

**Independent Emissions Market Advisory Committee**  
**Sub-committee Report on Managing Allowance Supply**

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**A. Context**

The term “overallocation” refers to a market condition where the supply of compliance instruments persistently exceeds emissions. Some independent analysts estimate that the volume of allowances in California’s program, accounting for allowances that will be newly issued after 2020 and the carryover of privately and publicly held allowances from the current period, is large enough to put at risk the State’s ability to achieve its 2030 greenhouse gas limit. ARB projects a smaller difference between cumulative allowances and expected emissions. We identify steps ARB could take to make it possible for the public and market participants to better estimate this market fundamental, as well as mechanisms that could remedy an allowance supply surplus if it is necessary to do so to comply with statutory goals.

**B. Key considerations**

**1. Introduction**

The cap-and-trade program covers approximately 75% of California’s statewide emissions. Although its coverage is broad, the cap-and-trade program is only one of many climate policies in the state. Some regulations affect emitters subject to the cap-and-trade program (called *covered sources*); others apply to emissions outside of the cap-and-trade program. The interaction between the cap-and-trade program and regulations that affect covered sources is important to understanding the costs, benefits, and environmental effectiveness of California’s climate policies. These companion regulations and policies lead to emission reductions at covered sources, reducing those sources’ need for allowances and thereby reducing the price observed in the market. If the price falls to the price floor, the supply of allowances entering the market will be reduced; if the price rises to the cost containment price tiers, the supply of allowances will be increased. Over a large range of price outcomes (that is, at prices above the price floor and below the cost containment price tiers), there is no adjustment to the number of new allowances introduced into the market (see Policy Interactions subcommittee report). Hence, the supply of allowances in the market and emissions from covered sources is uncertain and contingent on future market conditions.

The terms *overallocation* or *oversupply* are frequently used to refer to the concept of the cap-and-trade program’s supply of compliance instruments (i.e., allowances and offsets) exceeding the demand for those instruments (i.e., emissions from covered sources). Because California has achieved its annual emissions reduction target for 2020 four years ahead of schedule, with allowances issued on a pre-determined schedule that is independent of this outcome, any extra allowances that are not needed for compliance through 2020 can be banked, or carried over, for use in subsequent years. This carry over of allowances from the pre-2021 program period triggers two sources of concern. One is that the state may not have been as ambitious as it could have been in its near-term emission reductions goals; a second and somewhat opposite concern is that the surplus of allowances in 2020 that can be banked for future use may cause the state to fail to achieve its goals for 2030.

California’s cap-and-trade program features unlimited allowance *banking*, meaning that market participants can buy and save significant numbers of allowances for future compliance needs. There are two dimensions to banking in the program. One is the ability to bank across years within a multi-year compliance period, and the second is the ability to bank across compliance periods, which together imply unlimited banking as long as compliance period milestones are achieved.<sup>1</sup>

In practice, this means that cap-and-trade with banking functions as a *cumulative* pollution reduction policy: it does not guarantee that emissions fall to any particular level in any given program year or compliance period, but rather that cumulative emissions across multiple compliance periods are equal to or less than the number of compliance instruments made available over that same time horizon. In contrast, California law sets statewide *annual* emissions limits for the years 2020 and 2030. There is a possibility that firms will use allowances banked from previous years to enable higher-than-allowed emissions in 2030. Moreover, it may be that emissions over the ten years covered by the extension to the trading program, from 2021-2030, are greater than the cumulative issuance of new emissions allowances because compliance entities may draw on banked allowances from the pre-2021 program period. In either case, the surplus of allowances currently in circulation could cause emissions to exceed the emissions budget for sources covered by the trading program after 2020.

The statutory obligations apply to emissions on an economywide basis, meaning both sources covered under the trading program and those that are not. Reductions not achieved under the trading program must be achieved elsewhere. Consequently, a transparent understanding of market fundamentals is not only important to the operation of the market, but also to guiding strategy for regulations and policies that apply to uncovered sources.

For context, the 2017 Scoping Plan calls for the cap-and-trade program to deliver a cumulative reduction of 236 million tons of CO<sub>2</sub>e (MMtCO<sub>2</sub>e) in the market’s 2021-2030 period, relative to a scenario that includes the projected effect of all of California’s regulatory measures. The number of new allowances (the emissions cap) to be issued in 2020 is 334.2 MMtCO<sub>2</sub>e; in 2030 it is 200.5 MMtCO<sub>2</sub>e.

## 2. The overallocation debate

The size of the projected surplus after 2020 depends on multiple factors, including the allowance price—which determines the number of allowances purchased at auction and whether allowances in the program’s cost containment reserves are purchased and enter private circulation—as well as future emissions subject to the cap-and-trade program. Several independent researchers and government entities have estimated the number of surplus allowances that will be in private circulation by the end of 2020 and therefore banked for use after 2020:

- 270 (± 70) million allowances (Busch, 2017)
- Between 100 and 300 million allowances (LAO, 2017a)  
Central estimate of 200 million allowances (LAO, 2017b; LAO, 2018)
- More than 300 million allowances (ECO, 2017)

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<sup>1</sup> The proposed regulatory amendments state that “Each compliance period represents either a 2-year or 3-year block in the Program, 2013-2014, 2015-2017, 2018-2020, 2021-2023, 2024-2026, 2027-2029, and 2030 and beyond” (ARB, 2018e: 15). We interpret the year 2030 as a single-year compliance period, which is of course subject to change if the program is re-authorized by statute past its current expiration at the end of 2030.

Most of the allowances that previously went unsold at auction in 2016-2017 because the price was at the price floor are expected to be re-introduced through subsequent auctions and are included in these estimates.<sup>2</sup> Approximately one third of the unsold allowances will be removed from the normal auction supply and transferred to the post-2020 cost containment reserve.<sup>3</sup>

The studies referenced above were published prior to Ontario's exit from the cap-and-trade program, which increased the net supply of compliance instruments by approximately 13 million allowances (Mastrandrea et al., 2018; ARB, 2018b). The proposed regulation addresses this issue by enabling ARB staff to cancel program allowances to account for the excess Ontario allowances currently held by California compliance entities (ARB, 2018e: 75-76).

These studies were also conducted before ARB published data for 2016 emissions, which indicated that emissions were 58.3 million tons below program caps that year, contributing further to the allowance surplus (Cullenward et al., 2017; LAO, 2018). However, the studies may not fully account for several million allowances to be set aside in the voluntary renewable energy program accounts and to be retired in response to a natural gas power plant's bankruptcy proceeding, nor the potential for ARB to retire tens of millions of allowances to account for resource shuffling in the CAISO Energy Imbalance Market (ARB, 2018a: 8-9; see Leakage subcommittee report for additional discussion).

As suggested above, another important factor influencing the assessment is the role of cost containment measures that contain allowances in government-controlled accounts. If prices fall to the price floor, the number of allowances entering private accounts will fall. If demand remains low, some of these allowances will be shifted into cost containment reserve. Even if the price floor is never binding, the proposed post-2020 cost containment reserve will hold 235.9 million allowances, which would begin to enter the market only if the auction price rises to a price tier of \$39.01 (2018\$) in 2021, growing at 5% per year in real terms. Consequently, the total supply of allowances in the market depends on future market conditions.

Of the 239.5 million allowances designated for the post-2020 price containment tiers in ARB's proposed regulations, 160.8 million (67%) originate from the pre-2021 market period (ARB, 2018e: 44 (see Table 8)). These pre-2021 allowances are currently held in government accounts and are therefore excluded from the independent estimates of private banking cited above (Busch, 2017; LAO, 2017a; ECO, 2018).<sup>4</sup> If post-2020 market prices rise to the cost containment price tier levels, then these allowances will also enter the market as part of the allowance supply.

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<sup>2</sup> Each of these studies considers the re-introduction of previously unsold allowances, but it is unclear whether the LAO calculations exclude some 39 million unsold allowances that will be transferred to the allowance price containment reserve as a result of remaining unsold for 24 months (ARB, 2018a; LAO, 2017a; LAO, 2018). Busch (2017: 4) and the Environmental Commissioner of Ontario (ECO, 2018: 4) properly include the transfer of unsold allowances to the reserve (see also Inman et al., 2018b).

<sup>3</sup> All the unsold allowances will either be re-introduced and sold at future auctions or transferred to the post-2020 market reserve. Assuming that the maximum number of previously unsold allowances are sold in the next auction, the total number of allowances transferred to the post-2020 price ceiling will be approximately 39 million (ARB, 2018e: 44 (see Table 8)). This is about 1/3 of the approximately 120 million allowances that went unsold at auction in 2016-17, of which about 2/3 are expected to be purchased at auction and therefore included in private accounts (Inman et al., 2018b).

<sup>4</sup> All three studies exclude allowances in ARB's price reserve accounts, but there is a dispute over whether LAO properly excluded some 39 million allowances that went unsold at auction and will be transferred into the post-2020 price reserves, rather than re-introduced at auction. See footnote 2 for details.

In contrast, ARB (2018a: 8-9) has projected that no more than 150 million allowances are likely to be banked at the end of 2020 and argues this quantity would not put the state’s 2030 climate target at risk.<sup>5</sup> Some analysts (including a member of this subcommittee) argued that the staff report is in error and that the surplus of allowances in 2020 will cause the state to overshoot its 2030 target under the Scoping Plan scenario’s assumptions (Inman et al., 2018a). A legislative oversight committee found similar concerns (JLCCCP, 2018). ARB continues to dispute these issues (ARB, 2018c; ARB, 2018d).

There are no textbook rules or standard methodologies that specify the ideal size of an allowance bank. Typically, economic models that look for least-cost pathways to achieve deep decarbonization under cap-and-trade programs suggest that large allowances banks may form in the early years of a program; however, large banks may only be consistent with a policy goal of limiting cumulative emissions but not necessarily with achieving annual emission limits. Analyzing appropriate banking levels is a highly contextual exercise that depends on the policy goals of the program. Both the Regional Greenhouse Gas Initiative and EU Emissions Trading System cap-and-trade programs have analyzed this question in their own contexts and made program adjustments to affect the size of allowance banks in their respective programs.

Official analysis of California’s cap-and-trade program has evaluated the program as a *quantity* instrument—including the 2008 Scoping Plan, its 2014 update, and the 2017 Scoping Plan, which assume the program will operate as a backstop to limit emissions and ensure the state will achieve its 2020 and 2030 emission limits. However, if the allowance price is at the floor or cost containment price tiers, the supply of allowances will differ from expected levels, and the program may not ensure a specific cumulative or annual emissions outcome. Under these conditions, the emissions outcome will be influenced by *price* impacts. ARB made assumptions about price-induced mitigation in the 2017 Scoping Plan (ARB, 2017: 65) that vary from other studies (Borenstein et al., 2017; Busch, 2018; Cullenward et al., 2018a: 11). There is no analysis in the proposed regulations of what prices are required to deliver the emission reductions called for in the 2017 Scoping Plan. In particular, if the price were to fall to the price floor, it would cause a reduced sale of allowances, but it is uncertain what the emissions outcome would be at the designated price floor level.

Empirical evidence continues to indicate that entities are acquiring more allowances than they need in the short term and the private bank is growing. Emissions subject to the cap-and-trade program are below annual program caps (Cullenward et al., 2017; LAO, 2017b). Yet quarterly auctions continue to clear at prices above the price floor and all allowances are entering the market. As detailed further below, we believe that ARB should develop metrics to track these outcomes empirically and consider regulatory reforms that would automatically adjust allowances supplies in response to the accumulation of an excessively large allowance bank—that is, one that would appear to preclude the market from contributing to the attainment of long-run emission reduction goals.

## **1. ARB’s proposed regulatory amendments**

AB 398 added Section 38562(c)(2)(D) to the California Health and Safety Code, under which ARB is required to:

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<sup>5</sup> ARB assumed that no post-2020 reserve allowances are introduced to the market.

Evaluate 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.

In its proposed regulations, ARB reaffirms its April 2018 staff report calculations and concludes that no adjustment to the cap-and-trade program budgets is warranted (ARB, 2018d: 7-11). Without expressing a view on this question, the subcommittee suggests that going forward, additional technical disclosures and public analysis from ARB would help address the statutory direction on overallocation. One member of this subcommittee has authored a separate statement on the issues addressed here.

### **C. Public comments**

We received comments addressing concerns related to the public's ability to evaluate complex cap-and-trade program reporting data and clarify a common factual understanding of those data with ARB staff. As a general matter, the subcommittee believes it is essential for ARB to produce clearly documented public data that promotes a shared factual understanding of objective program conditions. This norm underlies several of our recommendations below on the need for additional reporting.

### **D. Recommendations**

Conflicting views of market fundamentals highlight a challenge that needs to be addressed by ARB. Current reporting of allowance supplies and associated private account holdings are not sufficiently timely or transparent to facilitate easy analysis of the status of the program. Additionally, the potential differences in outcomes and the likely persistence of uncertainty even with more transparent accounting suggests there may be value in the development of program adjustments that would automatically occur if the accumulation of surplus allowances continues or if it reaches undesirable levels in the context of the state's long-term emissions reduction goals.

To help address the debate over overallocation and mitigate the consequences of impacts that many expect to arise, we recommend that ARB strengthen its data reporting disclosures and analyze three key issues.

- 1. Improve and increase program reporting.** Current program data reporting is helpful, but incomplete. We recommend ARB increase transparency by:
  - a. Reporting allowance holdings by jurisdictional type (i.e., distinguishing between allowance holdings from California, Quebec, and Ontario in quarterly compliance instrument reports).
  - b. Reporting the number, vintage, and jurisdictional totals of allowances that are banked at the end of each three-year compliance period.
  - c. Developing a metric that tracks the bank of compliance instruments on an annual basis, not just at the end of three-year compliance periods (e.g., as developed by Inman et al., 2018c).
  - d. Reporting public data on secondary spot market prices (e.g., weekly averages), as is done for other key climate programs such as the Low Carbon Fuel Standard.

2. **Develop a report on Ontario's withdrawal.** Most observers expected that Ontario would be a net consumer of compliance instruments through 2020. Instead, Ontario's brief participation increased market supply. We recommend ARB develop a report that:
  - a. Analyzes the impact of Ontario's withdrawal on the net supply of allowances in the cap-and-trade program;
  - b. Analyzes whether the impact of Ontario's withdrawal could have been anticipated and mitigated in advance; and
  - c. Evaluates alternative strategies for managing cross-border allowance transfers in future de-linking events.
3. **Develop a comprehensive report on allowance supply.** Given the different assumptions made by public studies, we recommend ARB develop a report that:
  - a. Compares and contrasts all public projections of allowance supply, including the different assumptions and methods used;
  - b. Includes all of the "allowance pools" in the pre-2021 and 2021-2030 market periods in the assessment, including the transfers mandated by AB 398 (see Cullenward et al., 2018b);
  - c. Addresses the "self-correcting" auction mechanism in California's regulations, whereby allowances that go unsold for 24 months are sent to the allowance price containment reserve (Inman et al., 2018b);
  - d. Undergoes a public review process.
4. **Develop a report on options to manage allowance supply.** In parallel to an assessment of overallocation, we recommend ARB develop a report that focuses on options for addressing allowance supply concerns that may manifest in the future, including:
  - a. Adjustments to the price floor, price containment points, and offsets regulations within statutory constraints;
  - b. Replacement of Ontario allowances with California allowances from different "allowance pools";
  - c. Cancellation of allowances or transfers of allowances from future year program budgets into the post-2020 reserve or price containment points;
  - d. Comparison of automatic rule-based adjustments to market supplies versus administrative interventions;
  - e. Implications of any potential interventions on linking arrangements.

## E. References

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