Allowance allocations and financial flows

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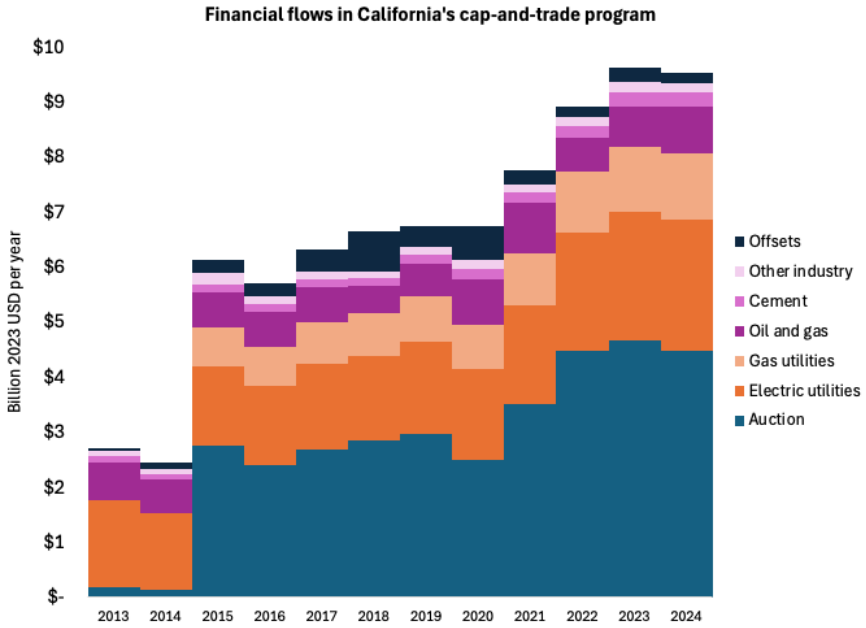
This chapter describes how the total number of allowances authorized each year are distributed to market participants via free allocation and auctioning mechanisms. It also illustrates the approximate financial value of allowance allocations, allowance auctions, and carbon offset credit issuance (Figure 1), based on existing public data from CARB.[1]

CARB's program regulations establish an allowance budget for every program year and designate the number of allowances that are freely given to industrial emitters for leakage prevention, freely given to utilities for the purpose of benefiting ratepayers, and sold at quarterly auctions to raise revenue for the Greenhouse Gas Reduction Fund (GGRF). In addition to the annual allowance budget, CARB's regulations also authorize the compliance use of carbon offset credits. As discussed in [offsets chapter], because these credits are available in addition to the allowance budget; they expand the supply of compliance instruments available in the market.

Figure 1: Summary of financial flows[2]



1 CARB, Cap-and-Trade Program Data Dashboard; CARB, Cap-and-Trade Program Data.

2 Key assumptions: (1) allowance supplies are based on calendar-year allocations, not the date of actual auction sales and (2) allowance and offset prices are annual averages. Because tens of millions of allowances were offered for sale but not purchased in 2016-17, with most purchased later 2017-19, actual revenues differ from what is shown. Note that the program only covered electricity and industrial emitters in 2013-14, and expanded significantly in 2015.

As Figure 1 illustrates, the annual value of allowances entering the market and offset issuance over the last few years has been close to $10 billion per year. The total is about double the value of the money raised from allowance auctions for the Greenhouse Gas Reduction Fund (GGRF) because slightly less than half of the allowances are auctioned, as explained below.

One important caveat should be noted about Figure 1. The financial flows are based on the regulatory schedule for how allowances enter the market during periods of normal demand. When demand is low, allowances may not be purchased at auction. The market regulations provide that when demand increases, previously unsold allowances can be reintroduced and sold at auction. This occurred when demand fell in 2016 and 2017, but recovered following the passage of Assembly Bill 398 in 2017. Most of the unsold allowances were reintroduced and sold in 2017, 2018, and 2019. Figure 1 does not show these dynamics, and for simplicity assumes that allowances are sold on schedule each year. That assumption is reasonable and reliable for recent years, but is not for the period 2016-2019.

Allowance budgets

The cap-and-trade program regulations establish annual allowance budgets and allocate those supplies across four categories (see Figure 2):

- **Auction sales that generate revenue.** About 42–49% of allowances are held by the state and offered for sale at quarterly auctions. Sales of these allowances raise revenue for the Greenhouse Gas Reduction Fund (GGRF), which has collected $4–5 billion per year over the last several years. Revenues depend both on the number of allowances sold and the auction settlement price.[3] A little more than two-thirds of the revenues that come into the Greenhouse Gas Reduction Fund are continuously appropriated, with less than a third subject to the annual legislative appropriations process.[4]

- **Free allocations to industry.** About 10–15% of allowances are freely given to regulated emitters to protect against competitiveness concerns, including the risk that carbon pricing merely “shifts” industrial activity outside of California and causes the associated greenhouse gas emissions to “leak” outside of the program’s boundaries. These concerns are most pronounced for emissions-intensive, trade-exposed industries.[5] The idea behind free allowance allocations is to preserve the incentive to reduce pollution while providing a transfer of resources that reduces the cost of compliance: firms that receive free allocations need to purchase fewer

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3 See Chapter 3 in the IEMAC’s 2020 Annual Report.

4 Legislative Analyst’s Office, The 2024-25 Budget: Cap-and-Trade Expenditure Plan.

5 See Chapter 4 in the IEMAC’s 2018 Annual Report; Chapter 2 in the IEMAC’s 2020 Annual Report; and the final chapter in the IEMAC’s 2021 Annual Report.

allowances to comply with program regulations and can sell those allowances if they can cut pollution at a lower cost than the market price for allowances. Although more than 200 firms receive free allowance allocations across dozens of economically important industries, the allocations are highly concentrated. About 61–72% go to the oil and gas industry (principally oil refineries), another 14–22% go to cement producers, and the remaining 12-17% go to all other industries combined (see Figure 3).[6]

- **Free allocations to utilities.** About 23–30% of allowances are given to electric utilities and 11–12% of allowances are freely given to gas utilities, in both cases for the purpose of benefiting utility ratepayers. Investor-owned electric utilities (IOUs) are required to "consign" their allowances to quarterly auctions and purchase the number they need at auction. Because many IOUs receive more allowances than they need for compliance purposes, they are also required to use any surplus funds collected from the sale of their consignment allowances to benefit their customers, primarily through the on-bill California Climate Credit that all private utility ratepayers receive twice a year. Public electric utilities can use the allowances as they see fit. Gas utilities are also required to use their allowances to benefit ratepayers, including by consigning a growing share of their allowances to auction.[7] The impact of these ratepayer benefits is further described in Chapter [X].

- **Reserve accounts.** Up to a 7% of allowances were transferred to the program's Allowance Price Containment Reserve, where they can be purchased by market participants at specified prices that are higher than historical market prices. To date, no such sales have occurred, although extension and/or reform of the program could lead to market prices reaching levels at which market participants could seek to access these additional allowance supplies at designated reserve sales. A small number of allowances were also set aside in a Voluntary Renewable Energy Reserve and retired to avoid double-counting of climate benefits from the use of voluntary renewable energy credits.[8] All of these allowances have been retired, such that none remain in the Voluntary Renewable Energy Reserve.

The formulas for distributing the annual allowance budget to different applications vary in the current regulations. Some allowance distributions are fully specified in advance, including the number of allowances freely allocated to electric and gas utilities, the number transferred to the Allowance Price Containment Reserve, and the number transferred to the Voluntary Renewable Energy Reserve. In contrast, the formula used to calculate free allocation to industry for competitiveness considerations is based on

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6 CARB, Annual Allowance Allocation Summaries.

7 See California Code of Regulations, Title 17, § 95892 (electric utilities); *id*. at § 95893 (gas utilities).

8 See California Code of Regulations, Title 17, §§ 95870(a), 95871(a), 95913 (allowance price containment reserve); *id*. at § 95481.1 (voluntary renewable energy reserve).

observed industrial production levels times the (annual percentage) cap adjustment factor times a benchmark emissions intensity measure times an assistance factor that reflects emissions leakage risk. These factors are all specified by regulations or legislation except for the observed production levels; hence, the allocation to industry is not fully specified in advance (cross reference EJ chapter).

Offset supplies

As discussed in [offsets chapter #] of this year's report, the supply of carbon offset credits is supplemental to (or "above") the cap-and-trade allowance budgets. As a result, offsets expand the supply of compliance instruments that regulated emitters can use to comply with program rules. CARB reports average prices for offset transactions.[9] Almost 233 million compliance offset credits have been issued to date (net of buffer pool contributions), while about 209 million California-issued offsets have been surrendered for compliance purposes (along with another 1.4 million offsets issued by the Government of Québec).[10]

Undersubscribed auctions

Figure 1 reports the approximate value of allowance allocations and offsets issuance based on the allowance budget determinations made in the program rules. Actual GGRF revenues differ when market participants elect not to purchase all of the allowances offered at auction. This occurred in 2016 and 2017, when concerns about the program's post-2020 legal authority had not yet been resolved. Most of the initially unsold allowances were reintroduced and sold by the end of 2019, while approximately 37 million were transferred to the program reserve accounts.[11] Due to the design of the allowance mechanism, which sells utility-owned consignment allowances first and state-owned allowances only if demand warrants, revenue collected for the Greenhouse Gas Reduction Fund was particularly volatile from 2016-2019. The committee has previously observed that this mechanism prioritizes the stability of utility transfers (including the on-bill climate credit) at the expense of volatility in the Greenhouse Gas Reduction Fund.

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9 CARB, Summary of Market Transfers Report.

10 CARB, ARB Offset Credit Issuance Table (Dec. 24, 2024).

11 CARB, Cap-and-Trade Allowance Report (per Board Resolution 18-51).

Figure 2: Allowance budget shares

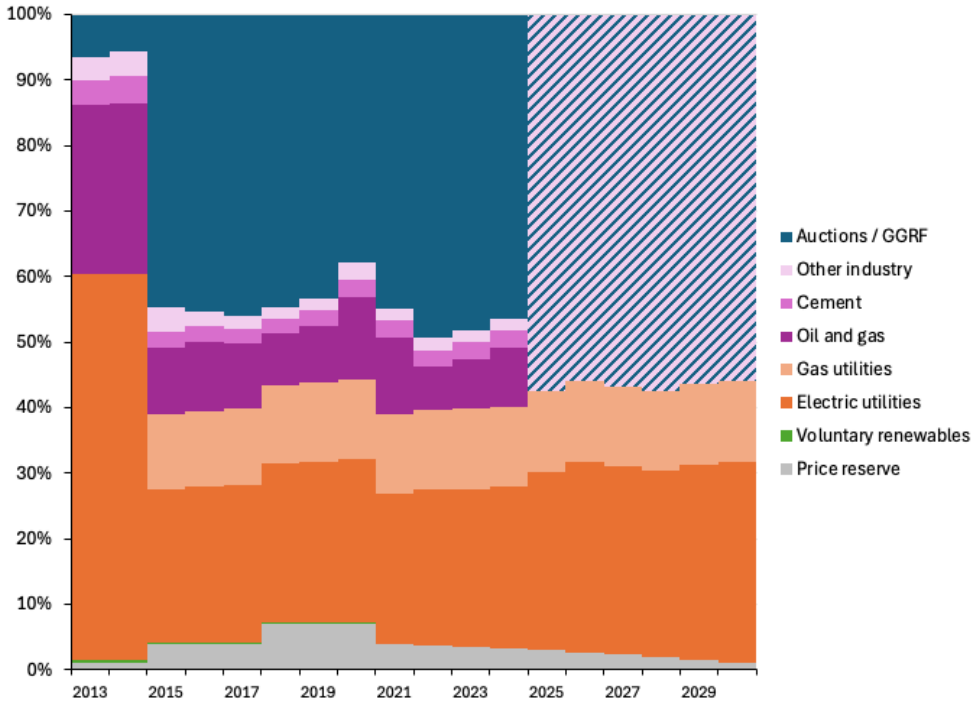
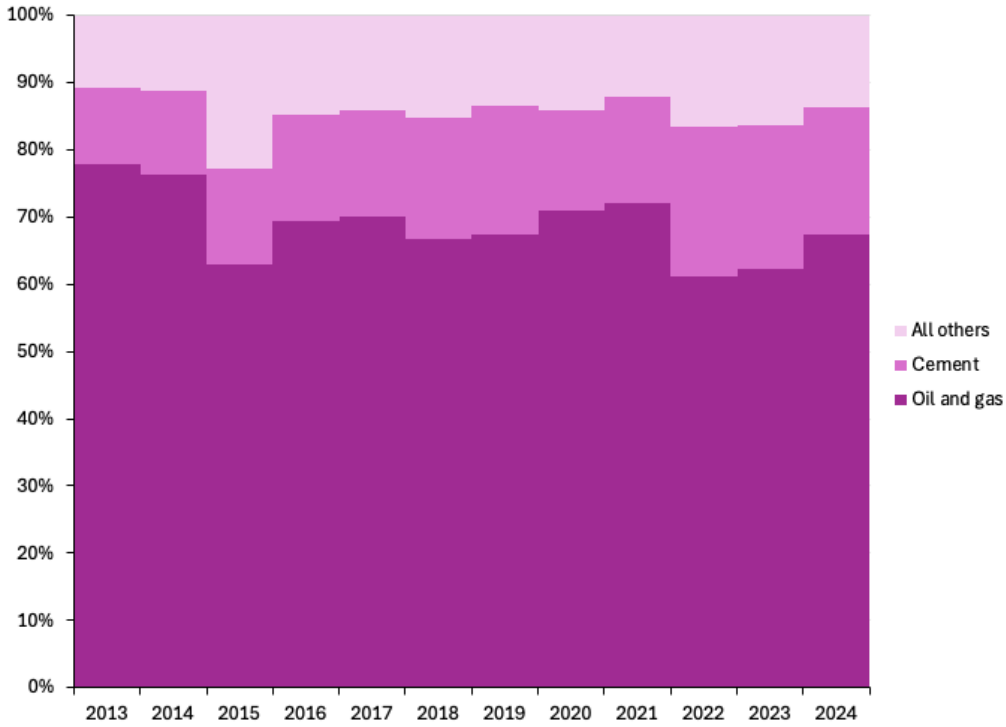


Figure 3: Free allocations to industry by category



Policy options

Policymakers can change the formulas for allocating allowances (covered in this chapter) as well as their approach to carbon offsets (covered in [offsets chapter]). The legislature has generally delegated authority to determine the allocation and auctioning of allowances to CARB. At times the legislature has also provided specific direction. For example, Assembly Bill 398 (Stat. 2017, Ch. 135) directed CARB to maintain the assistance factor that contributes to the calculation of free industry allocation levels that CARB had proposed to reduce;[12] AB 398 also set limits on the use of carbon offsets that were lower than what CARB had authorized in the past, though no statutory limits apply after 2030.[13]

In the context of re-authorization, potential policy interventions include:

- **Prioritizing GGRF revenue.** Increasing the share of allowances directed to auction would increase GGRF revenues, but would require corresponding reductions in other allowance allocations to industrial emitters, electric utilities, and/or gas utilities.

- **Prioritizing ratepayer rebates.** Increasing the share of allowances freely allocated to electric utilities would lead to larger ratepayer rebates for investor-owned utility customers, but would require corresponding reductions in other allowance allocations and/or auctions.

- **Reforming ratepayer benefits.** The legislature could reform the way free allowances are used by electric and/or gas utilities. For example, the legislature could direct the California Public Utilities Commission to direct consumer rebates to low-income consumers (rather than today's practice of issuing rebates to all households), direct consumer rebates to reduce volumetric electricity rates, or impose new conditions on the use of allowance proceeds by publicly owned electric utilities and/or gas utilities. This is further discussed in Chapter XX.

- **Reforming the balance of utility allocations.** The legislature could decide to allocate different shares of free allowances between electric and gas utilities to reflect the state's broader commitment to the electrification of building energy services while preserving overall levels of consumer rebates across electric and gas utilities.

- **Reforming industry allocations.** The legislature could consider additional changes to the formulas used to award free allowances to trade-exposed industries to more closely reflect the risk of leakage on an industry-specific basis, or by prioritizing allocations for industries that are anticipated to maintain substantial activities in a

12 Health and Safety Code § 38562(c)(2)(G).
13 Health and Safety Code § 38562(c)(2)(E).

decarbonized future while de-prioritizing allocations for industries that are expected to diminish or shift focus over the course of the state's energy transition. This is further discussed in Chapter X.

- **Balancing outcomes for undersubscribed auctions.** When demand is lower than supply at quarterly auctions, the current rules prioritize the sale of utility consignment allowances above the sale of state-owned allowances. This ensures that utility transfers are given first priority, but it leads to instability in Greenhouse Gas Reduction Fund revenues. The legislature could balance these interests, such that each type of funding source is affected equally in undersubscribed auctions (see pages 14-16 in the 2020 IEMAC Report).

It is important to emphasize that for any given set of market design choices — issues that include at which level to set the minimum and maximum market prices, and how binding or lax to make compliance instrument supplies in relation to covered emissions — the question of how to distribute value through the allocation of allowances and issuance of offset credits remains. To date, these design questions have largely been delegated to CARB, though in the future they could be guided or even directly specified by statute. Nevertheless, the IEMAC observes that, given the complexity and interactions between policy design details, legislative intervention that directs outcomes for specific regulatory formulas or parameters risks creating unintended consequences and suboptimal outcomes.