

Attachment A

This report is provided to the California Air Resources Board (CARB or Board) in response to direction in Board [Resolution 18-51](#) (December 13, 2018) regarding the volume of unused allowances following the November 1, 2021 surrender deadline for the third multi-year compliance period¹ of the Cap-and-Trade Program (Program). As part of its approval of amendments to the Cap-and-Trade Regulation (title 17, California Code of Regulations, section 95801 et seq.) (Regulation) in 2018, the Board provided specific direction to the CARB Executive Officer:

“BE IT FURTHER RESOLVED that the Board directs the Executive Officer to quantify and report to the Board, by no later than December 31, 2021, the volume of unused allowance from 2013 through 2020, including volumes held in private accounts, and the potential for unused allowances to hinder the ability of the program to help achieve the [Senate Bill] 32 target. The Executive Officer shall hold a public workshop in 2019 to discuss potential methodologies to evaluate this topic.”

The Board Resolution built on legislative direction contained in Assembly Bill (AB) 398 (E. Garcia, Chapter 135, Statutes of 2017), which required CARB, in adopting a post-2020 Cap-and-Trade Program, to 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. (Health & Safety Code § 38562(c)(2)(D).)

I. Introduction & Background

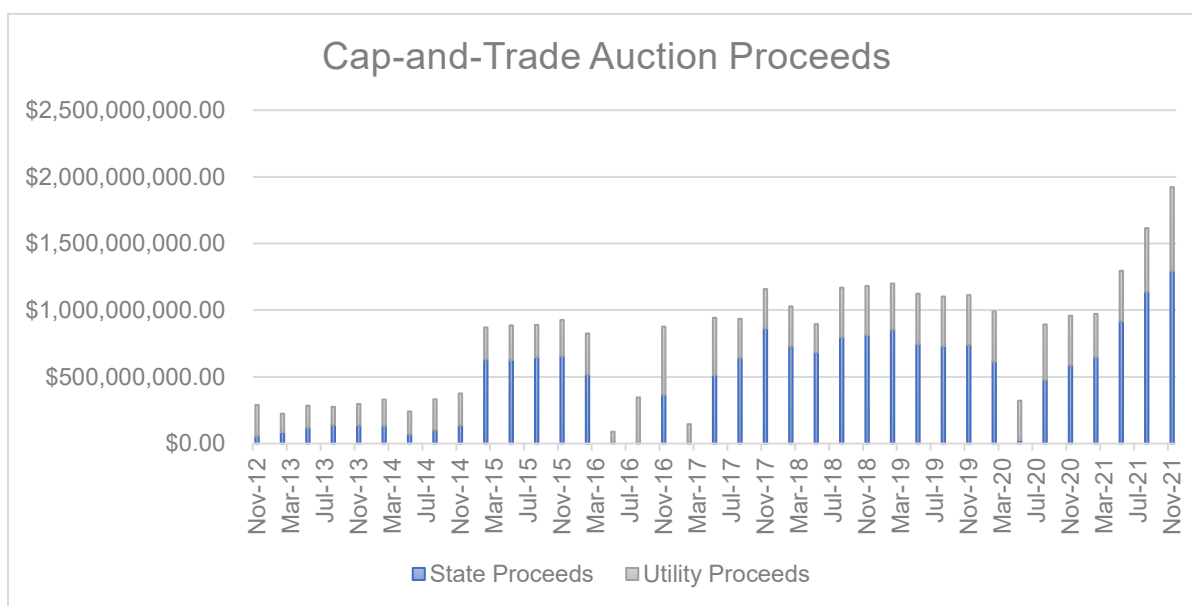
This Board direction stems, in part, from concerns expressed about the Program design over the last several years. First, there have been claims of an oversupply of allowances and low activity at auctions, which some believe reflect a structural issue in the design of the Program.² As described in more detail later in this report, the Program was designed to account for periods of low and high demand for allowances. Figure 1 illustrates total proceeds from the sale of California-issued allowances, including proceeds to the State as well as proceeds from the sale of allowances consigned by electrical distribution utilities and natural gas suppliers. Several auctions in 2016 and 2017, as well as the May 2020 auction, exhibited periods of low demand where not all allowances offered for sale were sold. As an operating market, events

¹ The third compliance period refers to compliance obligations incurred from covered greenhouse gas (GHG) emissions from 2018, 2019, and 2020. The Program’s first compliance period covered GHG emissions from 2013-2014, and the second compliance period covered GHG emissions from 2015-2017.

² An allowance is a limited tradable authorization to emit up to one metric ton of carbon dioxide equivalent. Under the Program, CARB establishes declining caps by issuing declining, annual budgets of allowances, and emitting companies must surrender allowances – and a limited number of offset credits – to CARB to cover their actual GHG emissions. The declining caps, paired with a steadily increasing carbon price, ensure the Program helps the State meet its GHG reduction targets.

external to the Program design have an impact on demand and the results of any individual auction. The undersubscribed auctions in 2016 and 2017 followed a period of political uncertainty about the future of the Program post-2020. The undersubscribed auction in May 2020 followed the start of the global COVID-19 pandemic and subsequent economic downturn.

Figure 1



These results do not reflect a structural flaw in the Program, but rather the types of dynamics that impact all markets. To account for this, the Board included a self-ratcheting mechanism within the Regulation that temporarily removes unsold allowances from the market until either sufficient demand manifests and they are incrementally reintroduced at future auctions or they are permanently removed from general circulation if demand remains low. Figure 1 also shows that because many of these unsold allowances were brought back to auction due to increased demand, proceeds were higher after these periods of low demand because the amount of allowances offered at subsequent auctions was increased with returning unsold allowances.³

Second, some stakeholders believe that because emissions have been lower than the number of allowances available in the Program, then the Program as a whole is not working. With respect to this belief, achieving emissions reduction targets early is a good outcome from the perspective of the atmosphere and a key objective of the Program (i.e., incentivize early action). In addition, it is important to recognize that AB 398 required the Board to institute a price ceiling, which gives rise to the potential for an unlimited number of greenhouse gas (GHG) emissions under the Program if prices

³ As described further in this report, the self-ratcheting mechanism also removed 37,076,922 allowances from general circulation.

rise to the new, legislatively-required price ceiling. The legislature required the imposition of a price ceiling starting in 2021 and specified that if the price ceiling is triggered and eligible allowances available under the Program are exhausted, CARB must make available additional instruments on a metric ton-for-metric ton basis to ensure entities covered by the Program are able to acquire sufficient instruments to meet their emissions obligations.⁴ Thus far, this statutorily-defined provision has not been activated.

Third, if CARB were to pull out any unused 2013-2020 vintage allowances or any corresponding number from future vintages from the market, leading economists who have studied the Program advise that such a removal would increase prices in the Program now,⁵ without any clear, corresponding emissions benefit. Such a move would draw down state-owned allowances from the 2021-2030 allowance budgets, thus potentially decreasing the auction proceeds that would get reinvested in emission reduction priorities of the State. This is because, per legislative direction in AB 32 (Núñez and Pavley, Chapter 488, Statutes of 2006), allowances each year are first distributed to utilities to protect ratepayers, industrial entities to mitigate emissions leakage,⁶ and cost containment accounts, before determining the amount of state-owned allowances that remain for auction.

Finally, as shown in Figure 2, prices have increased over time since the beginning of the Program. While the results of any single auction do not reflect the overall performance of the Program or dictate the results of future auctions, the trend demonstrates that the price signal from the Program is working. This graph shows the steady and increasing carbon price signal established by the Program to date.⁷

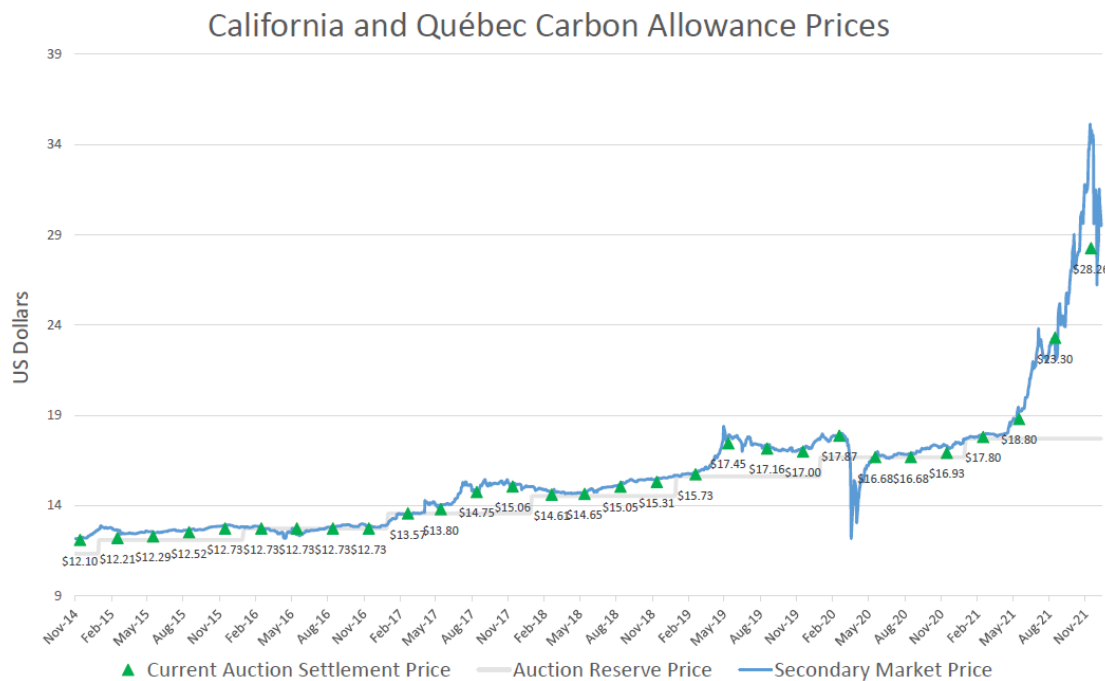
⁴ See [Price Ceiling Information | California Air Resources Board](#).

⁵ See [California's Carbon Cap is Not in Jeopardy, Because It's Not Really a Cap – Energy Institute Blog](#), https://ww3.arb.ca.gov/cc/capandtrade/meetings/20190816/ucb_ct_workshop_16aug2019.pdf, and https://ww3.arb.ca.gov/cc/capandtrade/meetings/20190816/ucd_ct_workshop_16aug2019.pdf.

⁶ With regard to industrial allocation, AB 398 mandated that all industrial sectors receive the highest leakage assistance rate for their allocation.

⁷ Secondary Market Prices are a composite of commodity exchange futures contract prices for near month delivery and a survey of over-the-counter (OTC) brokered transactions for California Carbon Allowances. Secondary market prices are provided with permission of [Argus Media Inc.](#) CARB updates this price [chart](#) on a quarterly basis.

Figure 2



This report lays out staff’s response to Board Resolution 18-51. It provides an evaluation of unused vintage 2013-2020 allowances as of the end of the third compliance period based on the most recent publicly-available data. The additional information section provides a brief summary of the allowance volume analysis already conducted pursuant to AB 398 and resulting regulatory amendments approved by the Board in 2018. It then describes important regulatory context for establishing the current allowance budgets (or caps), as well as regulatory design features that support continued reductions in GHG emissions to support the state’s reduction targets and a steadily increasing carbon price. The report also summarizes the 2019 workshop held pursuant to Board Resolution 18-51.

II. 2013-2020 Allowance Volumes

Based on a foundation of past analysis and discussion, including the topics assessed during the August 2019 workshop, this section of the report provides a more detailed assessment of the current status of unused vintage 2013-2020 allowance volumes pursuant to Board Resolution 18-51.

As a jointly operated market, California and Québec must ensure that we publish data to enable market participants and the public to have an understanding of the Program, while also respecting that certain types of data may be legally prohibited from disclosure, such as confidential business information or information subject to the jurisdiction and legal ownership of a linked partner (e.g., jurisdiction of origin). Since all allowances issued by linked jurisdictions are accepted by all linked jurisdictions and

the information needed to answer the question of unused allowances comes from the total unused allowances in the linked market, the jurisdiction of origin of allowances is not necessary to understand this issue.

To date, CARB and Québec publish quarterly reports that show the movement of compliance instruments – both allowances and offset credits – across various accounts in the jointly shared, secure tracking system (called the Compliance Instrument Tracking System Service, or CITSS). These quarterly Compliance Instrument Reports provide a snapshot in time of allowance volumes in private accounts and in jurisdiction-held accounts. For purposes of assessing the volume of unused allowances, CARB has evaluated the volume of allowances held in private accounts utilizing publicly-available reports including the most recent [Compliance Instrument Report](#) from January 7, 2022 and the [California](#) and [Québec](#) Compliance Reports, which detail all compliance instruments surrendered by California and Québec entities, respectively, against their third compliance period compliance obligations.

The January 7, 2022 quarterly Compliance Instrument Report reflects the location of allowances across private entity accounts (general, compliance, and limited use holding accounts) and jurisdiction-held accounts when that report was generated. From the January 7, 2022 quarterly report, it can be seen that 237,817,027 vintage 2013-2020 allowances were contained in private general accounts, while 83,307,810 vintage 2013-2020 allowances were in private compliance accounts. All other vintage 2013-2020 allowances were held in jurisdiction accounts, including 2,417,360,428 in the retirement account.⁸ Appendix 1 provides the number of allowances per vintage in private entity accounts in aggregated table format.

As of November 1, 2021, the California and Québec 2018-2020 Compliance Reports referenced above show that 1,009,627,327 vintage 2013-2020 allowances had been surrendered for compliance for the third compliance period of the joint market.⁹ Of this amount, 831,792,663 vintage 2013-2020 allowances were newly retired, since 177,834,664 vintage 2013-2020 allowances had already been retired by California entities during the annual surrender events on November 1, 2019 and November 2, 2020.¹⁰

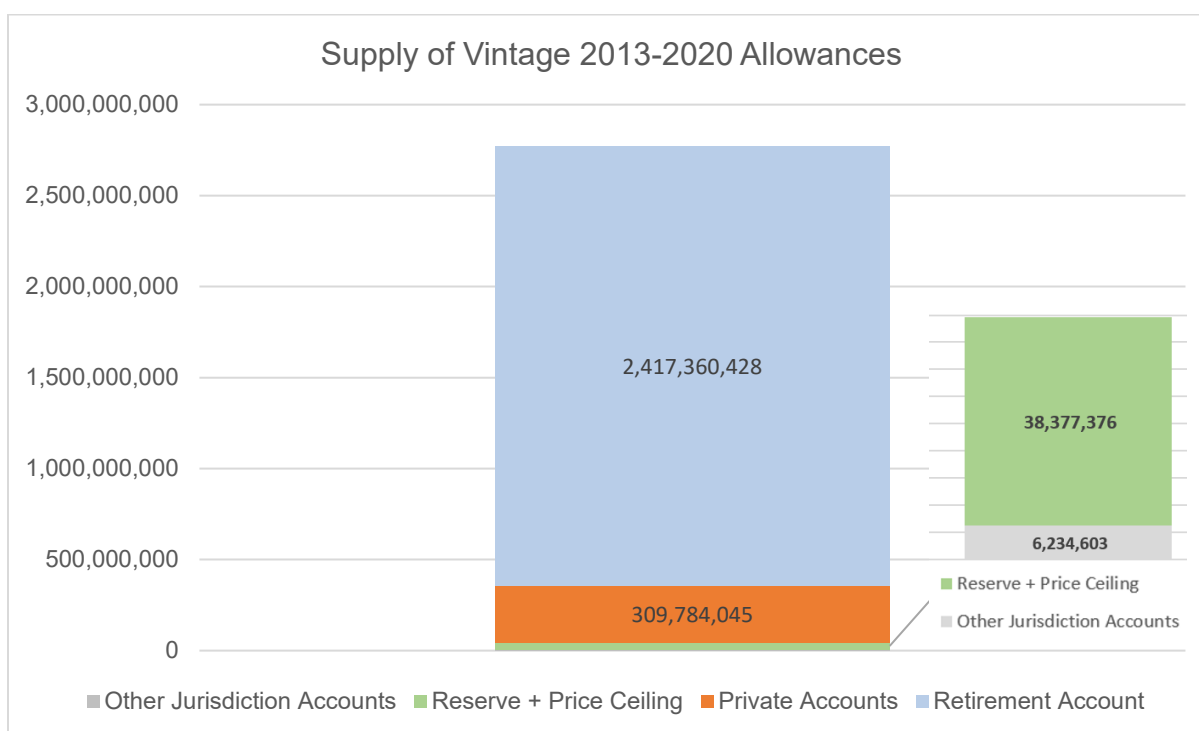
⁸ This amount includes retirements for past compliance surrender events, retirements for the Voluntary Renewable Electricity Program and Energy Imbalance Market, and Québec's retirement of vintage 2017 allowances due to Ontario's departure, as well as voluntary retirements and administrative transfers. Past compliance instrument reports for California and Québec demonstrate that 1,578,397,077 vintage 2013-2020 allowances were surrendered for the first and second compliance periods, as well as California entities' annual surrender obligations for 2018 and 2019 emissions.

⁹ This included 844,993,503 vintage 2013-2020 allowances retired for California entities and 164,633,824 vintage 2013-2020 allowances for Québec entities.

¹⁰ See California [2018 Compliance Report](#) and [2019 Compliance Report](#).

From these public reports, it is possible to show that out of a supply of 2,783,097,244 vintage 2013-2020 allowances,¹¹ 2,417,360,428 vintage 2013-2020 allowances have been placed in the retirement account. From the remaining difference of 365,736,816 allowances, 65,483,707 remain out of general circulation because these are in jurisdiction held accounts (Voluntary Renewable Electricity account, Reserve and Price Ceiling accounts, Environmental Integrity Account) or represent future vintages that have already been retired to handle Ontario's departure. This leaves approximately 310 million vintage 2013-2020 allowances available for private entities, which represents approximately 5% of the total number of vintage 2013-2030 allowances issued within the joint market.¹² Figure 3 depicts the distribution of vintage 2013-2020 allowances across private entity and jurisdiction accounts. More information on how the caps are set in the Program is included in the Additional Information section of this report below.¹³

Figure 3



¹¹ This amount does not include allowances from vintage 2013-2020 that California and Québec converted into non-vintage allowances and designated into the Allowance Price Containment Reserve or the Price Ceiling, pursuant to their respective regulations.

¹² See [Compliance Instrument Report](#) (January 7, 2022).

¹³ Consistent with the description in the paragraph above, Figure 3 depicts the subtraction of allowances retired because of Ontario's departure from the joint market, representing the actual impact on the market (and on private entities) from the removal of 11,340,792 allowances from the market through 2030. More details related to Ontario's departure are discussed in section III below. Note: Appendix 1 of this report does not reflect the impact of this retirement and merely replicates the January 7, 2022 Compliance Instrument Report.

III. Discussion

This report contains the most up-to-date information that is available to CARB staff and the public. As noted above, AB 398 established a price ceiling for the Program beginning in 2021. Essentially, if all allowances are exhausted, CARB would require covered entities to pay for each ton of carbon for which they do not have an allowance. The practical impact of adding the legislatively-directed price ceiling is that there is no hard limit provided by the quantity of allowances in the Program. As detailed in the August 2019 workshops,¹⁴ removal of allowances would therefore be expected to merely shift the price up for those allowances and the appropriateness of such a change would need to be carefully considered in the context of legislative mandates for the Program to be cost-effective, especially as the stringency of the Program substantially increased effective January 1, 2021 (i.e., there is only a very limited track record on the impact of increased stringency of the Program on the demand for allowances and by extension the costs of the Program).

CARB is also in the process of updating the 2022 Scoping Plan, which is due for Board consideration in late 2022. As part of that update, staff will use updated modeling to assess the state's progress towards achieving the SB 32 2030 target and if any changes are warranted to this, or other, programs to ensure we are on track to achieve that target. Board Resolution 18-51 requires this report to be completed following the end of the third compliance period. CARB is committed to using the five-year Scoping Plan update process and annual GHG inventory to monitor the state's progress towards achieving its climate goals and making adjustments to programs as needed.¹⁵ Since the original adoption of the Cap-and-Trade Regulation, the Program has been amended eight times through a robust public process. Moreover, Secretary Blumenfeld testified at a recent Senate hearing that CARB will report back to the Legislature at the end of 2023 giving a status of the allowance supply with any suggestions on Legislative changes to ensure the number of allowances is appropriate to help the state achieve its 2030 target. The end of 2023 will allow for the finalization of the Scoping Plan, additional data points related to the operation of the AB 398 designed program that only came into force in January 2021, and an opportunity to hold public workshops.

It is also worth noting that COVID-19 had significant impacts on economic activity in California and elsewhere. Emissions were significantly lower in 2020 due to the impacts of the global pandemic. There is an expectation that emissions will increase as the economy recovers and behaviors continue to shift from the impacts of the ongoing pandemic. As a result, 2020 should be regarded as an outlier in the emissions trends.

¹⁴ See presentation by James Bushnell, Allowances Supply & Demand: Implications for Cap & Trade Through 2030, at https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/meetings/20190816/ucd_ct_workshop_16aug2019.pdf.

¹⁵ We know the Cap-and-Trade Program doubled in stringency beginning January 1, 2021, however there is currently insufficient data to support any removal of allowances from the system beyond those adjustments described below with such limited experience of a more stringent post-2020 Program having just launched.

This scenario of increasing emissions is similar to what happened in the first compliance period where the state economy was recovering from the Great Recession and does not correlate to a problem with the structure of the Program itself. In any assessment of this and other programs, it is essential to consider external factors such as economic activity and availability of zero carbon energy such as hydro power, among others.

Additional Information

A. Assessing Allowance Volumes Pursuant to AB 398

In developing amendments to the Regulation pursuant to the requirements of AB 398, CARB staff presented a report to the Board in 2018 that evaluated and addressed concerns related to allowance volumes. This evaluation was contained in an appendix to the staff report (2018 Report) prepared for the formal rulemaking process for those amendments.¹⁶ As part of this evaluation, staff focused on whether the allowance budgets established from 2021 through 2030 needed to be adjusted to account for any unused allowances from 2013 through 2020. The caps from 2013 through 2020 were established based on California's GHG inventory and actual reported GHG emissions, and since the Program covers 77.5 percent of the State's GHG emissions, the cap was set to be 77.5 percent of the 2020 target.¹⁷ In establishing the 2021-2030 caps, CARB took a similar approach as the 2013-2020 caps and established the caps to cover 77.5 percent of the 2030 target,¹⁸ which required setting a more stringent, steeper annual decline—moving from about 2% per year through 2020 to about 4% per year through 2030. As described in the next section below, because the State successfully reduced emissions below the 1990 level prior to 2020, CARB factored this accomplishment into the distribution of allowances within the caps for 2021-2030 by removing allowances from general circulation and placing them in the Program's Allowance Price Containment Reserve (Reserve). In the 2018 Report, staff sought to address concerns raised about the possibility that the potential pool of unused allowances from 2013 through 2020 could hinder the ability of the post-2020 period of the Program to deliver the necessary GHG emission reductions needed to achieve the 2030 target established by SB 32.

Based on the evaluation in the 2018 Report, staff found that the currently established caps would constrain GHG emissions from 2013 through 2030. This in turn would support a steadily increasing carbon price signal to prompt the needed actions to reduce GHG emissions. The results of this evaluation showed that while there would be unused allowances in the early years of the Program, the design features of the

¹⁶ See Staff Report: Initial Statement of Reasons, Appendix D – AB 398: Evaluation of Allowance Budgets 2021 through 2030 (September 4, 2018), available at <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/capandtrade18/ct18398.pdf>.

¹⁷ This means that while the statewide target for 2020 was 431 million metric tons of carbon dioxide equivalent (MMT_{CO₂e}), the caps declined to 334.2 MMT_{CO₂e} in 2020.

¹⁸ The 2030 target is 258.6 MMT_{CO₂e}, and the cap in 2030 is set at 200.5 MMT_{CO₂e}.

Program and the established declining caps reinforce a steadily increasing carbon price signal through the next decade. Staff further determined that no changes to allowance supply or banking rules were required at the time and that removing allowances now would only result in higher compliance costs and costs to consumers, which would directly conflict with legislatively-mandated cost-effectiveness in the Program. The Board considered CARB staff's assessment contained in the 2018 Report and approved the amendments with no further changes to the established caps.

B. Important Regulatory Context on Established Caps

Although CARB determined that adjustments to established caps were not required as part of the amendments approved in 2018, CARB has incorporated regulatory adjustments to the available allowance supply based on specific circumstances in past rulemakings. For instance, as explained in the 2018 Report, the Regulation includes a provision that removes allowances that remain unsold at quarterly auctions from circulation during periods of low auction demand and slowly reintroduces allowances back during periods of high demand. This provision supports the escalating floor price and also helps reduce price volatility from changes in allowance demand. This self-ratcheting mechanism was initially included through amendment to the Regulation in 2016, wherein staff included a provision that moves any allowances that remain unsold for eight consecutive auctions to the Allowance Price Containment Reserve (Reserve). This amendment was approved by the Board in July 2017. Additionally, AB 398 included legislative direction on the treatment of unsold allowances, which is consistent with these amendments. This mechanism has already proven to be effective. Due to low demand for allowances at auctions in 2016 and 2017, a total of 37,076,922 allowances were transferred to the Reserve and removed from general circulation.

In addition, in establishing the allowance budgets from 2021-2030, CARB withdrew 52,400,000 allowances from general circulation and placed these into the Reserve to align the post-2020 allowances supply with updated GHG estimates showing California had met the 2020 GHG reduction target earlier than expected. CARB also amended the Regulation to permanently remove 22,700,000 allowances from general circulation to reflect changes to the offset usage limit established by AB 398. Moreover, following Ontario's departure from the linked market in 2018,¹⁹ there were 13,186,967 more allowances held in California and Québec accounts than the total number of allowances issued by those two jurisdictions alone. To maintain the environmental stringency of the linked market, California and Québec respectively

¹⁹ On July 3, 2018, the Ontario government published a regulation (386/18) revoking Ontario's Cap-and-Trade Regulation (144/16) and suspended all Ontario entity accounts. With Ontario's departure from the linked carbon market, California and Québec worked together to ensure that the environmental integrity and stringency of each respective cap-and-trade program and market was maintained. CARB's goal was to make certain that California's Program continued to reduce emissions of climate-changing gases as a crucial part of California's efforts to combat the existential threat of climate change, while also continuing the smooth operation and integrity of the linked California and Québec carbon market.

retired 11,340,792 and 1,846,175 allowances to account for the remaining Ontario allowances. California retired an equal amount of vintages 2021 through 2030 and Québec retired vintage 2017 allowances.

Each of these examples demonstrate that, when necessary, CARB has adjusted allowance supply and implemented the self-ratcheting mechanism to remove allowances from general circulation when demand is low.

C. Allowance Prices & Program Design

It is also helpful to understand the underlying design of the Program's pricing mechanisms and how those result in a steadily increasing carbon price signal to prompt the needed actions to reduce GHG emissions. For instance, the Program establishes an auction price floor that ensures a steady and increasing carbon price. In addition, pursuant to AB 398, the Program sets a price ceiling which provides a firm limit on the cost of compliance. The price ceiling is a legislatively-mandated cost-containment mechanism in the unlikely event that allowance prices, or the cost of achieving GHG emissions reductions under the Program, are higher than anticipated. These features, combined with the self-ratcheting mechanism described in section 3 above, help ensure the program is able to handle periods of high and low demand for compliance instruments, while continuing to ensure a steadily increasing price signal. Figure 2 above depicts the floor price, auction settlement prices, and secondary market prices to date. It is also important to recognize that while the Cap-and-Trade Program helps establish a steadily increasing carbon price for purposes of the economy-wide Cap-and-Trade Program, this is not the sole element of a carbon price in California. Complementary measures such as the Renewables Portfolio Standard (which imposes a cost on renewables procurement) and the Low Carbon Fuel Standard (which imposes a higher cost on higher carbon-intensive fuels), also factor into the true cost of carbon within California. In other words, the auction floor price, as well as the allowance price containment tiers and price ceiling, provide cost containment only on the portion of GHG reductions that will be achieved through the Program and do not reflect the cost of achieving all the reductions needed to achieve the 2030 target. This is why California relies on a portfolio of programs to achieve our GHG reduction targets.

Finally, based on this portfolio approach to date, California's GHG emissions (in total, and from both a per capita and per gross domestic product standpoint) have continued to decline.²⁰

D. August 16, 2019 Public Workshop

²⁰ See CARB, California Greenhouse Gas 2000-2019 Emissions Trends and Indicators Report (2021 Edition), available at https://ww2.arb.ca.gov/sites/default/files/classic/cc/ghg_inventory_trends_00-19.pdf.

Pursuant to Board Resolution 18-51, CARB staff held a public workshop on August 16, 2019 to discuss potential methodologies to evaluate the volume of unused allowances from 2013 through 2020.²¹

CARB staff outlined much of the above analysis, as well as some initial thinking on the types of information to include in this report, during the workshop. This workshop was designed to allow CARB staff to hear from experts and the public on evaluating and understanding the impacts of allowance supply on the Post-2020 Cap-and-Trade Program. The workshop consisted of a moderated panel discussion with experts familiar with the California Cap-and-Trade Program and emissions trading systems.²² It focused on the direction in Board Resolution 18-51 to evaluate the volume of unused allowances from 2013 through 2020, including volumes held in private accounts, and the potential for unused allowances to hinder the ability of the Program to help achieve the SB 32 target. Presenters discussed the price floor and price ceiling design of the Program, the importance of positioning the state to achieve reductions beyond 2030, risks of adjusting the allowance supply, and considerations for adjustments should they be needed in the future.

²¹ [Cap-and-Trade Workshop: Evaluating Allowance Supply \(govdelivery.com\)](https://govdelivery.com)

²² These experts included Professor Severin Borenstein from UC Berkeley, Dallas Burtraw from Resources for the Future, and Professor James Bushnell from UC Davis. Materials from the workshop are available here: [Cap-and-Trade Meetings & Workshops | California Air Resources Board](#).

Appendix 1

WCI-wide allowance holdings in Private Entity Accounts (General, Compliance, LUHA) as of January 7, 2022

Type	Issuing Jurisdiction		Total
	California	Quebec	
Allowances Vintage 2013			910,480
Allowances Vintage 2014			1,047,533
Allowances Vintage 2015			2,090,222
Allowances Vintage 2016			11,831,643
Allowances Vintage 2017			18,710,451
Allowances Vintage 2018			38,496,806
Allowances Vintage 2019			79,092,738
Allowances Vintage 2020			168,944,963
Non-Vintage Quebec Early Action Allowances		17,797	17,797
Non-Vintage Price Containment Reserve Allowances			26,332
Total Allowances			321,168,966

Note: CARB cannot publish the jurisdiction of origin of allowances (outside of non-vintage Quebec Early Action allowances) for legal jurisdictional reasons. The jurisdiction of origin is not necessary to assess the current supply of compliance instruments or to understand the number of vintage 2020 and earlier vintage allowances banked prior to the end of the third compliance period. This table provides all instruments in private entity accounts as of January 7, 2022. Source: Worksheet (2021 Q4) Columns B-D of the Workbook "Linked California and Québec Cap-and-Trade Programs Carbon Market Compliance Instrument Report - Aggregated by Type and Account" (released January 7, 2022) available at https://ww2.arb.ca.gov/sites/default/files/2022-01/nc-2021_q4_complianceinstrumentreport.xlsx.