).[6]

[4] Sheriff, Glen. 2023. "California's GHG Cap and Trade Program and the Equity of Air Toxic Releases". *Journal of the Association of Environmental and Resource Economists*. Available here.
[5] Including, but not limited to, more funding for air quality policies and targeted funding for projects that reduce local air emissions. These and other approaches have been discussed at recent meetings of the Environmental Justice Advisory Committee and the Independent Emissions Market Advisory Committee.
[6] Borenstein, Severin, Bushnell, James, Wolak, Frank A., and Matthew Zaragoza-Watkins. 2019. "Expecting the Unexpected: Emissions Uncertainty and Environmental Market Design". *American Economic Review*: 109(11): 3953-77.

2. CARB Should Prioritize Ambition and Equity When Selecting Pools from Which to Retire Allowances

The CCMC encourages CARB to prioritize removals from allowance pools that lead directly to increased ambition of the cap-and-trade program while also supporting equity by protecting low-income households from higher allowance prices.

Prioritize Allowance Removals Which Enhance Ambition

Table 1 reflects the CCMC's initial assessment of the impact of removing allowances from specific pools on ambition. This initial assessment suggests that removing allowances from the following pools has the following estimated impact on ambition:

- A *certain* increase in ambition from removals in allocated and auctioned allowance pools;
- A *potential* increase in ambition from removals in price containment reserve allowance pools *if and when* trigger prices are reached; and,
- A *potential and uncertain* increase in ambition from removals in the price ceiling *if and when* trigger prices are reached and *depending on* how any monies from "price ceiling unit" sales are used to reduce emissions.

Table 1
Removals from Allowance Pools and Estimated Impact on Ambition

Pool	Allowance Pool	Impact on Ambition
Price Ceiling	~78 Million	Per § 95915 of the Cap-and-Trade Regulation, allowances in the price ceiling are retired. Removals of these allowances only increase ambition if and when the price ceiling is triggered. After the allowances at the price ceiling are exhausted, price ceiling units are issued by CARB and any resulting monies are spent by CARB to achieve emissions reductions on "at least a metric ton for metric ton basis". The ultimate impact on ambition is therefore uncertain partly because there is uncertainty over precisely how CARB would spend any resulting monies.
Price Containment Reserve	~156 Million	Removal only leads to emissions reductions if and when the containment reserve is triggered.
Allocation and Auctions	~1,373 Million	Removal directly leads to emissions reductions.

Maintain and Improve Allowance Allocations Which Protect and Support Equity

The CCMC encourages CARB to maintain allowance pools that support equity. For example, allocations to utilities that fund the California Climate Credit, which takes proceeds from allowance

sales and returns them as lump-sum distributions[7] on residential gas and electric bills. Maintaining these allocations will further protect equity because increases in utility bills are particularly onerous on low-income households. Indeed, Borenstein et al. (2021)[8] argue that taxes on electricity are more regressive than taxes on gasoline or income. To further support equity, the CCMC notes that the California Climate Credit could be updated to increasingly target lump-sum distributions to low-income and/or disadvantaged electric and gas ratepayers to further channel revenue toward progressive outcomes.

Prioritizing Ambition and Equity While Balancing Tradeoffs

In conclusion, the CCMC urges CARB to prioritize ambition and equity when selecting which pools to remove allowances from, while acknowledging CARB's responsibility to balance the many tradeoffs highlighted in Assembly Bill 32 and Assembly Bill 398.

3. Conclusion

The CCMC thanks CARB for the opportunity to provide public comments. The CCMC also applauds CARB for the level of detail provided in recent informal Cap-and-Trade workshops, especially information related to post-2030 allowance budget scenarios which begins to speak to the future of California's carbon market.

Sincerely,

Clayton Munnings
Co-Founder
Elevate Climate

Alicia Robinson
Co-Founder
Elevate Climate

[7] This contrasts with distributions that scale with electricity consumption (sometimes called a "volumetric" distribution), which could disincentivize efforts to conserve electricity.
[8] Borenstein, Severin, Fowlie, Meredith and James Sallee. 2021. "Designing Electricity Rates for an Equitable Energy Transition". UC Berkeley Energy Institute Working Paper.

CALIFORNIA CARBON MARKET COLLABORATIVE COMMENT LETTER TO CARB 17 AUGUST 2023

Re: California Carbon Market Collaborative Comments on CARB's Informal Workshop on Potential Amendments to the Cap-and-Trade Regulation

The California Carbon Market Collaborative (CCMC) appreciates the opportunity to provide public comment on the California Air Resources Board's (CARB) informal workshop on potential amendments to the Cap-and-Trade (C&T) Program held on 27 July 2023.

The CCMC supports the design and implementation of an ambitious and equitable California C&T Program through 2045 and beyond. The CCMC convenes a wide array of C&T stakeholders to deepen mutual understanding and undertake careful examination of key Program design features. Participants of the CCMC include, among others, Environmental Defense Fund, Liminality Capital LP, and Pacific Gas & Electric.[1]

1. **The CCMC recommends prioritizing building out allowance budgets for 2031 to 2045 and beyond.**

The fundamental question facing California's C&T Program is whether it extends beyond 2030. Uncertainties around the existence of the Program beyond 2030 negatively impact California today by stymying long-term emissions-reducing infrastructure projects. Any further clarity CARB can provide on the future of the C&T Program beyond 2030 will deliver additional and immediate benefits to Californians through stronger and more predictable incentives to invest in emissions-reducing infrastructure projects.

An indication of future allowance budgets between 2031 and 2045 would also paint a more complete and accurate picture of the expected role for the C&T Program in achieving California's 2045 climate target. In turn, indicative post-2030 allowance budgets would provide a robust foundation for making decisions about pre-2030 allowance budgets. The CCMC recommends prioritizing building out allowance budgets for 2031 to 2045 and beyond ahead of any formal rulemaking.

It is worth nothing that if CARB extends the C&T Program through 2045 and beyond, then California would provide the certainty necessary for investors to stack carbon market incentives on top of funding from the federal Inflation Reduction Act. In short, an extended C&T Program in California would supercharge new federal subsidies to accelerate decarbonization efforts within our state.

2. **The CCMC supports the 48% by 2030 scenario and is interested in reviewing any modeling results for the 55% by 2030 scenario.**

As background, the CCMC supports the C&T Program playing an increasing role in California's overall climate policy mix over time because the C&T Program is uniquely positioned among the

[1] The CCMC is convened by Elevate Climate, a company dedicated to strengthening carbon markets through analysis and facilitation. For more information on the CCMC, please email alicia@elevateclimate.com.

state's suite of climate policies to lead the achievement of ambitious climate targets for the following reasons.

- Emissions Certainty: The C&T Program responds in real-time by increasing abatement if other policies fail to hit their expected abatement goals. Underperformance of other policies already occurs and may increase as California's climate targets become more ambitious. In this context, the C&T Program provides much needed reassurance by reducing the uncertainty of emissions reductions across California's climate policy mix and thereby improving the likelihood of achieving climate targets.
- Economic Incentives: Compared to direct regulations, technology standards, or government subsidies, an increasing role for a well-designed C&T Program means that California can reduce more emissions more quickly because the market identifies least-cost emissions reductions and incentives emissions-reducing innovations.
- Environmental Justice: According to data provided by the State of California, $6.7 billion of the $9 billion in cap-and-trade revenue implemented by the Legislature since 2013 has benefited disadvantaged and low-income communities and households.[2] In 2022 alone, revenues from the C&T Program were used to implement nearly 19,500 new projects through $1.3 billion in funding, with $933 million of that funding directly benefiting disadvantaged communities and low-income communities and households.[3] In addition, independent academic analysis[4] indicates that the program has narrowed local air pollution disparities over the 2012 to 2017 timeframe, although this favorable outcome is not necessarily guaranteed over time and communities remain concerned over local air emissions. An ambitious well-designed C&T Program can further enhance equitable outcomes such as direct investments and improved local air emissions.

The CCMC supports the 48 percent by 2030 scenario with the adjustment in the emission inventory because cap levels should be aligned such that covered sources achieve at least their proportional share of abatement relative to uncovered sources called for by the 2022 Scoping Plan. If the C&T Program were to play a lesser role, then California would be put in the position of fighting to achieve the 2022 Scoping Plan goal with one hand tied behind its back.

The CCMC supports CARB's ongoing efforts to conduct economic modeling of the 55% by 2030 scenario. Information on the impact of proposed changes on allowance prices will not only inform preferences on scenario selection but also inspire ideas for alternative policy designs. The more information available ahead of the formal rulemaking the better.

3. The CCMC supports integrating high-quality carbon management into the existing C&T Program.

In light of recent passage of Assembly Bill 1279 and Senate Bill 905, and the significant reliance on carbon management in the 2022 Scoping Plan, it is crucial that high-quality management is properly accounted for and incentivized by the C&T Program. A market-based approach would allow for an efficient allocation between removals and reductions within the constraints imposed by Assembly Bill 1279, leading to more affordable outcomes. There are a number of recent

[2] California Climate Investments: https://www.caclimateinvestments.ca.gov/priority-populations.
[3] California Climate Investments: https://www.caclimateinvestments.ca.gov/.
[4] Hernandez-Cortes, Danae and Kyle C. Meng. 2023. "Do Environmental Markets Cause Environmental Injustice? Evidence from California's Carbon Market". *Journal of Public Economics* 217: 104786.

studies that outline an array of policy options for incorporating high-quality carbon management approaches into cap-and-trade programs, including a recent effort by the International Carbon Action Partnership.[5] The CCMC will convene with stakeholders to discuss which approach may be most suitable to California's context.

4. **The CCMC suggests incorporating further design details into CARB's modeling efforts.**

The benefits and costs of the scenarios under consideration depend not only on overall ambition but on a number of detailed policy design issues. The CCMC suggests modeling the impact of removing allowances from different pools of allowances for each scenario including retiring from the price ceiling and different combinations of auctioned and allocated allowances. Impacts should be described not only in economic terms (i.e., allowance price or overall cost) but also in environmental terms (e.g., does removing allowances from the pool under consideration lead to lower overall emission levels). More detailed modeling results would inform preferences on a number of policy issues including scenario choice, the design of price containment reserves, and consideration of an emissions containment reserve.

5. **The CCMC suggests modeling an alternative scenario for the Standardized Regulatory Impact Assessment.**

The typical process for a Standardized Regulatory Impact Assessment (SRIA) is not well-suited for the C&T Program given that it is an economy-wide market-based policy. Specifically, the "cost" of the C&T Program must be compared to what policy would achieve emissions reductions instead of the C&T Program. In theory and in practice, all other policies would be more expensive in terms of dollars per ton of emission reduced, as evidenced by many analyses and studies. Therefore, arguments for not fully relying on cap-and-trade need to be based on evidence unrelated to costs, such as adverse competitiveness impacts or emissions leakage rates. In this context, it is worth noting that command-and-control policies often create adverse competitiveness impacts and emissions leakage rates, which should be fully noted in any economic analysis undertaken by CARB.

The CCMC recommends modeling an alternative scenario when CARB begins the SRIA process. Given the substantial uncertainty surrounding the performance of regulatory policies, it may be useful to model an alternative scenario or set of scenarios that involves designs capable of adjusting to the *actual* performance of regulatory policies over time.

There are many potential alternative scenarios that may be worthwhile to model. Among these options, the CCMC highlights one example below that facilitates "flexing" between the 48% and 55% scenarios based on market outcomes, while noting that this example could be applied to other emissions scenarios.

An emission containment reserve could be considered such that if allowance prices at quarterly auctions sit at or below a predetermined trigger price, then a specified quantity of supply is withheld. The *maximum* quantity of supply withheld via an emissions containment reserve could be set equal to the difference between the 48% and 55% scenarios under consideration (125

[5] International Climate Action Partnership. 2021. Emissions Trading Systems and Net Zero: Trading Removals. Available here: https://icapcarbonaction.com/en/publications/emissions-trading-systems-and-net-zero-trading-removals.

million allowances = 2,340 allowances for 48% scenario minus 2,215 allowances for the 55% scenario).

- For example, if we assume that every one of the 24 auctions[6] between 2025 and 2031 triggers the emissions containment reserve, then 125 million allowances worth of supply would be withheld.
- As another example, if we assume that only one of these auctions triggers the emissions containment reserve, then ~5 million allowances (125 million allowances divided by 24 auctions) worth of supply would be withheld at a single auction.

Such a scenario is worthwhile to consider because it allows pre-2030 allowance budgets to adjust to the *actual* performance of regulatory policies, rather than setting pre-2030 allowance budgets based on *estimated* future performance of regulatory policies.

The difficulties in estimating the performance of regulatory policies nearly a decade into the future are virtually unsurmountable but the resulting uncertainty is easily addressed with a design approach that dynamically responds to market signals in real time.

Conclusion

The CCMC applauds CARB's leadership in updating California's C&T Program. We look forward to engaging with staff and stakeholders to ensure an ambitious and equitable Program through 2045 and beyond.

Sincerely,

Clayton Munnings
Co-Founder and CEO
Elevate Climate

Alicia Robinson
Co-Founder and COO
Elevate Climate

[6] Six years between 2025 when regulations may be adopted and 2031 when regulations expire multiplied by four auctions per year.