2025 ANNUAL REPORT OF THE INDEPENDENT EMISSIONS MARKET ADVISORY COMMITTEE

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Introduction

Since its formation in 2018, the Independent Emissions Market Advisory Committee (IEMAC) has been tasked with reporting annually to the California Air Resources Board (CARB) and the Joint Legislative Committee on Climate Change Policies. This 2025 annual report arrives at a consequential moment, as policymakers revisit and refine core elements of the state's carbon market architecture.

This past year, the California Legislature enacted AB 1207 and SB 840, formally extending the Cap-and-Invest Program through 2045 and directing a set of significant programmatic changes. CARB has since entered the formal rulemaking phase. The recently released Initial Statement of Reasons (ISOR) outlines a proposal to translate statutory directives into specific administrative rules. The proposal is open for public comment through March 9, 2026, with a final Board vote scheduled for May 28, 2026.

California's cap-and-invest program is being designed with multiple objectives in mind. At its core, it is designed to reduce California's greenhouse gas (GHG) emissions in line with statutory targets established under the California Global Warming Solutions Act of 2006 and subsequent legislation. At the same time, policymakers have directed CARB to respond to mounting affordability concerns, contain compliance costs, mitigate emissions leakage and adverse competitiveness effects for emissions-intensive, trade-exposed industries, and provide a model for other jurisdictions seeking to implement cost-effective climate policy.

Designing a single program to advance multiple objectives will inevitably involve hard trade-offs. Choices made in the coming months will shape environmental performance, compliance costs, distributional outcomes, competitiveness effects, and the long-term credibility and durability of the program. In this context, independent analysis has an important role to play.

IEMAC is comprised of five experts appointed by the Governor (three members), the Senate Rules Committee (one member), and the Speaker of the Assembly (one member), along with a non-voting representative from the Legislative Analyst's Office. We serve as a voluntary, uncompensated, and purely advisory body that is institutionally separate from both program implementation and day-to-day political negotiations. Because members bring diverse expertise and perspectives, committee deliberations often reflect differing views. We convene several times each year to review program developments, evaluate proposals against statutory objectives, anticipate unintended consequences and cross-objective tensions, assess consistency with long-run emissions trajectories and market design principles, and clarify the empirical basis—and areas of uncertainty—underlying key design decisions. Our role is not to advocate for particular constituencies, but to assess how alternative design choices are likely to perform relative to the state's stated goals.

This 2025 IEMAC report reflects our discussion and deliberations during a pivotal time when implementing agencies are working to design a cap-and-invest program that

aligns with statutory objectives. In past years, our annual reports have been organized around policy design features. This year, we elected to organize our report around the primary objectives and goals laid out in the reauthorization legislation: climate policy ambition; affordability; cost containment; leakage mitigation. The final chapter evaluates the policy design choices that determine program revenues. A brief summary of each chapter follows.

Ambition: With the ongoing rule-making process at the California Air Resources Board (CARB) and the recent re-authorization of the re-named Cap-and-Invest Program with the passage of AB 1207 (Irwin, 2025) and SB 840 (Limón, 2025) there are several aspects of climate ambition and environmental integrity that are timely to consider. Three are discussed here: annual allowance budgets currently under discussion at CARB, treatment of price ceiling revenue as directed by the Legislature, and updates to how the emissions cap is set with respect to offset use, also as directed by the Legislature. The chapter concludes with a recommendation to CARB to provide an analytical basis for proposed allowance budgets so the number of allowance removals can be better evaluated against program goals; a recommendation to the Legislature to evaluate trade-offs between consumer protections and environmental integrity in the event they need to appropriate price ceiling revenue and pursue both objectives; and a recommendation to CARB to adopt the staff proposal to implement the Legislature's direction to retire allowances equal to the number of offsets turned in for compliance.

Affordability: The legislature has asked CARB to reduce California GHG emissions in a manner that minimizes cost-of-living impacts and responds to mounting concerns about affordability. This chapter endorses restructuring the California Climate Credit (CCC) to reduce volumetric electricity rates rather than continuing lump-sum bill credits, as this would both improve affordability and correct price distortions that currently discourage electrification and other efficient fuel-switching decisions. If the primary objective is to promote building electrification, the reallocation of allowance value from natural gas utilities to electric utilities should be used to lower electricity rates across all months of the year—versus concentrated solely in summer. Finally, as higher carbon prices will increase natural gas and gasoline prices alongside other upward cost pressures, the chapter emphasizes the importance of transparent communication about expected price impacts and the limits of available revenues for offsetting them, in order to sustain public support for the state's climate policy framework.

Leakage mitigation: California's cap-and-invest program relies on free, output-based allowance allocations to mitigate emissions leakage and economic leakage within emissions-intensive, trade-exposed (EITE) industrial sectors. A carbon price coupled with a well-calibrated subsidy can be a very effective way to mitigate leakage. But this leakage mitigation comes at some opportunity cost (allowance value could be put to an alternative use) and an abatement cost (output-based incentives shift more of the abatement responsibility onto other sectors that do not receive the subsidy). Output-based subsidies should ideally be calibrated to balance costs with leakage mitigation

benefits. Along these lines, the authors recommend that CARB publicly review and update industrial leakage risk classifications and allocation parameters based on the latest evidence to ensure transparency.

Cost containment: California's cap-and-invest program is a cost-effective approach to reducing greenhouse gas emissions, an increasingly important characteristic as affordability concerns increase. Price stability tools, in particular an Allowance Price Containment Reserve (APCR), Emissions Containment Reserve (ECR), or Market Stability Reserve (MSR) can aid in containing system costs. Offsets contain costs for specific regulated entities, and CARB should provide an assessment as to why offsets may not be fully used and whether there should be any related policy intervention, such as the creation of an offset "buyer's club" for entities with low emissions as this may reduce costs. Although linkage opportunities are limited, and CARB is not considering any during this rulemaking, California should remain opportunistic about future linkages.

Revenue: One of the functions of the cap-and-invest program is to generate revenue for state investments. Policymakers recently revised their spending priorities for the Greenhouse Gas Reduction Fund (GGRF) in SB 840, which contemplates about $4.35 billion in annual spending commitments. GGRF revenue depends on the number of state-owned allowances sold and the prices they receive at auction. Both parameters are uncertain. Program regulations do not specify the number of state-owned allowances, which depends on the number of allowances freely allocated to utilities and industrial emitters. The IEMAC observes that it is difficult to independently evaluate projections of potential GGRF revenue due to the limited technical information made available in the January 2026 CARB staff proposal. However, the staff proposal projects GGRF revenues will never reach the levels specified in SB 840 and will instead steadily decline each year going forward, even at assumed allowance prices that are substantially higher than recent auction outcomes. The IEMAC observes a substantial disconnect between the GGRF revenue scenario analyzed in the January 2026 staff proposal and the spending contemplated in SB 840.

Environmental Ambition & Integrity

Katelyn Roedner Sutter and Brian Holt

As California positions itself as a global climate leader, the level of ambition and integrity of its climate policies take on additional importance and scrutiny. Ambition refers to whether or not climate policy is sufficiently aggressive to achieve the emission outcomes the state is requiring on a timeline to meet California's statutory targets, and integrity - in this case - referring very generally to the quality of climate policy in terms of keeping the climate whole.

With the ongoing rule-making process at the California Air Resources Board (CARB) and the recent re-authorization of the re-named Cap-and-Invest Program with the passage of AB 1207 (Irwin, 2025) and SB 840 (Limón, 2025) there are several aspects of climate ambition and environmental integrity that are timely to consider. Three are discussed here: annual allowance budgets currently under discussion at CARB, treatment of price ceiling revenue as directed by the Legislature, and updates to how the emissions cap is set with respect to offset use, also as directed by the Legislature.

Cap-and-Invest reauthorization and the rule-making process reflect the current political tension between climate ambition, leakage mitigation, and consumer protection. While the Cap-and-Invest Program is inherently a climate policy, and both the Legislature in its adoption of AB 32 (Pavley, 2006) and CARB's interpretation make clear that reducing greenhouse gas emissions is the goal, the Legislature was also clear in reauthorizing the program that they expect CARB to also address affordability. CARB is also clear in their Initial Statement of Reasons that they are seeking to achieve a balance. The discussion [and recommendations] that follow seek to acknowledge this, while recognizing that Cap and Invest is first a climate program intending to reduce greenhouse gas emissions.

Allowance Budgets

CARB is in the midst of an ongoing regulatory process to update the Cap-and-Invest Program. This process began in Summer of 2023 and CARB's most recent timeline indicates they intend to conclude in May 2026. Initially this process was mainly to consider tightening the emissions cap pre-2031 through smaller annual allowance budgets, but has now expanded to include implementing many of the design changes directed by the adoption of AB 1207.

The quantity of allowances in the annual budget is what supports the emissions cap - there are fewer allowances in each year's budget which is what causes the cap to decline annually, though annual emissions can be higher due to the use of offsets and the ability to bank allowances. Importantly, the cap has to decline such that it meets the statutory targets - a provision clarified in AB 1207 which explicitly requires CARB to set the emissions limit to achieve legislatively-required greenhouse gas reduction goals.

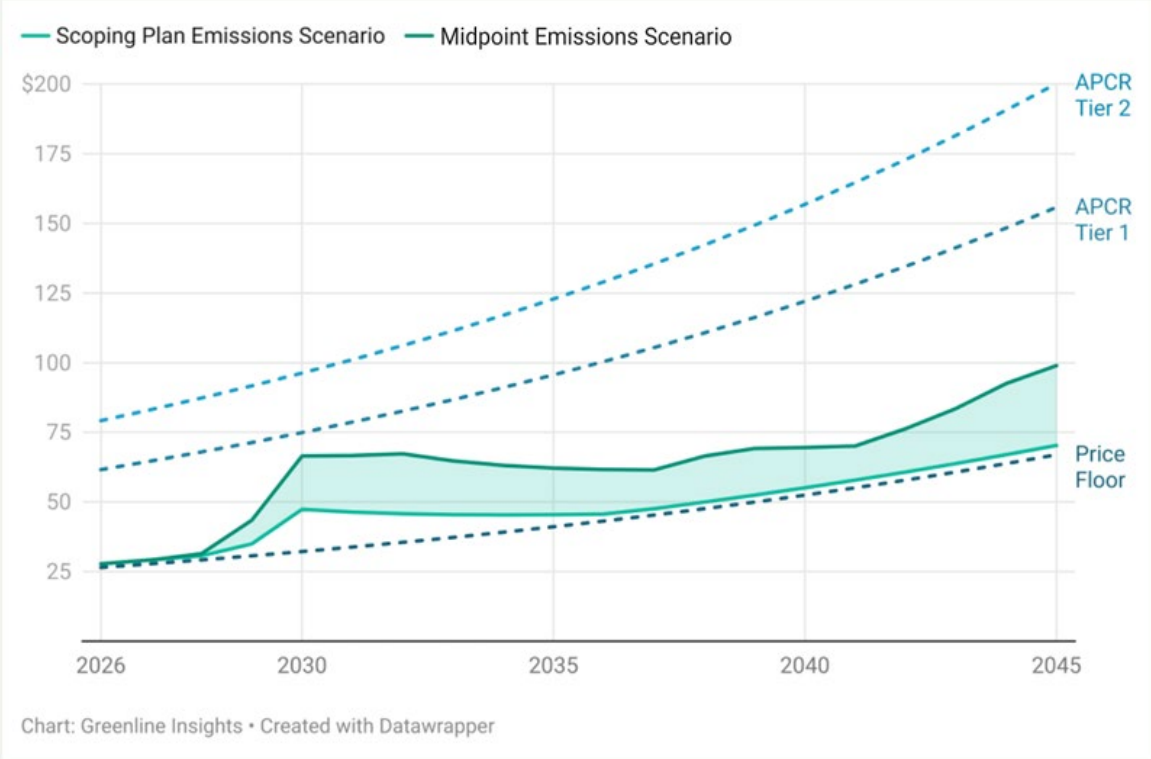
CARB has previously stated that in order for California to be on track to achieve the 2045 climate target of 85% reduction below the 1990 greenhouse gas emission level, based on the Scoping Plan scenario, the state needs to beat that 2030 target of 40% reduction below the 1990 greenhouse gas emission level. Instead, emissions should be 48% below the 1990 level in 2030 to put the state on a trajectory to 2045.

However, in the recently-released regulatory package, CARB has stepped far back from this acknowledgement and is recommending only the minimum reduction in allowance budgets, reflecting an update in emissions accounting methodology, to achieve the statutory 2030 target.,, CARB had previously hinted at this retrenchment in near-term ambition in the October 2025 workshop, and while they had never committed to the increased near-term ambition they described as necessary to meeting the mid-century target, this scenario appears off the table with CARB citing the lost time over the last few years as well as the loss of federal incentive funding.

While balancing the very obvious time constraints, the need to support market certainty and stability, cost containment, leakage mitigation and the statutory need to set a cap aligned with the climate targets, CARB should consider how to cost-effectively maximize climate ambition in the near-term to ensure California has the greatest likelihood of achieving the 2045 target, as envisioned in the 2022 Climate Change Scoping Plan and supported by the Standardized Regulatory Impact Assessment of the Regulation for the California Cap on Greenhouse Gas Emissions and Market Based Compliance Mechanisms 2024 Amendments.

One option to better align the Cap-and-Invest Program ambition with the state’s climate targets, as commissioned by the Environmental Defense Fund and modeled by Greenline Insights, is to modestly increase the number of allowances removed from annual budgets pre-2031., This “Higher Ambition scenario” not only increases the near-term reductions by removing approximately 154 million allowances, rather than 118 million, as proposed by CARB’s regulatory update, but is designed, based on the modeling structure and assumptions, to avoid hitting any price containment points post-2031 to provide market stability and maintain affordability. This scenario does still fall short of the estimated 265 million allowances CARB projected would need to be removed to achieve the Scoping Plan-aligned 48% reduction below 1990 emissions level, but does provide a smooth transition between pre- and post-2031 allowance budgets and declines linearly to the approximately 30 million tons CARB estimates will be the 2045 allowance budget.

Figure 7. Allowance Price Projections Under a Higher Ambition Scenario, $/MTCO$_2$e



https://www.greenlineinsights.com/carb-oct-29th-workshop-analytical-response-2025
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The Higher Ambition scenario includes a somewhat more pessimistic emissions trajectory than CARB's 2022 Scoping Plan (the "midpoint emissions scenario" in the figure above), reflecting realized or potential changes in federal policies. Importantly, under this and all scenarios considered by Greenline, "household impacts remain modest and progressively distributed, with lower-income households ($70k or less in annual income) consistently experiencing net benefits on average."

Some members of the IEMAC note that while studies like the one from Greenline Insights are useful and contribute to a better understanding of potential future market conditions, projecting carbon price responses to potential market design decisions is an uncertain task. Other analyses with different assumptions have found higher carbon price responses. Given the limited empirical information that is available to inform and assess key modeling assumptions — as well as fundamental uncertainty about future macroeconomic conditions, technological change, and federal policy choices might evolve — it is difficult to confidently express a view about likely future market prices. The IEMAC notes that because the Initial Statement of Reasons does not quantitatively

evaluate the potential impact of market design choices on allowance prices, it is necessary to rely on third-party analysis to address these questions.

The current Standardized Regulatory Impact Assessment and proposed regulatory order indicate that the proposed allowances budgets reflect an 11% average annual cap decline reflecting an approximate doubling in year over year ambition compared to the current program. CARB's regulation and any modifications in annual ambition will need to commensurately balance cost-containment for households and leakage protection (see chapter 4 on leakage).

Emissions Cap & Price Ceiling

Within California's suite of climate policies, the Cap-and-Invest Program plays a unique role. Unlike a procurement standard or a technology standard, which California also necessarily relies on, a well-designed "cap" in "Cap-and-Invest" places a limit on the climate pollution emitted into the atmosphere. This cap acts as a backstop on emissions. That is, other programs may achieve significant or fewer greenhouse gas emission reductions, but regardless of their performance, the cap continues to decline and when well-designed provides as much certainty as possible that California will meet its climate targets.

More specifically, the cap provides quantitative emissions certainty by setting a declining number of allowances issued annually - each representing one ton of greenhouse gas emissions. The price of these allowances is determined by the market. This is unlike a carbon tax where there is price certainty, but no quantitative limit on pollution. California's system includes design elements from both approaches, which helps to balance the importance of emissions certainty so California can achieve its statutory goals with the need to maintain cost-containment and consumer affordability. Specifically, should California's allowance price reach the price ceiling, the program would act as a carbon tax with a set price and unlimited quantity.

With respect to achieving specific emissions outcomes - in this case, California's statutory 2030 and 2045 emission targets - the emissions cap is the most important part of the Cap-and-Invest Program. But for it to be the binding limit on pollution it is intended to be, it needs to have integrity. If the cap were the roof of a building it would also need to have integrity - be well-designed so it doesn't fall down and a safe and effective barrier between what is under the roof and outside the roof. Maintaining the environmental integrity of the emissions cap should be an essential consideration in making legislative or regulatory updates to the Cap-and-Invest Program.

With the passage of AB 398 (Garcia) in 2017, the California Legislature established a price ceiling in the Cap-and-Invest Program. This is a maximum price for auctioned allowances which rises each year at a rate of 5% plus inflation. This was an important priority for compliance entities seeking greater price certainty and cost-containment features within the market-based system. Should the price ceiling be reached, the California Air Resources Board (CARB) issues "price ceiling units" (PCUs) sufficient to

cover any outstanding emission obligations by compliance entities. These PCUs are not bankable or tradeable, making them distinct from allowances. But they are also wholly separate from allowances in that they are not limited; CARB issues as many PCUs as it takes to cover any emissions. This would inherently eliminate the cap on pollution with unlimited PCUs.

AB 398 addressed the need for greater price certainty coupled with environmental integrity with a specific approach. The sale of PCUs would generate revenue, and that revenue was required to be used to purchase additional emission reductions on at least a ton-for-ton basis. For example, if CARB has to issue 1 million PCUs, representing 1 million tons of emissions beyond annual allowance budget, thus exceeding the emissions cap, then the revenue from that 1 million PCUs must go to purchase at least 1 million tons of emission reductions. While the text of AB 398 was not explicit, this is commonly assumed to be purchasing carbon offsets, as the statutory criteria for the price ceiling and the regulation of offsets are nearly identical.

In 2025, the Legislature adopted AB 1207 which, among many other provisions, removed the AB 398 language providing for the purchase of emission reductions on at least a ton-for-ton basis. Instead, it requires that the revenue "be available, upon appropriation 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 desire for this measure is understandable given the significant focus from the Legislature and Administration on household affordability. However, this change potentially negates the environmental integrity protections for the emissions cap at the price ceiling which could allow for essentially unlimited greenhouse gas emissions with no steps to offset or otherwise make up for this excess pollution elsewhere.

However, in appropriating these funds and in updating the regulation to reflect Legislative direction, the Legislature and CARB have an opportunity to *both* support California households *and* maintain environmental integrity. That is, if implemented well, the market can continue to avoid unlimited climate emissions at the price ceiling while also providing important consumer protections. There are likely many potential approaches, which are not mutually exclusive, and a few are described here.

1. *Quantified reductions from ZEV and building electrification investments.* AB 1207 specifically mentions funding the transition to zero-emission vehicles and household energy efficiency as potential options for price ceiling revenue.

   If CARB quantified the emission reductions from these expenditures - the number of internal combustion vehicles replaced by additional (i.e. incentive-induced) ZEVs and their associated emissions, or the number of additional electric heat pumps installed and those associated emissions - they could identify any potential gap between emissions above the cap (represented by PCUs) and the

tons of abatement expected from the revenue expenditures. Ideally, expenditures would be designed and targeted in such a way that avoids such an emissions gap. For example, this could mean targeting ZEV incentives toward heavy-duty vehicles which have an outsized emissions impact or targeting replacement of the oldest, most-polluting light-duty vehicles. CARB would need to verify that the funded activity - replacing a vehicle or installing a new heat pump in this scenario - actually took place. CARB would also need to make certain assumptions about which ZEV purchases or heat pump installations, for instance, would have happened without these additional subsidies - not all purchases or installations could be assumed to have happened because of the investment of this revenue. Accordingly, it could be challenging to ensure these investments fully close any potential gap between emissions above the cap and the tons of expected abatement, but it would be directionally consistent with preserving environmental integrity and providing consumer benefits.

The Legislature and CARB, in their respective roles, should seek to target these rebates to avoid emissions above the cap at the price ceiling and accurately quantify the reductions from the investments to help avoid any gap between excess and reduced emissions. This is likely a greater administrative burden for CARB, but much of that could be mitigated by relying on existing incentive program infrastructure such as Clean Cars 4 All, the Heavy Duty Incentive Program or the Equitable Building Decarbonization Program at the California Energy Commission.

2. *Quantified reductions from nature-based climate solutions*. Another approach would be for the Legislature to appropriate funding from the sale of PCUs for investment in nature-based climate solutions. Not only does AB 1207 allow for expenditures beyond energy-efficiency and ZEV funding, but the Legislature added “nature-based climate solutions” to its list of priority funding categories for the use of auction revenue. While Greenhouse Gas Reduction Fund revenue is more fully addressed in SB 840, this is a meaningful indication of the Legislature’s intent to support such activities. SB 840 also directs CARB, as part of their offset study and report to the Legislature, include “recommendations for alternative valuation methodologies or criteria for instate offset projects, particularly projects that support the goals of Section 38561.5 of this code or subdivision (b) of Section 71450 of the Public Resources Code.” This is a reference to California nature-based climate solution targets and 30x30 conservation targets, respectively.

   One potential method of investing PCU revenue into quantifiable nature-based climate solutions could be an approach proposed by Pacific Forest Trust for “nature-based climate credits or similar approaches inclusive of Working Forest Conservation Easements.” This would build on existing mechanisms for establishing conservation easements, like those envisioned by PFT and the

CalFire Forest Legacy Program, while enabling the issuance of a new kind of credit to reflect the carbon sequestration of the legally-binding easement. These credits meet all of the same legal requirements of offsets, but they are selected by the state and can also be targeted to help meet other climate, conservation, and resilience goals. With PCU revenue, CARB could purchase nature-based climate credits, thus keeping the emissions cap "whole" and support climate adaptation and resilience benefits, biodiversity benefits, and climate mitigation within California.

3. *Existing compliance offsets.* A third approach would be to continue the status quo, with the Legislature appropriating some portion of the price ceiling revenue to purchase reductions to offset PCUs. This has the benefit of being the easiest to implement as the rules would require minimal updates and the offset protocols, quantification and verification methodologies are already approved. However, as IEMAC has discussed in several previous reports, there are numerous concerns with the efficacy and integrity of offsets themselves. With the protocol updates required in SB 840 - that all protocols be updated by 2029 and then every 5 years thereafter - some of these concerns could potentially be mitigated, though it is premature to judge how that effort might unfold at this time. When appropriating funds, the Legislature could place additional restrictions on the reductions purchased (for example, they must be in California or must be sold by Tribes).

Option	**Environmental benefits**	**Costs**	**Benefits to California consumers**
ZEV and building electrification	Need to address additionality (i.e., to exclude purchases that would have happened anyway) and emission quantification	Potentially higher than price ceiling (i.e., less than 1-for-1 reductions)	Targeted (but only those who receive support)
Nature-based climate solutions	Similar to offsets, though could be targeted in California	Potentially lower than price ceiling (i.e., could be 1-for-1)	Targeted (but only those who own or use supported land)

Option	Environmental benefits	Costs	Benefits to California consumers
Existing compliance offsets	Potentially meaningful but see prior IEMAC reports on offsets quality; offset reforms pending per AB 1207	Potentially lower than price ceiling (i.e., could be 1-for-1)	Limited and mostly out-of-state

These three options are not mutually exclusive - the Legislature could appropriate funds for myriad expenditures or combinations of expenditures that fall under the category of "climate mitigation" as named in AB 1207. The key is that CARB should be able to quantify and verify the emission reductions with the intent of supporting the environmental integrity of the cap.

Each of these options has drawbacks in terms of ease of implementation, but also in terms of assuming permanence or additionality. For instance, a zero-emission vehicle is certainly not permanent and it's hard to prove that it would not have been purchased *but for* the financial support from the sale of PCUs. However, these are the same concerns raised by some with the current offsetting system which would presumably have been used to procure the ton-for-ton reductions at the price ceiling under AB 398. Some combination of these approaches - or others that enable emission quantification and verification - would promote environmental integrity under the new price ceiling design specified in AB 1207 with at least some nexus to consumer benefits in some cases.

And while California's carbon market has never gotten close to the price ceiling, it is important to have this environmental integrity mechanism built in *before* potential price increases occur. It is also important to emphasize that consumer price impacts would be substantially higher if market prices reached the price ceiling, which is currently about $103/tCO2e in 2026 — about 3.5 times higher than the most recent auction which settled at the price floor of $27.94. All other things being equal, a higher price ceiling might counsel in favor of a greater focus on broad-based consumer rebates, whereas a lower price ceiling might counsel in favor of a focus on emission reductions and/or targeted investments, though the IEMAC notes that these choices are ultimately policy rather than technical decisions.

Allowance Retirement

Another aspect of AB 1207 that speaks to the Cap-and-Invest Program's ambition and environmental integrity is the provision to retire allowances equal to the number of offsets turned in for compliance. This is a modest but important enhancement of the ambition of the program by making the emissions cap lower than what it would

otherwise be. Using CARB's example data from 2022-2024, there would have transparently been a cumulative 26.2 million fewer allowances in the program following that compliance period. While CARB has in recent years provided more public explanation about how they have accounted for offset use previously when setting the cap, this direction from the Legislature makes it much more obvious and transparent.

In the recently-released regulatory package, CARB lays out how they propose to operationalize this design update. The language in AB 1207 is specifically annual in nature: "A number of allowances equal to the total number of offset credits used for compliance obligations in the prior year shall be removed from the next year's annual allowance budget and retired." In the staff's Initial Statement of Reasons, CARB rightly points out that this could lead to increased volatility in auction revenue as offset use is not smooth across years within a compliance period. CARB seeks to address this potential volatility while adhering to the direction for annual retirement by the Legislature by establishing a new jurisdictional holding account (an account owned and maintained by CARB), where they will annually place 6% of the allowance budget, representing the maximum potential offset use. CARB would then retire allowances from this account after every compliance period equal to the offsets turned in for compliance during the compliance period. Any allowances not retired due to offset use are transferred to the auction account. This appears to be a reasonable and thoughtful approach to adhere to the Legislature's apparent desire for greater transparency and ambition while minimizing annual volatility in auction supply and revenue.

Some committee members note that, as discussed in previous IEMAC reports, the decision to put offsets "under the cap" has the practical effect of reducing the number of allowances available at auction and therefore the amount of revenue raised for the Greenhouse Gas Reduction Fund. While this approach can help address concerns that the offsets program may not be achieving the environmental integrity provisions required by statute, it comes at the opportunity cost of GGRF funding. These impacts may be especially salient if the GGRF is never funded at the levels anticipated in SB 840 (see the Revenue chapter in this report).

Recommendations

1. In order to understand allowance budgets as proposed in the ISOR, CARB should provide an analytical basis for how the number of allowances removed corresponds to an expected emissions outcome (e.g. for 2030 or later) and demonstrate how that aligns with the achievement of the 2045 target. This would enable IEMAC and other stakeholders to evaluate how the proposal supports market certainty, cost-containment and the legislative direction to set a cap aligned with the climate targets, and if additional allowance removals are necessary.

2. In the event the Legislature needs to appropriate Price Ceiling Unit revenue, policymakers should look for opportunities to pursue environmental integrity and consumer benefits and evaluate the tradeoffs between those objectives.
3. CARB should adopt the staff's proposal to create a new jurisdictional holding account for allowances equal to the annual offset usage limit, and retire allowances from this account after each compliance period to reduce auction allowance and revenue volatility.

Energy Affordability

Meredith Fowlie and Danny Cullenward

As California commits to making deeper greenhouse gas (GHG) emissions reductions, concerns about “affordability” are mounting. The recently released Initial Statement of Reasons (ISOR) lays out the rationale for California’s Cap-and-Invest Program and proposes mechanisms and policy designs to implement the program. Throughout the ISOR, affordability concerns play an important role in defining both the why and the how of the carbon market re-authorization.

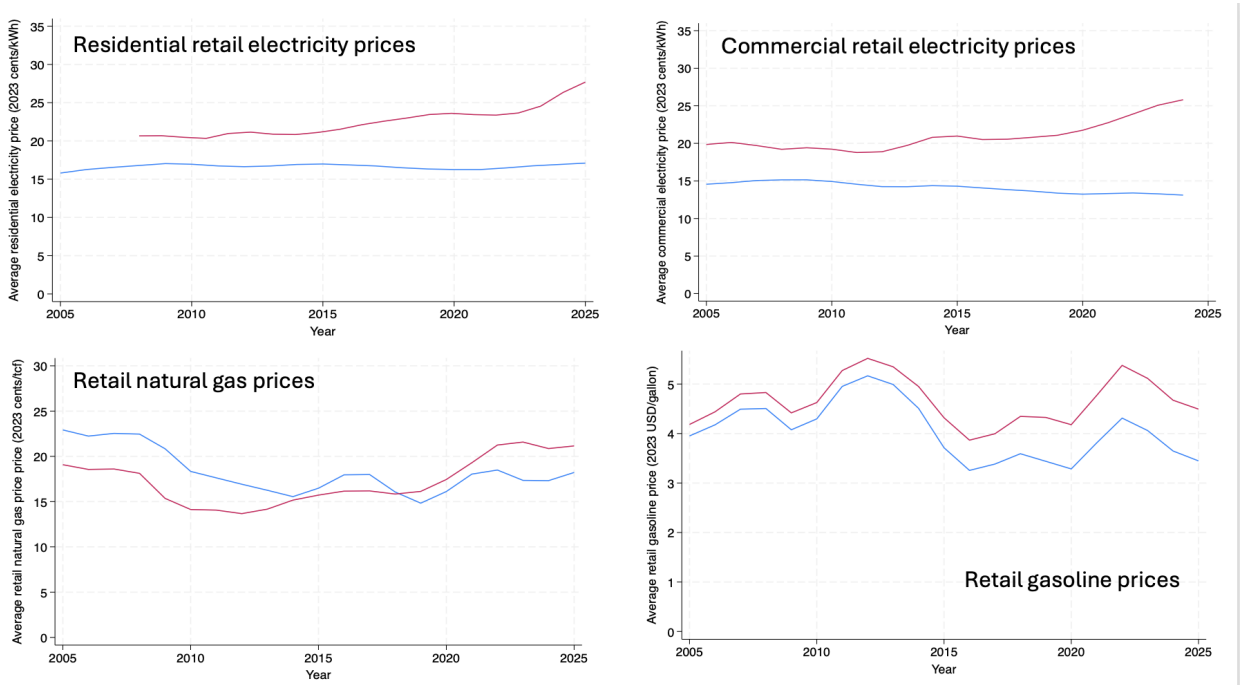
AB 398 and AB 1207 underscore the importance of reducing GHG emissions in a manner that minimizes cost-of-living impacts and avoids disproportionate burdens on low-income households. CARB is neither permitted to pursue emissions reductions at any cost nor allowed to subordinate climate ambition to short-run price concerns. Instead, it is tasked with navigating the space between these objectives. In principle, a well-designed carbon market can create economy-wide incentives for cost-effective GHG emissions reductions while simultaneously generating public revenues that can be used to offset unintended cost impacts on households and businesses. Carbon market reauthorization creates the potential to advance climate goals while mitigating impacts on energy affordability. To realize this potential, it will be important to ensure that consumer energy prices are brought more in line with both affordability objectives and long-run climate goals.

In the electricity and natural gas sectors, CARB has identified utility allowance allocation, mandatory auction consignment, and the return of auction proceeds to customers through the California Climate Credit (CCC) on utility bills as the primary mechanisms through which Cap-and-Invest revenues are used to mitigate energy affordability impacts. By contrast, there is no comparable, fuel-specific revenue recycling mechanism for gasoline consumers. Instead, some of the carbon pricing revenues collected from transportation fuel suppliers will benefit households indirectly through programs funded by the Greenhouse Gas Reduction Fund and other programs.

This chapter does three things. First, we put California’s retail energy prices into perspective, contrasting the retail prices that consumers have been paying against an efficiency benchmark estimate of social marginal costs. This comparison shows the extent to which retail prices reflect the estimated social marginal costs of fuel production/consumption. Second, we discuss recent policy changes that are designed to respond to energy affordability– and energy efficiency– concerns within the context of the Cap and Invest program. Finally, we focus on three CCC design decisions that are currently under consideration by implementing agencies. We offer some recommendations that aim to align carbon market revenue recycling design with the guiding objectives of affordability, energy efficiency, and salience.

California's retail energy prices are high

Before diving into a discussion of how carbon pricing impacts consumer costs in California, it is useful to put California's retail energy costs into perspective. Exhibit 1 summarizes the historical relationships between California retail energy prices (in red) and US average prices (in blue). All retail prices have been adjusted for inflation.



Notes: Average inflation-adjusted retail rates in California are shown in red; national average prices are in blue. National average residential prices (nominal) come from the EIA (Table 7c). PG&E residential prices come from the CPUC (here). CPUC data summarize average bundled retail rates paid by all California households (including CARE customers). Natural gas prices, commercial electricity prices, and retail gasoline prices all come from the EIA. FRED inflation adjustment factors use 2025 as the base year.

The top two figures track real (i.e. inflation-adjusted) residential and commercial retail electricity prices paid by California's customers in red. National average prices are shown in blue. California's retail electricity prices have been rising faster than inflation and most are increasingly out of line with the rest of the country. It is worth noting that some of the smaller suppliers in the state –those with smaller infrastructure footprints and lower wildfire risk mitigation obligations- charge lower prices.

California's retail natural gas prices have also increased above US average retail prices in recent years. One reason is that fixed infrastructure costs (e.g. pipeline infrastructure, safety programs) are being spread over a declining rate base as building electrification

reduces natural gas demand. This process is likely to continue as the state transitions away from fossil fuels.

Retail gasoline prices have fallen -in real terms- in recent years. That said, California gasoline prices are higher than the national average (although lower than the global average) and the gap appears to be widening.

Taken together, these retail energy price trends are raising concerns about energy affordability in California. An increasing carbon price will put further upward pressures on these fossil fuel prices.

California retail energy prices are high. Electricity prices are *too* high.

The production and consumption of fossil fuels generate harmful emissions - local pollution and GHGs - that fossil fuel suppliers do not internalize absent pollution regulations and policies. To coordinate socially efficient energy consumption choices, retail energy prices should ideally reflect the social marginal cost which includes environmental impacts and associated health costs. Exhibit 1 shows that retail energy prices in California are higher than the national average. But this need not imply that these prices are *too* high if, in consumer prices are set lower than the full social cost.

The table below compares the average retail prices that Californians paid for energy in 2023 against estimates of the 2023 private marginal cost (i.e. what it costs suppliers to incrementally increase fuel production and distribution) and estimates of the 2023 social marginal cost.

Table 1: 2023 Retail Energy Prices, Social Marginal Cost Estimates, and Cap-and-Trade Compliance Costs

	Electricity PG&E	Electricity LADWP	Natural Gas PG&E	Natural Gas So Cal Gas	Gasoline (state average)
Private marginal cost (2023 USD)	$0.07/kWh	$0.07/kWh	$0.59/therm	$0.59/therm	$3.60/gallon
Social marginal cost (SCC=$50)	$0.08/kWh	$0.08/kWh	$1.01/therm	$0.99/therm	$4.71/gallon
Social marginal cost (SCC=$200)	$0.15/kWh	$0.15/kWh	$1.76/therm	$2.05/therm	$6.27/gallon
Nominal retail energy price (USD 2023)	**$0.34/kWh**	**$0.23/kWh**	**$1.86/therm**	**$1.27/therm**	**$5.08/gallon**
2023 compliance cost impacts (2023; $/kWh)	$0.01/kWh (<3%)	$0.02/kWh (9%)	0.18/therm (10%)	0.17/therm (21%)	$0.26/gallon (5%)

Notes: Marginal cost data, compliance costs, and social marginal cost estimates come from Borenstein, Fowlie, and Sallee (2025). Residential and commercial electricity prices come from PG&E and LADWP rate sheets, respectively. PG&E reports average bundled rates for electricity customers. LADWP reports average revenue per kWh sold (versus volumetric rates). Natural gas units (converted to kWh) come from Borenstein, Fowlie, and Sallee (2025).

Private marginal costs (PMC) measure the procurement costs incurred by energy suppliers (e.g. utilities, gasoline distributors) in 2023. These include fuel costs, taxes, and any costs of complying with climate regulations.

The social marginal cost (SMC) estimates include private fuel and operating costs, local air pollution damages, and climate change related impacts. We report two SMC estimates - one that reflects a social cost of carbon (SCC) of $50/ton and another that reflects an SCC of $200/ton. Taxes are not reflected in the SMC because taxes are transfer payments from one entity (fuel suppliers) to another (government).

Carbon market compliance costs are based on 2023 GHG allowance prices and GHG intensities. We express these 2023 compliance costs as a share of 2023 retail prices. All else equal, the retail price impacts of carbon pricing will increase with the GHG allowance price.

Retail electricity rates are too high

Retail electricity rates significantly exceed private marginal costs because substantial non-incremental costs (e.g. investments in wildfire risk mitigation, transmission system infrastructure, etc.) are recovered in per-kWh rates.

In Table 1, PG&E retail rates are more than double the social marginal costs. LADWP retail rates are somewhat lower because LADWP is a municipal utility that does not incur the same capital investment costs, wildfire risk mitigation costs, etc. Nonetheless, LADWP retail rates still exceed the efficient benchmark price by a significant margin. And this margin has been widening as retail electricity prices increase to recover increasing capital expenditures while the grid gets cleaner (and SMC falls).

Retail natural gas prices are high in some parts of California - but not everywhere

Table 1 compares retail natural gas prices with SMC estimates for two natural gas utilities. In the case of PG&E, retail prices exceed the higher social marginal cost estimate. The reason for the gap between private marginal costs and retail prices is similar – utilities recover non-incremental costs in retail rates. As more homes and businesses electrify, this gap will widen as these fixed costs are allocated over a smaller base of retail sales. In Southern California, retail prices were consistent with a social cost of carbon of approximately $175/ton.

Inefficient energy pricing discourages fuel efficiency

The gap between the retail prices consumers pay and the socially efficient price benchmark is wider for electricity than other fossil fuels. This distorts consumer investment choices and hampers climate policy efforts that aim to electrify applications that are currently served by fossil fuels.

Consider, for example, the costs of home heating. Borenstein et al (2025) estimate that the average costs of operating a residential natural gas furnace in California – including the estimated pollution and climate costs- significantly exceed the average cost of heating with an electric heat pump. In other words, for most homes, electric heat is a more efficient choice. However, from a household perspective, the heat pump costs more to operate because retail electricity prices make electricity look artificially expensive.

Retail gasoline prices are below the efficient benchmark price

Retail gasoline prices in California are higher than the national average, but lower than estimates of social marginal cost and below the global average price in 2023. This suggests that increasing gasoline prices via higher cap-and-invest compliance costs could be justified on economic efficiency grounds. Calculations summarized in Table 1 shows that, in 2023, carbon pricing increased the average retail gasoline price by approximately 5%.

GHG cap-and-invest compliance costs rise as a function of the carbon price. Compliance costs are a function of the carbon price and the emissions intensity of the fuel in question. Carbon price projections vary across modeling exercises, but all studies project that carbon prices will increase as the program becomes more stringent.

Electricity sector emissions are relatively low and falling due to the deployment of renewable energy, which helps mitigate the cost impacts for electricity ratepayers over time. In contrast, natural gas and fossil transportation fuels have effectively fixed emissions, which means that consumer price impacts go up as carbon prices rise without any mitigating technological effects. If the carbon price increased from $30/ton to $50/ton, for example, this would increase retail gasoline prices by an extra 16 cents/gallon.

Increasing impacts on retail natural gas and gasoline prices will likely coincide with other developments. Refinery closures and retail gas station exits will put upward pressure on California gas prices. Electrification in the building sector will mean that fixed cost recovery in the natural gas sector is concentrated on a smaller base. It will be important to monitor and respond to concerns about rising natural gas, gasoline, and diesel prices, particularly for households with limited access to low-carbon alternatives.

Designing Cap-and-Invest with energy affordability in mind

California's retail electricity prices – and some natural gas prices – are too high in the sense that they exceed the estimated marginal social cost (i.e. fuel costs, climate costs, pollution costs). There are two reasons to be concerned about implementing policies that push retail prices even higher. First, higher energy costs can have negative financial impacts on households, and low-income households in particular. Second, raising retail electricity (and some natural gas) prices exacerbates pre-existing distortions caused by recovering non-incremental costs in retail rates.

Historically, the effects of cap-and–trade compliance on electric and natural gas utility bills (electricity and natural gas) have been offset using the California Climate Credit (CCC). Through 2023, electricity distribution utility (EDU) ratepayers have received nearly $11 billion in biannual Climate Credits on electricity bills (CARB 2025f). The number of allowances allocated to each EDU is based on its anticipated compliance cost burden, which is calculated using each utility's demand and supply forecasts.

Recent legislation and the associated ISOR introduce or propose some important changes to California's consumer climate credit program:

- **HOW:** Historically, utilities have been prohibited from using allowance value to reduce volumetric rates. This prohibition was originally intended "to preserve the carbon price signal that is included in electricity and natural gas rates" (CARB 2016). However, now that retail electricity rates are above the social marginal cost, using allowance value to bring electricity rates closer to actual costs would deliver

efficiency and distributional benefits. Recognizing this, the ISOR proposes to remove the prohibition on non-volumetric returns for IOU EDUs. This change would enable the CPUC to evaluate and consider alternatives that improve efficiency and support customer affordability.

- **WHAT:** CARB is required to design the regulations in a manner that transitions support from gas corporations where appropriate to EDUs to minimize ratepayer impacts on or before January 1, 2031. The stated rationale is to support electrification and reduce electricity costs.
- **WHEN:** SB 254 and AB 1207 direct the CPUC to change the timing of the climate credits to target the highest-cost summer months.

We evaluate these three climate credit design choices with three policy objectives in mind:

1. **Energy affordability**: climate credits can be used to offset policy-induced increases in energy costs.
2. **Energy efficiency:** If the climate credit is used to bring electricity rates more in line with efficient price benchmarks, households can make more energy efficient consumption and investment decisions. Reducing retail electricity rates will bring grid electricity costs as perceived by consumers more in line with true social costs; this will support more efficient transportation and heating fuel choices.
3. **Public awareness** : Some rebate structures may be more salient for households than others. Policymakers want to make sure that Californians can see and appreciate how GHG allowance revenues are being used to reduce impacts on Californians.

How to structure the CCC rebates?

The current CCC structure rebates compliance costs in bi-annual on-bill payments to customers. Alternatively, the CCC could be used to reduce volumetric retail electricity rates. Economists favor this approach because it would bring consumer prices more in line with the social marginal cost of electricity consumption. Utilities may favor the status quo due to ease of implementation.

Affordability: One way or the other, rebating CCC funds to utility customers will reduce utility bills. A lump sum credit improves affordability in the sense that household utility bills are lower. Switching to a volumetric climate credit would allocate more of the climate credit revenues to higher-usage consumers. In 2023, low-income CARE households consumed more grid electricity, on average, than non-CARE customers.

Energy efficiency: Using CCC funds to reduce volumetric rates would improve energy efficiency. This reduction, together with the income graduated fixed charge which is currently being phased in, would reduce rates by approximately 10%. A 10% reduction in

residential electricity rates would significantly reduce the annual cost of driving an EV or operating a heat pump.

Salience: The relative salience of volumetric rate reductions and lump sum credits depends on how people engage with their electricity bills. Although there is empirical research that finds households respond to average - versus marginal- electricity prices in the short run, we are not aware of any work that explores whether reductions due to lump sum transfers- versus volumetric discounts- are more or less noticed by consumers.

How to reallocate the natural gas allocation value?

Under AB 1207, CARB is directed to design the cap-and-invest regulations in a manner that transitions support from gas corporations to electrical distribution utilities. Legislative analysis cites energy efficiency as a motivation for this change:

"Particularly as state policies continue to push Californians towards electrifying more and more of their home appliances, defraying more of their electric bills with the Climate Credit (and no longer subsidizing their gas bills) could make sense."

Affordability: Sending GHG allowance revenues back to households as bill credits put money in the pockets of utility customers. Moving a lump sum credit off of gas bills and onto electricity bills will not change the total reduction in utility bills (summed across households and firms), but it could change how these funds are distributed *across* households depending on how the allowance value is allocated across electric utilities. Because lower income households can be slower to electrify due to credit constraints and other frictions, a transfer of allowance value from natural gas bills into a volumetric electricity bill credit has the potential to be somewhat regressive (depending on how this transfer is designed and orchestrated).

Energy efficiency: Legislative analysis cites energy efficiency arguments – and residential electrification in particular –as a rationale for transferring allowance value away from natural gas utilities. It is not at all clear why a transfer of a *lump sum* climate credit from natural gas bills to electricity bills would support electrification. Larger lump sum credits on electricity bills may be more salient in the summer months when they are delivered. But these lump sum credits do not change the operating costs of electric versus natural gas compliances. A shift of allowance allocation away from natural gas utilities and towards electric utilities will not promote electrification unless the climate credit value is restructured to reduce volumetric electricity rates.

When to allocate consumer climate credits?

Concentrating rebates in summer months can deliver salient bill relief during times where bills are highest in areas of the state where temperatures – and cooling costs– are rising. However, this does little to improve incentives for cost effective fuel switching if credits are delivered as a lump sum transfer.

It is also important to think about how this requirement to concentrate rebates in the summer months could interact with the reallocation of the natural gas allocation value. If

electricity and natural gas allowance value are credited in four summer months, this could reduce some electricity rates below social marginal cost while leaving prices during the other eight months of the year highly distorted. Using natural gas allocation value to reduce electricity rates across all 12 months of the year would mitigate this issue.

Natural gas and gasoline price impacts

AB 1207 made an explicit choice to transition allowance allocations from natural gas utilities to electric utilities. Transportation fuels have never had any climate credit or other compensatory mechanism, and will continue to be fully exposed to the program's compliance costs which will increase with carbon prices. Experiences in other jurisdictions – such as France and Canada– suggests that a failure to acknowledge and address these consumer price impacts can undermine voter support for carbon pricing.

Balancing climate ambition, economic efficiency, and affordability concerns is more challenging in the context of natural gas, gasoline, and diesel prices. From an economic efficiency standpoint, these prices should rise to reflect the full social cost. In theory, state policymakers could decide to target rebates or tax cuts to Californians impacted by rising fossil fuel prices using the revenues collected from quarterly auctions of state-owned allowances. In practice, however, revenues may be scarce given the commitments made in legislation (see Revenue Chapter).

Draft Recommendations

Based on the information and analysis summarized above, we offer the following observations:

Recommendations:

1. **Restructuring the climate credit to reduce California's too-high volumetric retail electricity prices delivers fuel efficiency and affordability benefits.** Lump sum credits do make bills more affordable and could be implemented in a way that helps households see the benefits flowing back to Californians. But lump sum credits are a missed opportunity to gain efficiency by bringing retail rates more in line with social marginal cost. CARB has proposed to allow volumetric rebates and the CPUC has expressed a willingness to consider this form of rebating. This is an encouraging development. Using carbon market revenues to reduce volumetric electricity prices would deliver both efficiency and distributional improvements.

2. **Concentrating climate credits in the summer does little to promote heat pump adoption/ building electrification.** If the reallocation of GHG allowance value off of natural gas bills and onto electricity bills is intended to promote building electrification, these funds should be used to reduce volumetric electricity rates in *all* months (not just summer months). This is particularly important for space and

water heating (the use of which peaks in winter months). Legislation clearly states that the electricity climate credit should be refunded to customers in summer months - trading off some energy efficiency gains for consumer awareness objectives. If there is leeway to distribute the allocation that is moving from natural gas bills to electricity bills in other months, this should be pursued.

3. Higher carbon prices will put upward pressure on natural gas and gasoline prices. These increases will coincide with other factors that are pushing gasoline and natural gas prices up (e.g. refinery closures and declining natural gas demand). Given mounting concerns and frustrations around rising costs of living in California, it will be important to acknowledge that rising carbon prices do translate into rising natural gas and gasoline prices. Clear communication around the magnitude of these price impacts, and the programs and resources being allocated to offset these impacts, could help build public understanding and acceptance around important climate policies.

Cost Containment

Joe Nation (lead) and Katelyn Roedner Sutter

This chapter focuses broadly on cost containment[1] as California maintains its commitment to reducing greenhouse gas emissions over the next two decades. Much of the focus is on the role of cap and trade[2] (now called cap and invest) as the most cost-effective approach to incentivizing emissions reductions.[3] This chapter also focuses on how cost containment measures can improve price predictability and stability over time, which improve confidence in the carbon market and can reduce system costs. This discussion of design options and their trade-offs can inform CARB's current regulatory process to implement legislative direction and guide stakeholders in evaluating the current proposal.

This chapter focuses on four broadly-defined cost containment concepts/mechanisms:

- Price stability tools
- Offset integrity and opportunities
- Linkages.

Price Stability Tools

Price stability tools can aid in containing system costs and include modifications to price floors and ceilings, reductions to the cap decline factor, changes in allowances,[4] and expanded banking.

[1] Cost containment reflects a focus on total compliance costs over time. This is in contrast to carbon market *price* containment, which typically reflects a narrow focus on the current or near-term market price of emissions.

[2] Cap and invest operates on a near economy-wide basis as the most cost-effective tool for as a backstop for other climate programs measures that may underperform.

[3] California's cap-and-trade program is designed to be cost effective and delivers greenhouse gas reductions more affordably than other climate and energy policies. See Clean and Prosperous California (2025) Fact Sheet on California's Cap-and-Invest Program for a summary of the academic literature.

[4] Including additional free allowances, a modified Allowance Price Containment Reserve (APCR), Emissions Containment Reserve (ECR), and a Market Stability Reserve (MSR).

Allowances

Increase Free Allowances

One approach to cost containment involves increasing free allowances to industry.[5] In the short term, this reduces the number of allowances that regulated entities must purchase, reducing short-term outlays. But increased free allowances do not reduce long-term system costs absent a change in long-term emissions reduction targets.[6] California allocates allowances for free on the basis of industrial output to industrial entities that are deemed to be at leakage risk. This output-based approach to free allocation can alter the allocation of abatement activities across regulated entities, and increase system-wide abatement costs by diluting the incentive to reduce GHG emissions among entities receiving output-based allocations. In short, while additional output-based allowances almost certainly lower short-term compliance costs, they need not contain costs over the long term.[7] While revenue-generation is not the primary purpose of the cap-and-invest program, increasing free allocation of allowances to industry would necessarily decrease the allowances available at auction, potentially significantly impacting the available revenue for climate, equity and other investment priorities.

Reductions to Cap Decline Factor

Reductions to the state's cap decline factor, that is, slowing the rate at which the cap declines, provides similar results to that of increasing free allowances, i.e., lower short-term compliance costs for some entities.[8] Similar to increasing free allowances, a decline in the cap decline factor can increase costs over time if emission-intensive entities and others delay investments in abatement technologies. This is particularly likely if firms focus more on near-term emissions targets, i.e., firms might delay near-term investment, which could lead to higher long-term compliance costs.

Modify Allowance Price Containment Reserve (APCR)

California's APCR releases allowances when quarterly auctions reach specified levels. Currently, the APCR contains two tiers, $60.47 and $77.70. It is intended to prevent or mitigate large price increases and provide market stability and confidence. To date, the APCR has not been triggered, although that is more likely in the future as California tightens its cap. The addition of a third tier in this scenario would provide additional

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[5] California explicitly acknowledges that targeted free allocations should be used to minimize industrial leakage, not to provide limited, short-term price relief. See https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/allowance-allocation?utm_source=chatgpt.com.

[6] Free allowances can reduce costs for specific regulated entities, but it does not affect marginal costs.

[7] https://www.nber.org/system/files/working_papers/w19338/w19338.pdf?utm_source=chatgpt.com

[8] If there is high confidence that emissions through 2045 will remain unchanged and regulated entities operate with perfect foresight, reductions to the cap decline factor will not affect short-term prices.

market stability and in doing so, could reduce long-term costs as the market responds incrementally (and thoughtfully) to price increases.

Implement Emissions Containment Reserve (ECR)

In contrast to the APCR, an Emissions Containment Reserve reduces allowance supply and tightens the state's emissions cap when prices are low, raising near-term prices.[9] The Regional Greenhouse Gas Initiative (RGGI) initially implemented and Washington state initially included an ECR. However, both have dropped this mechanism. Given the possibility of linkage with Washington, a California ECR is not likely despite the benefits previously discussed by IEMAC in prior reports.

Market Stability Reserve (MSR)

An MSR retires allowances from future auctions if the market becomes oversupplied or there is excessive banking. Active in the EU Emissions Trading System (ETS), an MSR would help in California if policy uncertainty is high.

Offsets

California's carbon market has permitted the use of offsets since inception, with maximum offset use of 4-8% of compliance obligations depending on the compliance period. The current offset usage limit is 6% of a compliance obligation, set by statute through 2045. Currently, CARB accepts projects based on six protocols. SB 840 directs CARB to update the existing offset protocols by January 1, 2029, and evaluate every 5 years thereafter.

Offsets can be an important cost containment tool. Studies and industry position papers have found cost savings of a few percent to as high as 15%, mostly flowing to entities that use offsets.[10] However, following the passage of AB 1207 and its direction to put offsets "under the cap,"[11] the role of offsets as a form of cost containment has changed. Whereas offsets previously expanded the market-wide supply of compliance instruments and reduced allowances prices, they now no longer do so. As a result, while offset usage can still lower costs for an individual compliance entity, their use reduces the supply of allowances and therefore raises the market price for allowances for all regulated emitters.

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[9] There are similarities with the price floor, which precludes sales below a specified minimum. However, an ECR does not necessarily result in higher prices. Instead, it reduces total allowances, strengthening environmental ambition.

[10] See https://www.rff.org/publications/issue-briefs/california-cap-and-trade-emissions-budget-climate-policy/?utm_source=chatgpt.com. Also see https://climatetrust.org/app/uploads/2025/05/Summary-analysis-on-Offsets-for-VERA-20250318-2.pdf.

[11] Health and Safety Code § 38562(c)(2)(E).

Offset use is somewhat concentrated among a small number of regulated entities with high emissions (oil refiners, utilities, etc.), which often use offsets to the maximum permitted. On the other hand, regulated entities with relatively low emissions use offsets less frequently and often do not use them to the maximum levels permitted, suggesting a less efficient process. One policy response is the creation of an offset "buyer's club" for compliance entities with low emissions to promote market efficiency. This could occur as technical assistance or as a CARB-approved list of offset projects for small emitters, particularly natural and working lands.

Offsets and specific offset protocols continue to generate controversy. These concerns focus on additionality, permanence, and project baselines.[12]

Linkages

Although opportunities are limited, California should explore additional linkages with other carbon markets that offer the potential to increase market efficiency.[13] Linkages are particularly useful in thin markets. California is currently linked with Quebec through the Western Climate Initiative.

California, Quebec, and Washington state have expressed interest in a broader carbon market through linkages. While a linkage with Washington may raise short-term allowance prices in California. (Oregon, which is considering introducing a carbon market, could be another likely partner.) [14]

California should link to a broader market only if partners have similar emissions targets, strong standards, similar co-benefit objectives, and governance provisions that provide for smooth exits while protecting the broader market.

[12] See https://onlinelibrary.wiley.com/doi/10.1111/gcb.16008 and https://www.nature.com/articles/s43247-023-00984-2 and the 2024 IEMAC report.

[13] Studies indicate 10-40% cost savings through linkages. E.g., https://www.oecd.org/content/dam/oecd/en/publications/reports/2021/04/the-economic-and-environmental-benefits-from-international-co-ordination-on-carbon-pricing_4064ea97/d4d3e59e-en.pdf?utm_source=chatgpt.com.

[14] Additional opportunities for linkage with U.S. states are likely limited in the near term as many seem to prefer low carbon fuel standards, rather than cap and invest.

Industrial Competitiveness and Leakage Risk

Brian Holt and Meredith Fowlie

California's cap-and-invest program is one of several climate policies designed to meet the State's climate change and air quality goals. Other policies include fuel standards, renewable and clean electricity standards, building standards, air quality programs, and land-use regulations. Taken together, these regulations will deliver emissions reductions and environmental benefits. They also impose compliance costs and obligations that California's industrial entities must navigate.

California climate policies cover only a subset of the industrial sources contributing to climate change. This creates the potential for leakage and related unintended impacts. For the purposes of this report, we distinguish between two forms of leakage.

Emissions leakage refers to changes in greenhouse gas (GHG) emissions from sources not covered by a policy that occur indirectly in response to that policy. This risk arises under any state climate policy that increases regulated entities' operating costs, not only carbon pricing programs.

Economic leakage refers to the relocation of production, investment, jobs, or profits from California firms to unregulated producers as a result of GHG regulations that apply only to in-state emissions and emitters.

Minimizing emissions leakage is a statutory requirement under AB 32 and a central design objective of the cap-and-invest program. Maintaining industrial competitiveness is also a stated policy priority. The reauthorization of the cap-and-invest program provides an important opportunity to re-evaluate how California's leakage mitigation strategy is working.

AB 1207 directs CARB to revisit (and revise if needed) the industrial allocation methodologies that have been designed to minimize emissions leakage and manage adverse impacts on consumers, businesses, and the state economy. The Initial Statement of Reasons (ISOR) proposes continued reliance on output-based allocation for emissions-intensive, trade-exposed (EITE) sectors and raises some consequential design questions, including benchmark stringency, cap adjustment factors, and the treatment of emerging technologies.

In what follows, we first review the economic arguments for using output-based GHG allowance allocation to mitigate leakage risk. We highlight some important policy design trade-offs that this leakage mitigation strategy presents. We then discuss how California has been implementing output-based allocations in the past, and we review some changes proposed in the ISOR. We conclude with some observations and recommendations.

Mitigating leakage with output-based allowance allocations

California has historically relied on output-based allowance allocations to manage and mitigate emissions leakage risk in emissions-intensive, trade-exposed (EITE) industries. Eligible EITE firms receive freely allocated GHG allowances based on past industrial output levels. This free allocation amounts to a production subsidy which creates an economic incentive to keep industrial production activities in California.

A carbon price coupled with a well-calibrated subsidy can – in theory- strike an efficient balance between incentivizing emissions reductions inside California while also reducing emissions leakage outside the state. It is important to note, however, that this leakage mitigation strategy comes at some cost:

- **Opportunity costs:** Allowances allocated for free to industrial entities could alternatively be sold at auction to raise GGRF revenues, used to offset utility bill impacts, or put to some other alternative use.
- **Abatement costs:** Output-based incentives dilute the carbon price signal that is transmitted to industries that receive these free allocations. This shifts more of the GHG emissions abatement obligation onto producers who are ineligible for these subsidies. Output-based allowance allocations will, therefore, increase the abatement costs incurred in-state, putting upward pressure on GHG allowance prices.

Given these costs, it is important to calibrate output-based subsidies in a way that balances costs with leakage mitigation benefits. In other words, the number of allowances allocated per unit of industrial output should be commensurate with the costs avoided when a unit of production remains inside California, versus “leaking” out of state.

Fowlie and Reguant (2022) derive an intuitive – albeit theoretical– expression for output-based leakage mitigating subsidies under a regime that is targeted towards emissions leakage. This formulation defines a sector-specific, output-based GHG allowance allocation in terms of three parameters:

(Eq. 1)	GHG Allowances/ Unit of output	=	Import GHG intensity	×	Import supply elasticity	×	Imports / in-state production

Intuitively, if imports are highly carbon intensive, leakage risk will be higher (all else equal), and the optimal output-based subsidy should increase to mitigate this risk. Similarly, if import suppliers are more responsive to changes in California production, and/or the sector is more trade exposed, larger leakage-mitigating subsidies are required to offset the associated leakage risk.

In theory, this theoretical formulation could be calibrated to reflect the leakage risk in different sectors; allowances could be allocated accordingly. In practice, translating this equation into real-world sector-specific allowance allocations is messy and complicated. It is extremely challenging to anticipate how compliance costs will interact with other cost pressures, and how firms will react to these changing market conditions. Data limitations further complicate the exercise (see Fowlie and Reguant, 2022). These difficulties do not invalidate output-based allocation as a viable leakage mitigation strategy. But they do underscore the complexity of the real-world practice.

Leakage mitigation in practice (in California)

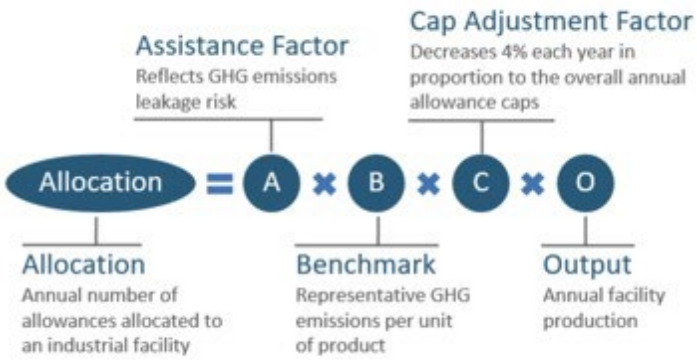
In California, eligibility for output-based allowance allocations is currently determined on the basis of two metrics:

1. **GHG Emissions intensity**: The GHG emissions intensity has generally been calculated as the metric tons of CO_2e per million dollars of value added.
2. **Trade Exposure**: This is measured approximately using the sum of imports and exports divided by the sum of total shipments and imports.

In the early years of the program, these two metrics were used to classify EITE industrial sectors in terms of high, medium, and low leakage risk.

Output-based subsidies– i.e. the number of allowances allocated per unit of output– are calibrated using the following formula:

Figure 1: California Output-Based Allowance Allocation Formula



Assistance factors (A) were initially set at 100% for all industries but designed to decline over time for sectors with lower risk. With the passage of Assembly Bill (AB) 398, CARB was instructed to set the assistance factor at 100% for all EITE sectors through 2030. AB 1207 provides guidance to set overall industrial allocation "in a manner that minimizes emissions leakage" beginning in 2031, without any specific requirement for the assistance factor.

Cap adjustment factors (C) decline at the same annual rate as the overall program allowance budget. Although the number of permits allocated per unit of industrial output is declining over time, the value of this allocation may rise or fall depending on the allowance price. In 2013, an alternate CAF was introduced which declines more slowly for a subset of sectors identified as having high leakage risk.

There are important similarities between Equation (1) and the current policy practice summarized by Figure 1. In theory and in practice, output-based production subsidies increase with sectoral emissions intensity. Likewise, output-based allocations are more generous for industries with greater trade exposure, as reflected in lower cap adjustment factors for sectors assessed to have higher leakage risk.

There are also some important differences. Sector-specific allocation levels—i.e. the number of allowances allocated per unit of output—are not calibrated to reflect measures of leakage risk. As a result, allocations may be too high in some sectors and too low in others. *Over*-allocation increases opportunity and abatement costs relative to what is necessary to mitigate leakage risk, while *under*-allocation increases the likelihood of emissions and economic leakage.

Post-2031 Leakage Mitigation in EITE Sectors

California's reliance on output-based free allocation reflects a pragmatic approach to balancing commitments to reduce GHG emissions in California with the need to mitigate emissions and economic leakage. The 2026 Staff Report (ISOR) proposes to stay this strategic course. Output-based allocations of GHG allowances will continue to be the primary mechanism by which leakage risk in EITE sectors is mitigated and managed. Given this choice of leakage mitigation strategy, the level of these output-based subsidies warrants review and scrutiny given the costs associated with under- and over-allocation.

The 2026 Staff Report proposes to maintain assistance factors at 100% through 2035 for all sectors currently. To support this proposal, CARB cites a contractor report on industrial leakage that has not been publicly released. CARB also notes that California's ratio of free allowance allocation to industrial emissions (62% in 2023) was significantly lower than in other jurisdictions like Washington (~100%), Québec (99%), and the EU (84%). The IEMAC observes, however, that industrial allocation in the EU ETS is planned to decrease, such that current ratios are not indicative of future outcomes pursuant to current policy.

Jurisdiction	2023 Industrial Covered Emissions	2023 Free Industrial Allowance Allocation	Ratio of Industrial Allocation to Industrial Covered Emissions (%)
California	54,876,876	32,921,049	60%
Washington	9,182,283	9,162,037	~100%
Québec	19,734,923	19,543,087	99%
European Union	628,571,429	528,000,000	84%
United Kingdom	50,900,178	36,856,294	72%

[1]

Figure 1: California Air Resources Board, Cap-and-Invest Program workshop presentation, October 29, 2025

In assessing the justification for 100% assistance factors, it will be important to compare not only 2023 levels of industry assistance, but also assistance factors post-2030. Moreover, the level of leakage risk faced by industrial producers in different jurisdictions can vary significantly due to differences in energy costs, regulatory mandates, infrastructure constraints, and other factors (National Academies, 2021; Bushnell & Zaragoza-Watkins, 2020). In other words, comparing levels of assistance afforded by other programs can be a misleading comparison if sectoral leakage risk varies across jurisdictions.

Under the ISOR proposal, the Cap Adjustment Factor (CAF) continues to decline annually, which means the total number of free allowances provided to industry will decrease over time in alignment with the state's overall emissions targets. The ISOR proposes to continue with the current process whereby a majority of industrial facilities fall under the standard cap adjustment factor, while a limited group of EITE industrial sectors – i.e. those deemed to be at high leakage risk- are subject to a slower cap adjustment.

The Proposed ISOR Amendments also introduce new Cap Adjustment Factor Modifiers (CAFM) for the Manufacturing Decarbonization Incentive Allocation. These modifiers are added to the standard or alternate CAF to provide additional incentive to invest in on-site decarbonization technologies. This is a creative use of free allowance allocations that has the potential to accelerate needed investments in industrial decarbonization. That said, several decarbonization pathways rely on infrastructure that is still under development, such as expanded transmission, hydrogen supply, or carbon storage. The timeframes envisioned for these MDI allocations may not align well with the facility permitting and construction timelines of industrial projects they are designed to support.

Border carbon adjustments

Border carbon adjustments (BCA) provide an alternative strategy to address emissions leakage that could reduce or eliminate the need for output-based allocations. Leakage mitigation is achieved by taxing GHG emissions embodied in imports (versus allocating allowances to regulated entities on the basis of output). This would free up the use of allowances that would otherwise be allocated to industry for other purposes, such as funding the Greenhouse Gas Reduction Fund or providing additional utility customer benefits. The academic literature identifies BCAs as potentially effective for commodities with well-defined emissions intensities, such as cement or steel (Bataille, 2020). Border carbon adjustments offer a pathway to align carbon costs for in-state producers and imported goods. In contrast to output-based allowance allocation, a border carbon adjustment raises revenues, thus avoiding costs summarized above. Legal questions remain a concern about the extent of state authority to impose border measures, especially where foreign commerce is implicated (Gamage et al., 2023). Federal authority in this area is clearer than state authority.

The recently launched CBAM in Europe will provide an important test case that California can learn from. Many questions remain around how such an approach could be implemented effectively in California. Under Assembly Bill 398, CARB was required

to assess the potential for a border carbon adjustment by the end of 2025, but has not yet delivered the required report.

Conclusions and recommendations

California's industrial producers face many challenges, including an evolving carbon market environment, growing cost pressures from rising energy prices, aging infrastructure, regulatory mandates, permitting timelines, and labor standards. These overlapping pressures will shape how facilities respond to climate policy compliance obligations. If the cap-and-invest program is designed to provide predictable incentives and reasonable cost incidence, industrial facilities can invest in the transition while maintaining production and employment in California.

Leakage mitigation in real-world carbon markets is inherently imprecise. While theory provides useful guidance on how output-based allocations should be targeted, practical calibration depends on uncertain parameters, incomplete data, evolving technologies, and firm responses that are difficult to predict ex ante. Allocation factors should therefore be understood as informed approximations rather than finely tuned instruments. This reality argues for transparency, periodic reassessment, and adaptive updating of allocation parameters, rather than expectations of precision targeting. A well-designed system should aim to be directionally correct, evidence-based, and adjustable over time as better data and experience accumulate.

Given program objectives established by AB 32, AB 398, and AB 1207, we offer the following two recommendations.

1. CARB should review the industrial leakage risk classifications, and the parameters that define output-based allowances in light of updated and available evidence on the level of leakage risk faced by different sectors. In the interest of transparency, information and analysis used to inform this review should be publicly shared to the extent possible.
2. California should continue to explore border carbon adjustments for specific commodities. Legal analysis indicates that narrow, performance-based measures may be more viable than broad BCAs (Gamage et al., 2023), but further research is needed to understand practical implementation.

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Revenue

Danny Cullenward and Joe Nation

The cap-and-invest program raises several billion dollars per year for California's Greenhouse Gas Reduction Fund (GGRF), via the sale of state-owned allowances at four quarterly auctions each year. This chapter evaluates the policy choices that shape program revenues and reviews the new spending rules adopted in the recent reauthorization of the cap-and-invest program, including some of the elements of the recent regulatory proposal from CARB.[15]

Factors affecting program revenues

At a high level, program revenues are the product of the number of state-owned allowances sold at quarterly auctions and the auction settlement prices. The number of state-owned allowances is determined by the program's regulations, which specify the total number of allowances made available each year and determine the subset of state-owned allowances that are sold at auction to fund the GGRF.

Auction settlement prices are a function of the overall supply-demand balance in the market, along with market design features like the allowance price floor, the allowance price containment reserve, and the price ceiling (see Cost Containment Chapter). The total number of allowances in each year's allowance budget affects the overall supply-demand balance, with a larger allowance budget leading to lower carbon prices and a smaller allowance budget leading to higher carbon prices. For simplicity, this chapter focuses on the number of allowances made available rather than an analysis of potential market prices.

Total allowance budgets

CARB regulations determine the total number of allowances made available in each year, which is known as the total allowance budget (see Ambition Chapter). Total allowance budgets are set through 2050 in the current regulations, which took effect in 2018. These levels are less ambitious than the emission reductions required by the subsequent passage of California's carbon neutrality legislation, AB 1279 (Stat. 2022, Muratsuchi),[16] which requires at least an 85% reduction in statewide emissions below 1990 levels by 2045. Accordingly, AB 1207 (Stat. 2025, Irwin) requires CARB to "achieve the requirements" of the state's 2045 target.[17]

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[15] CARB, California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation, Staff Report: Initial Statement of Reasons (Jan. 20, 2026) (hereinafter "CARB ISOR").

[16] Health and Safety Code § 38562.2 (as added by AB 1279).

[17] Health and Safety Code § 38562(c) (as added by AB 1207).

Pursuant to the previous extension bill, AB 398 (Stat. 2017, E. Garcia), CARB is also required to "[e]valuate and address concerns related to overallocation in the state board's determination of the number of available allowances for years 2021 to 2030, inclusive, as appropriate."[18] As the IEMAC has discussed in previous reports, annual allowance budgets have exceeded emissions for nearly all of the program's history, leading to a growing "bank" of privately-held allowances that could enable covered entities to comply with program regulations while exceeding statewide targets set by statute.[19] Compliance data from the program's fourth compliance period (2021-2023) indicates that, as of the end of Q4 2024, the private bank had grown to 379 million allowances, or more than one year's annual allowance budget.[20] CARB's Initiate Statement of Reasons (ISOR) does not address this issue.

CARB is expected to revise annual allowance budgets as it implements AB 1207 and SB 840 (Stat. 2025, Limón). In a July 2024 workshop, CARB indicated a potential interest in reducing 2021 through 2030 allowance budgets by a total of 265 million allowances, which intervention the staff presentation concluded would align the program with the 2022 Scoping Plan's goal of reducing statewide emissions 48% below 1990 levels by 2030.[21] In an October 2025 workshop held after the passage of AB 1207 and SB 840, however, CARB indicated a potential interest in a smaller reduction of only 118 million allowances from the 2021 through 2030 allowance budgets.[22] According to CARB's July 2024 workshop presentation, a reduction of only 118 million allowances from allowance budgets through 2030 is not consistent with the intervention CARB identified as necessary to achieve a 48% reduction by 2030, and is approximately the same as the intervention CARB identified as necessary to achieve a 40% reduction by 2030.[23] (This is further discussed in chapter 1.)

In the January 2026 ISOR, CARB proposes to remove a total of 264 million allowances from the status quo allowance budgets.[24] However, this total includes only 118 million allowances removed from budget years 2027 through 2030, with the remaining 146 million allowances removed from post-2030 allowance budgets. Notably, the 146 million allowances removed from post-2030 allowance budgets include reductions associated with aligning the current allowance budgets with the AB 1279 target for 2045. Because these reductions are needed to support the 2045 target specifically, they do not appear to address concerns about the large bank of allowances that has developed since the

[18] Health and Safety Code § 38562(c)(2)(D) (as added by AB 398).
[19] IEMAC, 2021 Annual Report of the IEMAC (Feb. 4, 2022) at 12-18.
[20] IEMAC, 2024 Annual Report of the IEMAC (Feb. 25, 2025) at 44.
[21] CARB, Cap-and-Trade Program Workshop slides (July 10, 2024) at 16; CARB, Potential Allowance Budget Scenarios (July 10, 2024).
[22] CARB, Cap-and-Invest Program Workshop slides (October 29, 2025) at 18.
[23] CARB, Cap-and-Trade Program Workshop slides (July 10, 2024) at 16.
[24] CARB ISOR at 31-36.

program's inception, nor do they contribute to increased ambition to reduce emissions through 2030.

The IEMAC observes that the 2018 cap-and-invest rulemaking was designed to support the statutory target of reducing statewide emissions at least 40% below 1990 levels. Subsequently, CARB's 2022 Scoping Plan "identifies a need to accelerate the 2030 target to 48 percent below 1990 levels."[25] In the ISOR, CARB appears to indicate that its proposal to reduce 264 million total allowances is consistent with the 2022 Scoping Plan's target of a 48% reduction by 2030,[26] but the proposed intervention appears to only be consistent with the earlier claim that these interventions are associated with a 40% reduction in statewide emissions by 2030 (rather than a 48% reduction).[27]

Finally, the IEMAC observes that all of the claims CARB has presented about the number of allowances that need to be removed from the allowance budgets in current program regulations are asserted without a clear analytical basis. Without a better understanding of the relevant modeling work and/or assumptions, it is difficult to express an independent view of the technical merits of these claims. Nevertheless, taken at face value, CARB's statements suggest that the proposed allowance budgets may not be consistent with the 2022 Scoping Plan's goal of reducing statewide emissions 48% below 1990 levels.

Number of state-owned allowances

CARB's program regulations specify how the total allowance budget is allocated, with some allowances freely allocated to market participants and some sold at auction. As discussed in last year's report (IEMAC 2024, Allowance Allocation chapter), CARB's regulations:

- Specify the number of allowances freely allocated to electric and natural gas utilities for the purposes of benefitting utility ratepayers;
- Include formulas for how allowances are freely allocated to industrial emitters to address concerns related to emissions leakage;
- Specify a number of allowances that are set aside for the Allowance Price Containment Reserve, where they are available for purchase at specific price levels in excess of historical market prices;
- Reduce allowances to put offsets "under the cap" per legislative direction in AB 1207;[28] and

[25] CARB, 2022 Scoping Plan Update (December 2022) at 71.
[26] CARB ISOR at 32 (Table 3).
[27] CARB, Cap-and-Trade Program Workshop slides (July 10, 2024) at 16.
[28] Health and Safety Code § 38562(c)(2)(E)(iii).

- Determine the number of state-owned allowances sold by CARB at auction to raise revenue for the GGRF as a residual — essentially, what is left over after the other specified allocations.

Because several of these allocations depend on actual data and/or other outcomes not fully specified in the program regulations, the number of state-owned allowances available at auction is also not specified in advance.

GGRF spending

State law determines how funds raised for the GGRF are allocated. Historically, a little more than ⅔ of total GGRF revenues were continuously appropriated according to statutory formulas, with a little less than ⅓ available for the annual budget process. Senate Bill 840 (Stat. 2025, Limón) changed the GGRF into a four-tiered structure, effective as of the 2026-27 budget year.[29]

	Program or purpose	**Amount ($ per year)**
Tier 1 (~$200 million)	CAL FIRE state fire prevention fee	~$90 million[30]
	Manufacturing R&D tax credit	~$160 million[31]
	State operations	~$120 million[32]
	Legislative Counsel Climate Bureau	$3 million
Tier 2 ($2 billion)	High-speed rail	$1 billion
	Discretionary via annual budget[33]	$1 billion

[29] Health and Safety Code § 39719.4.

[30] LAO, The 2026-27 Budget Cap-and-Invest Expenditure Plan (February 10, 2026)) at Figure 1. The IEMAC notes that this expenditure is scheduled to sunset on January 1, 2031.

[31] *Id*. The IEMAC notes that this expenditure is scheduled to sunset on July 1, 2030.

[32] *Id*. The IEMAC notes, as observed in the LAO report referenced here, that this item is not referenced in SB 840 but is included in the Governor's proposed budget trailer bill language. It is listed here for completeness to indicate the potential range of funding commitments anticipated by policymakers.

[33] SB 840 also indicated an intention to make $250 million worth of one-time commitments in the 2026-27 budget to fund transit passes ($125 million), a University of California research center ($25 million), rebuilding Topanga park ($15 million), and to support climate-related innovation ($85 million). Health and Safety Code § 39719.4(b)(2)(B).

	Program or purpose	**Amount ($ per year)**
Tier 3 ($1.98 billion)	Strategic Growth Council, Affordable Housing and Sustainable Communities	$800 million
	Caltrans Transit and Intercity Rail Capital Program	$400 million
	CARB community air protection programs	$250 million
	Caltrans Low Carbon Transit Operations Program	$200 million
	CAL FIRE forestry, fire prevention, prescribed fire	$200 million
	Safe and Affordable Drinking Water Fund	$130 million
Tier 4	Discretionary via annual budget	Any remaining

Under this structure, Tier 1 funding needs are funded first (about $373 million), followed by Tier 2 ($2 billion) and then Tier 3 ($1.98 billion). Tier 1 funding needs are not fully specified in advance, due to the nature of the CAL FIRE and manufacturing tax credit funding needs. Assuming that these needs require $200-300 million per year, SB 840 envisions about $4.35 billion in GGRF spending per year (i.e., Tiers 1, 2 and 3). Any excess GGRF revenue would be available for use in the annual budget process (i.e., Tier 4).

In order to fully fund all programs listed under SB 840, GGRF revenues would have to increase above their historical levels. The GGRF raised sufficient revenue in FY2021-22 and FY2023-24, but did not raise a minimum of $4.35 billion in any other fiscal year to date.

In order to fully fund the Tier 1 and Tier 2 programs specified under SB 840, the GGRF would need to raise about $2.37 billion per year. This has occurred every year since FY2017-18, except for FY 2019-20 (which included a temporary dip in allowance revenues coincident with the COVID-19 pandemic).

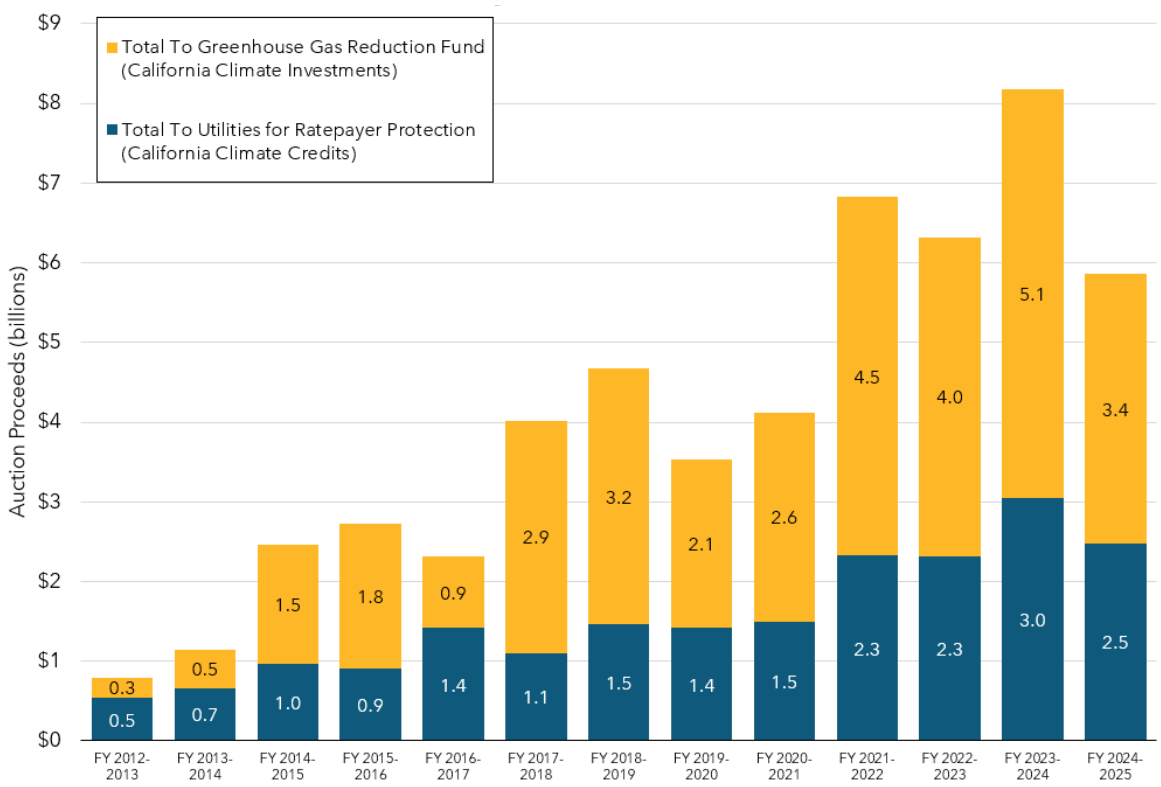

Figure from CARB dashboard.

ISOR projections

In the ISOR, CARB staff analyze the proposed regulations and conclude, at least for the purposes of reporting potential outcomes, that GGRF revenues will never meet the minimum spending requirements anticipated in SB 840.[34] The ISOR projects a scenario in which GGRF revenues will peak in 2027 at $4 billion — slightly less than the $4.35 billion in commitments anticipated in SB 840 — and then steadily decline every year, falling to $1.9 billion in 2035.

If CARB's projections are representative of future outcomes, this would imply that the SB 840 funding commitments will never be fully funded. By 2035, none of the Tier 3 spending priorities would receive any funding, although policymakers could allocate the $1 billion in Tier 2 annual discretionary funding to backfill some of the missing

[34] CARB ISOR at 299 (Table 15).

revenue.[35] However, under CARB's projected scenario, the annual discretionary funding would fall below $1 billion per year by 2035.

The IEMAC notes that these projections are contingent on many assumptions, most of which are not explicitly documented in the ISOR. For the purpose of reporting GGRF revenues, the ISOR assumes that auction settlement prices will be halfway between the price floor and Tier 1 of the allowance price containment reserve.[36] If auction settlement prices are higher, or if the number of allowances allocated to industrial emitters and/or to address offset usage are lower, GGRF revenues could be higher. Understanding the full range of implications for the GGRF requires more analysis than has been provided in the ISOR, but it appears that the proposed regulations would substantially reduce expected GGRF revenues relative to what was anticipated in recent legislation re-authorizing the cap-and-invest program.

Findings and recommendations

1. It is challenging to project the number of allowances made available for auction to fund the Greenhouse Gas Reduction Fund under the proposed regulations, due to the limited technical information made available in the Initial Statement of Reasons.

2. There appears to be a significant disconnect between the revenue projections published in the Initial Statement of Reasons and the funding levels identified in Senate Bill 840, noting that CARB's revenue projections are based on a set of assumptions about allowance volumes and prices that are subject to uncertainty and that actual revenue outcomes could be higher or lower in practice.

3. CARB should clarify how proposed changes to the total allowance budgets and allowance allocation decisions affect the expected number of allowances available to fund the Greenhouse Gas Reduction Fund and the revenues CARB expects for any given assumption(s) about potential future allowance prices.

[35] The fire prevention fee and manufacturing tax credit sunset in 2030 and 2031, respectively, with only the $3 million per year funding for the Climate Bureau remaining in Tier 1 afterwards. As a result, fully funding Tier 2 only requires about $2 billion per year once these Tier 1 appropriations sunset.

[36] CARB ISOR at 320 (see Table 1). For context, in 2026, the allowance reserve price is $27.94 and the APCR Tier 1 price is $65.31, which implies a halfway point of about $46.63. In contrast, the February 2026 auction resulted in a current auction settlement price of $27.94 (i.e., the price floor).