



March 16, 2018

Dear ARB Board Members and staff,

Thank you for the opportunity to comment on the materials provided for ARB's March 2018 workshop on the implementation of AB 398's cap-and-trade program reforms. Our comments today focus on two issues: ARB's overall market design proposal and staff's proposed interpretation of AB 398 offsets limits. We will keep our comments brief and refer staff to more extensive analysis contained in two attached Near Zero Research Notes.¹

1. Pursuant to AB 398, ARB still needs to evaluate market oversupply conditions and allowance banking regulations.

AB 398 requires ARB to "[e]valuate and address concerns related to overallocation"² in the cap-and-trade program and "[e]stablish allowance banking rules that discourage speculation, avoid financial windfalls, and consider the impact on complying entities and volatility in the market."³ The Board's March 2018 workshop materials include some discussion of these requirements, but do not evaluate either issue. Staff has requested further stakeholder input on these topics.

¹ Danny Cullenward, Mason Inman, and Michael Mastrandrea (2018a), Implementing AB 398: ARB's initial post-2020 market design and "allowance pool" concepts. Near Zero Research Note (Mar. 16, 2018) (attached here as Attachment 1); Danny Cullenward, Mason Inman, and Michael Mastrandrea (2018b), Interpreting AB 398's offset limits. Near Zero Research Note (Mar. 15, 2018) (Attachment 2 here).

² Cal. Health & Safety Code § 38562(c)(2)(C).

³ *Id.* at § 38562(c)(2)(H).

Troublingly, ARB staff have indicated that they view the current oversupply of allowances in the market as a sign of its success, not a result of relative program laxity.⁴ Staff present no evidence to support this view.

Without mentioning any of the various independent studies and reports that have concluded the market is experiencing a significant oversupply condition—including analysis from the Legislative Analyst’s Office,⁵ the Environmental Commissioner of Ontario,⁶ Energy Innovation,⁷ Near Zero,⁸ and the Carbon Market Compliance Association,⁹ to name only a few—Board staff suggest that the “relationship between GHG reductions and carbon price requires a more thoughtful and in-depth evaluation – not simply [an analysis of] supply vs. demand.”¹⁰ If the Board believes that there are methodological deficiencies with these existing conclusions, it should make more specific criticisms and identify a better approach. We identify the elements of an oversupply calculation the Board should

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- ⁴ ARB, Amendments to the Cap-and-Trade Regulation Workshop (March 2, 2018), slides 22-24.
- ⁵ Legislative Analyst’s Office (2017), Cap-and-Trade Extension: Issues for Legislative Oversight (Dec. 12, 2017), <http://lao.ca.gov/Publications/Report/3719>.
- ⁶ Environmental Commissioner of Ontario (2018), Ontario’s Climate Act: From Plan to Progress, Appendix G: Technical Aspects of Oversupply in the WCI Market, <https://eco.on.ca/reports/2017-from-plan-to-progress/>.
- ⁷ Chris Busch (2017), Oversupply grows in the Western Climate Initiative carbon market: An adjustment for current oversupply is needed to ensure the program will achieve its 2030 target. Energy Innovation LLC Report.
- ⁸ Danny Cullenward, Mason Inman, and Michael Mastrandrea (2017), California’s climate emissions are falling, but cap-and-trade is not the cause. Near Zero Research Note, <http://www.nearzero.org/wp/reports/>.
- ⁹ Comment letter from Andre Templeman (CMCA) to Richard Corey (ARB) (Sept. 15, 2016) (estimating oversupply at up to 300M allowances), available in ARB, Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanism: Final Statement of Reasons (Aug. 2017), 499-500, <https://www.arb.ca.gov/regact/2016/capandtrade16/ctfinsor.pdf>.
- ¹⁰ ARB workshop presentation, supra note 4, slide 23.

consider and would be glad to provide additional information to assist ARB staff.¹¹

Although ARB staff officially dispute the view that today's oversupply condition puts the program's environmental performance at risk, we note that the Board's proposed allowance pool concept would transfer some of the excess allowances in the post-2020 program budgets to the new price containment points and/or the price ceiling.¹² The total number of allowances that would be transferred under ARB's proposal is 75.1 million allowances. While removing this quantity of allowances from the auction supply curve could help address market oversupply conditions, the total transfers represent only 28% of Chris Busch's central estimate of market oversupply in 2020 (270 ±70 million allowances).¹³ They are therefore insufficient to address the extent of market oversupply documented by credible, independent studies.

We are preparing our own estimate of the number of compliance instruments banked at the end of 2017, beyond entities' expected compliance obligations. We believe our analysis will show strong evidence that substantial banking has already occurred. As soon as this analysis is complete, we will send it to ARB and also release it publicly. Because ARB has made several public statements arguing that market participants are not banking significant amounts of allowances beyond their need for emissions already incurred,¹⁴ we strongly encourage ARB to perform its own analysis and publish the results, methods, and underlying data.

¹¹ Cullenward et al. (2018a), supra note 1 at Appendix 2 (see Attachment 1 to this letter).

¹² ARB, Preliminary Concepts: Price Containment Points, Price Ceiling, and Allowance Pools (Feb. 2018).

¹³ Busch (2017), supra note 7.

¹⁴ See, e.g., ARB, Responses to Questions, for Joint Oversight Hearing of the Senate Environmental Quality Committee and Senate Budget and Fiscal Review Subcommittee No. 2 on Resources, Environmental Protection, Energy and Transportation (Jan. 17, 2018).
http://senv.senate.ca.gov/sites/senv.senate.ca.gov/files/arb_responses.pdf.

- 2. Rather than dispute the cause of market oversupply, ARB should consider how to develop a post-2020 market design that manages a transition from today's low prices to the higher prices that are likely needed to achieve California's 2030 target.**

Today's market prices are low because the supply of compliance instruments significantly exceeds near-term demand. Eventually, oversupply conditions will diminish and, absent a recession or major technological breakthroughs, carbon prices will likely rise—potentially to significantly higher levels. However, ARB staff have proposed a market design that does not include mechanisms to actively manage a gradual transition. By relying on market oversupply conditions to keep near-term prices low, the Board's proposal defers serious action, risks rendering the program ineffective at reducing emissions in the short term, and creates a political liability for the next administration to manage.

We urge the Board to consider an alternative approach wherein oversupply conditions are carefully managed via program cap adjustments, banking rules that discount the value of banked allowances, and/or other creative approaches developed collaboratively with stakeholders. Instead of relying on oversupply to manage prices—a strategy that will eventually stop working as caps decline in the years to come—the Board might consider setting price containment points at lower levels and implementing a graduated price ceiling that starts at a lower initial price and increases more rapidly over time. We note that these alternative cost containment strategies are warranted only if ARB simultaneously resolves market oversupply conditions; if combined with no action on oversupply, they would only weaken the status quo market design.

- 3. ARB needs to indicate how its proposed post-2020 offset limits are consistent with the legislative intent in AB 398.**

ARB has proposed interpreting AB 398's post-2020 offset limits in a way that substantially increases the number of allowable offset credits

in the years 2024 and 2025. Rather than apply the AB 398 offset limits on a calendar year basis—in which case 2024 and 2025 emissions would be subject to the lower 4% limit—ARB has proposed applying the higher 2026 calendar year limits (6%) to the bulk of compliance obligations associated with emissions in calendar years in 2024 and 2025.¹⁵

We calculate that this interpretation would increase the number of permissible offset credits by approximately 8.5 million, relative to a scenario in which the AB 398 limits applied on a literal calendar year basis and assuming covered entities' emissions are equal to program year allowance budgets plus maximum allowable offsets in each scenario.¹⁶

ARB has not justified its interpretation as being consistent with the statutory text in AB 398, which appears to apply to calendar year limits. ARB should explain how its proposed interpretation is consistent with the legislative intent behind AB 398.

4. ARB should exclude consideration of greenhouse gas emissions from its proposed bottom-up determination of an offset project's "direct environmental benefits."

In addition to setting overall limits on offsets usage, AB 398 also requires that no more than half of total post-2020 offsets limits come from projects that do not provide a "direct environmental benefit" ("DEB") to California air or water quality.¹⁷ ARB has proposed a bifurcated approach to determining a DEB wherein certain bright-line conditions would automatically qualify an offset project as providing a

¹⁵ ARB workshop presentation, *supra* note 4, slide 25.

¹⁶ Cullenward et al. (2018b), *supra* note 1 (see Attachment 2 to this letter).

¹⁷ Cal. Health & Safety Code § 38562(c)(2)(E).

DEB while allowing all other projects the opportunity to make an individualized case as to whether or not they provide a DEB.¹⁸

We agree that a bifurcated approach to determining a DEB could, if executed carefully and consistently, fairly balance the need for program flexibility with AB 398's statutory requirements. However, if the Board elects this approach, it is critically important that ARB identify arguments that cannot be used to demonstrate a DEB.

Specifically, ARB should clarify that offset projects may not argue that their gross avoided or reduced GHGs generate a DEB. Offset projects produce no net GHG reductions because for every avoided or reduced GHG emissions, ARB awards an equal number of offset credits that will eventually be used by covered entities to increase their own GHG emissions by the same amount the offset project reduces or avoids. Thus, there is no basis whatsoever for an offsets project to claim a DEB on the basis of its gross GHG reductions.¹⁹ Accordingly, ARB should explicitly foreclose this argument in whatever process the Board ultimately adopts for determining whether or not an offsets project provides a direct environmental benefit to state air or water quality.

5. ARB needs to show how its proposed market design is consistent with the role the Board identified for cap-and-trade in the final 2017 Scoping Plan.

Finally, we reiterate the need for ARB to show how the market design it selects in the AB 398 implementation process is consistent with the large role the Board identified for the cap-and-trade program in its final 2017 Scoping Plan. The cap-and-trade program was identified as the single largest contributor to California's climate goals, representing 38% of the required cumulative emission reductions over

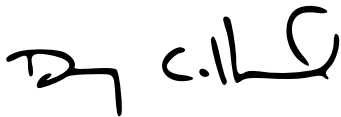
¹⁸ ARB, Preliminary Discussion Draft of Potential Changes to the Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms (Feb. 2018), at 17-19.

¹⁹ Cullenward et al. (2018b), supra note 1 (see Attachment 2 to this letter).

the period 2021-2030²⁰ and almost 47% of the annual reductions projected for the year 2030.²¹ Whatever choices ARB makes in implementing its discretionary authority under AB 398 should be consistent with the role ARB identified for the cap-and-trade program.²²

We appreciate that the design choices facing ARB require difficult policy judgments and complicated technical analysis. Nevertheless, we urge ARB to be transparent in its process and to address the fundamental challenges present in the current market. If we can provide analytical support to the ARB in the future, please feel free to contact us.

Sincerely,



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Disclaimer: Dr. Cullenward is a member of the California Independent Emissions Market Advisory Committee; however, this letter does not represent the official views of the IEMAC.

²⁰ ARB, 28.

²¹ *Id.* at 26.

²² We expressed this view in the Scoping Plan process. See Comment letter from Michael Mastrandrea and Mason Inman (Near Zero) to Rajinder Sahota (ARB) (Oct. 27, 2017), <http://www.nearzero.org/wp/2017/10/27/cap-and-trade-2030/>.

Attachment 1:

Danny Cullenward, Mason Inman, and Michael Mastrandrea (2018a),
Implementing AB 398: ARB’s initial post-2020 market design and
“allowance pool” concepts. Near Zero Research Note (Mar. 16, 2018).

Attachment 2:

Danny Cullenward, Mason Inman, and Michael Mastrandrea (2018b),
Interpreting AB 398’s offset limits. Near Zero Research Note (Mar. 15,
2018).

Implementing AB 398: ARB’s initial post-2020 market design and “allowance pool” concepts

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AB 398 requires the California Air Resources Board (ARB) to make several important reforms to the cap-and-trade program’s post-2020 market design. For example, the statute requires ARB to implement a hard price ceiling at which unlimited compliance instruments will be offered for sale at a fixed price; establish two new price containment points at which limited quantities of allowances will be made available at a fixed price; and impose new limits on carbon offsets, to name only a few changes.

Earlier this month, ARB released its initial thinking on how to implement the post-2020 market design reforms required by AB 398 (ARB 2018a, 2018b, 2018c). As a threshold matter, it is important to observe that ARB has not yet addressed two key issues on which AB 398 requires further evaluation—potential changes to banking rules and adjustments for over-allocation (also known as oversupply). Both of these statutory provisions require ARB to consider the extent to which the current cap-and-trade program has too many allowances relative to near-term demand. So far, ARB has characterized lax market conditions as a success, not a liability.

On the whole, ARB’s proposal (summarized in Appendix 1) features high long-term price ambitions, but no serious efforts to balance long-term mitigation needs against near-term oversupply conditions.

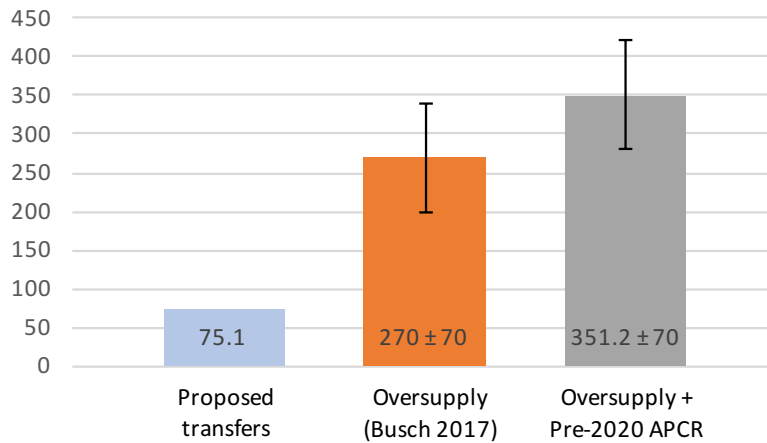
Key features of ARB’s proposal include:

- **High long-term price ambitions.** ARB has proposed setting two new price containment points no lower than \$70 per allowance in 2021 (2015 USD), and has suggested the new market price ceiling will, in 2030, be no lower than \$81.90 and no higher than \$147 per allowance (2015 USD). Pursuant to AB 398, ARB must offer unlimited additional compliance instruments for sale at the price ceiling. The ambition of the price containment point and price ceiling would allow allowance prices to rise substantially from recent levels, which remain near the

price floor (just under \$15 per allowance). Price increases significantly above the floor are likely necessary to achieve California’s ambitious 2030 climate target.

- **No serious action on oversupply.** Board staff continue to argue that the oversupply of allowances currently present in the program is a sign of the program’s success, rather than a reflection of the program’s lack of stringency (ARB 2018a: 22-24). ARB has offered no evidence to support this view. Staff also suggest that oversupply has no potentially deleterious effects, despite the findings of multiple independent studies that have identified serious environmental risks (e.g., Busch 2017, Cullenward et al. 2017, LAO 2017, Environmental Commissioner of Ontario 2018). However, the staff presentation indicates ARB has received stakeholder feedback calling for reductions in the number of allowances under the program caps and/or rules to adjust the value of banked allowances over time (ARB 2018a: 22).

Allowance pool transfers vs. market oversupply in 2020
(million allowances)



Despite disputing the risks of current market oversupply conditions, ARB’s proposed “allowance pool” transfers (ARB 2018c) would take modest action to address oversupply risks. ARB has proposed transferring up to 75.1M allowances from the post-2020 annual allowance budgets into two new price containment points. While these transfers are not equivalent to removing excess allowances from the market and therefore do not fully resolve concerns related to market oversupply, ARB’s proposed transfers would make these allowances more expensive to purchase and therefore would tend to incentivize greater GHG reductions relative to the status quo. However, the magnitude of any

potential benefits will depend on where ARB ultimately sets the price level of the two price containment points.

On the other hand, the scale of the proposed transfer (up to 75.1M allowances) represents only a small share of market oversupply projected through 2020 (270M \pm 70M allowances) (Busch 2017). These calculations do not include the excess 81.2M pre-2021 APCR allowances AB 398 requires ARB to place in two post-2020 price containment points. If market prices reach these levels, allowances in the price containment points will contribute to projected oversupply conditions (raising the total to 351.2M \pm 70M allowances).

- **No mechanism for managing a transition from low to high prices.** The likely consequence of extending the market design without adjusting for oversupply is that market prices are likely to stay low for several years, during which time the supply of allowances will exceed near-term demand and prices will likely incentivize relatively few GHG reductions from the cap-and-trade program. Eventually, declining program caps will become binding and likely lead to a transition to higher carbon prices. This presents two related problems. First, low prices in the near term may lead to regulated entities' underinvestment in GHG mitigation in advance of a market transition from low to high prices. Second, carbon prices may rise significantly and quickly once emitters consume the extra allowances in the market (i.e., as market oversupply conditions fade).
- **Tension between near-term price impacts and encouraging action to reduce climate pollution.** ARB's initial thinking on the trade-offs between program stringency and laxity indicate that the Board is particularly concerned about limiting near-term price impacts (ARB 2018a: 23). We believe there are technical reforms that could enable dynamic adjustments to program allowance budgets and/or banking rules that respond in real time to relative program laxity based on empirical metrics. Some of these interventions could improve market stringency while deferring price impacts to a later point in time. However, there is no avoiding the fundamental trade-off between price impacts and GHG emission reductions. No market design can guarantee large emission reductions at low prices. Deferring adjustments to program stringency would delay and likely reduce total GHG reductions from the cap-and-trade program.

- **No analysis of how the proposed market design will achieve the role identified for cap-and-trade in the 2017 Scoping Plan.** Finally, we note that the preliminary discussion draft of ARB’s proposed regulations does not include any analysis that substantiates the role ARB identified for cap-and-trade in its 2017 Scoping Plan. We understand that ARB may be planning to release more information in the future. In particular, it will be important for ARB to illustrate how any trade-offs it proposes with respect to cap-and-trade program stringency are likely to deliver on the reductions needed to close the gap between California’s regulatory programs and the Scoping Plan scenario.

There are no easy answers to the challenges identified above. Fundamentally, however, we believe ARB will need to manage a transition from today’s low prices to significantly higher prices in the years to come. Rather than dispute the cause of today’s low prices and avoid discussion of the need to increase program stringency to defer price increases, ARB may wish to consider how proactive market reforms could enable an earlier and more gradual carbon price trajectory that contributes to the state’s ambitious climate targets. With the goal of informing a constructive discussion, we offer two conceptual thoughts:

- **Price containment point prices interact with market oversupply concerns.** ARB’s proposal to set the two post-2020 price containment points at relatively high price levels (starting in 2021 at no lower than \$70 in 2015 USD) has important advantages and disadvantages.

On the one hand, this approach would largely avoid exacerbating market oversupply conditions by making a sizeable supply of excess allowances (at least 81.2M) available only at high prices (no less than \$70 per allowance)—almost five times higher than today’s costs (about \$15 per allowance). So long as the market price remains below the price containment points, these excess allowances won’t contribute to market oversupply. If market prices reach these levels, however, the allowances sold from the price containment points would enable higher GHG emissions and contribute to market oversupply. For the same reasons, if ARB were to set the price containment points at low price levels, the excess allowances in these accounts would likely enter circulation and exacerbate the market’s oversupply problem.

ARB’s proposal also has an important downside. Although high price containment points avoid worsening market oversupply—so long as

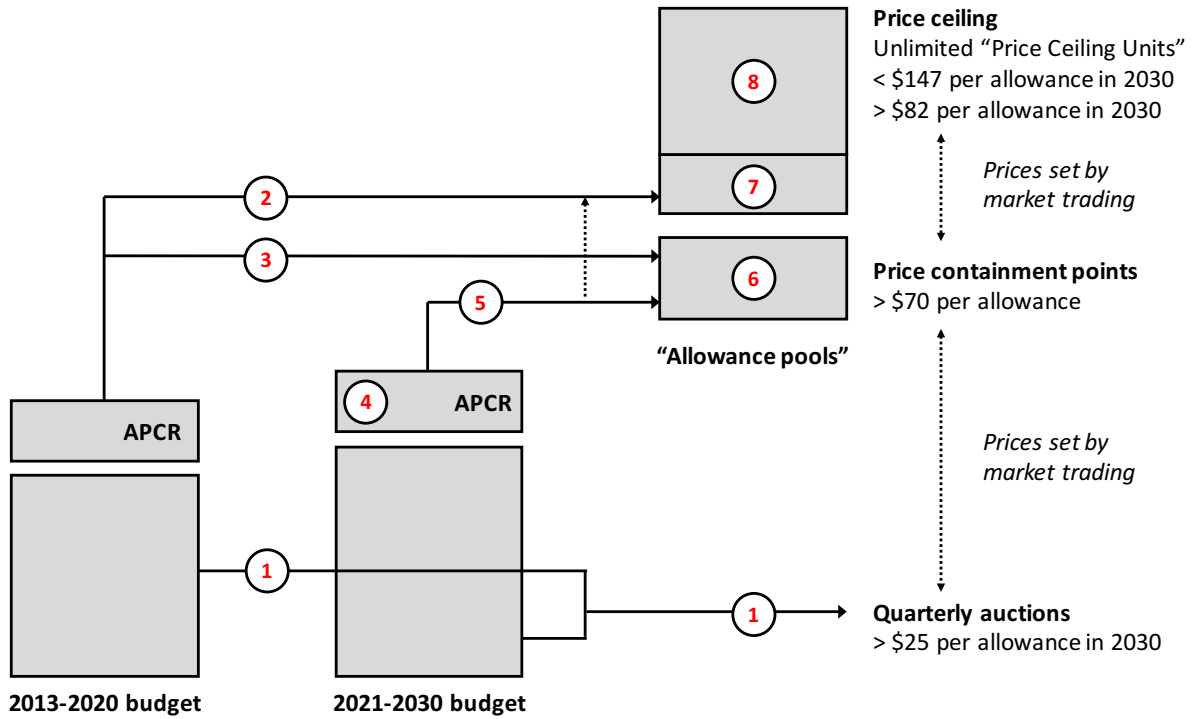
prices stay below the containment points—the Board’s proposal does not mitigate potential carbon price volatility in between current prices (\$15) and the proposed price containment points (starting in 2021 at no lower than \$70 in 2015 USD). Thus, ARB’s proposed market design creates the potential for a disruptive market transition in the early 2020s (as oversupply conditions fade) without any guarantee of significant GHG emission reductions prior to that time (due to low prices from the near-term oversupply conditions).

- **An alternative paradigm for managing the transition to higher carbon prices?** To date, the cap-and-trade program has experienced low prices as a result of oversupply conditions, which themselves are attributable to the economic recession, the success of California’s other clean energy policies, and reductions in the cost of low-carbon technologies (Cullenward et al., 2017). In this paradigm, carbon prices remain low so long as the supply of allowances exceeds near-term demand, but there are no mechanisms in the current market design to ensure an orderly transition from low to high prices once oversupply conditions are gone. The fundamental challenge is twofold. First, today’s low prices bear little relationship to the costs ARB projects for the kinds of efforts needed to achieve California’s ambitious 2030 climate target (ARB 2017a: 46). Second, tomorrow’s carbon prices could rise too quickly as oversupply conditions fade in the early 2020s.

To escape the constraints the current paradigm imposes, ARB may wish to consider a different approach to managing program costs. Rather than rely on allowance oversupply to keep costs low, ARB could evaluate other approaches. One option would be to re-orient its market design to carefully reduce allowance oversupply while containing price trajectories via lower price containment points and a graduated price ceiling level that starts at a lower initial price and increases more rapidly over time. This would require (1) a thoughtful study to evaluate market oversupply conditions and carefully address them via adjusting allowance budgets and/or banking rules (see Appendix 2), as well as (2) the establishment of price ceiling and/or price containment points at lower prices to contain costs within the Board’s discretionary authority under AB 398. Collectively, these reforms would better enable the Board to balance the trade-offs between program stringency and costs, relying on explicit controls to manage costs and increasing the transparency of the program’s implementation.

Appendix 1: ARB’s proposed post-2020 market design

ARB has proposed modifying the market design by shifting several quantities of allowances from the pre- and post-2020 allowance budgets into several so-called “allowance pools” (ARB 2018c). The summary figure below indicates how various quantities of allowances would be transferred from annual allowance budgets into standard quarterly auctions, two new price containment points, and a new set of accounts at the post-2020 market price ceiling:



1. Allowance banking and auctions
2. 1/3 of pre-2020 APCR sent to price ceiling
3. 2/3 of pre-2020 APCR allowances sent to price containment points
4. Post-2020 budget carve-outs
5. Post-2020 budget carve-outs sent to two price containment points and/or ceiling
6. Two price containment points
7. Price ceiling account
8. Unlimited, non-tradable “Price Ceiling Units”

Notes: All prices are given in units of 2015 USD, consistent with ARB’s new documents and the 2017 Scoping Plan. Figure not drawn to scale.

1. Allowance banking and auctions

Under current and proposed market regulations, regulated entities and third-party buyers can bank allowances for use in any future program years, subject only to corporate association-level holding limits (in 2018, up to 15.7M of current and each future year allowance vintage) (ARB 2017b). Allowances from the pre-2020 program budgets that are purchased at auction or freely allocated can be banked for post-2020 compliance purposes. Similarly, allowances from the post-2020 budgets that are purchased at auction or freely allocated can be banked for post-2020 compliance purposes. ARB has not proposed modifying the auction price floor, citing concerns about harmonizing WCI market design in Ontario and Québec; at the current schedule, the auction price floor would be \$25.16 per allowance in 2030 (2015 USD).

2. 1/3 of pre-2020 APCR sent to price ceiling

AB 398 requires ARB to create a new price ceiling at which unlimited new compliance instruments will be made available for purchase (see item #8, below). AB 398 also requires ARB to transfer 1/3 of the allowances in the pre-2020 Allowance Price Containment Reserve (APCR) at the end of 2017 into a separate price ceiling account (see item #7, below) that would be offered for sale before ARB issues unlimited new Price Ceiling Units (see item #8, below; these former APCR allowances come from the original program allowance budgets). At the end of 2017, there were 121.8M allowances in the APCR; thus, 1/3 of these allowances (40.6M) will be transferred into the post-2020 price ceiling account.

3. 2/3 of pre-2020 APCR sent to two price containment points

AB 398 requires ARB to send the remaining 2/3 of the allowances in the APCR at the end of 2020 to two new “price containment points” (see item #6, below). At the end of 2017, there were 121.8M allowances in the APCR; thus, 2/3 of these allowances (81.2M) will be transferred into the two price containment points (40.6M each).

4. Post-2020 budget carve-outs

ARB finalized post-2020 market regulations in 2017, after the passage of AB 398 but before making an effort to comply with the statute’s requirements. These regulations were approved by the Office of Administrative Law and therefore constitute current law. These regulations retained the

structure of the pre-2020 APCR but did not include a price ceiling, which is inconsistent with AB 398 and therefore requires reform. Accordingly, ARB is taking current regulations as the starting point for reforms and proposing changes relative to this baseline. In the 2017 regulations, ARB set aside 52.4M allowances for the APCR (see § 95871, Table 8-2).

ARB has now proposed increasing the size of the post-2020 APCR set-aside, reflecting the logic the Board employed in the pre-2020 market design period. In 2010, ARB had considered reserving 4% of the 2013-2020 allowance budgets for the APCR, mirroring the then-proposed 4% limit on offsets use. When ARB ultimately adopted an offsets limit of 8%, the Board also increased the APCR set-aside to 8%. Consistent with that approach, ARB now proposes to increase the post-2020 APCR set-aside by 2% of the allowance budgets for the period 2026-2030, reflecting the 6% offsets limit that applies in this period (6% being 2% higher than 4%). This would result in an addition 22.7M post-2020 allowances being transferred to the new price containment points (distributed equally from all post-2020 annual budgets, rather than from 2026-2030 budgets only).

Thus, ARB has proposed increasing the total post-2020 budget carve-out from 52.4M allowances (as specified in current regulations) by an additional 22.7M allowances, for a total of 75.1M allowances.

5. Post-2020 budget carve-outs to two price containment points and/or price ceiling

ARB is considering sending all of the allowances set aside for the APCR from the post-2020 allowance budgets (including proposed additions, see items #3 and #4, above) to one or both of the two new price containment points (see item #6, below) and/or the price ceiling account (see item #7, below). Including proposed additions to the post-2020 APCR above what is currently in ARB's official market regulations, the total number of allowances in question is 75.1M (see item #4, above).

6. Two price containment points

AB 398 delegates broad authority to ARB to design two new price containment points, which are essentially pools of allowances made available for purchase at specified prices.

ARB has proposed that the lower of these two price containment points be no lower than \$70 in 2021 (2015 USD). Under ARB's proposal, allowances

in the two price containment points would be made available for sale at an annual offering, as well as on a quarterly basis if the previous quarter's auction clears at or above 60% of the lower of the two price containment point reserve prices.

7. Price ceiling account

AB 398 delegates broad authority to ARB to design a new market price ceiling. Pursuant to statute, ARB must offer unlimited compliance instruments for sale at the price ceiling. The Board has proposed setting the 2030 price ceiling price no lower than \$81.90 per allowance and no higher than \$147 per allowance (both units in 2015 USD).

ARB can also offer other compliance instruments for sale at the price ceiling level. For example, AB 398 requires that 1/3 of the allowances in the APCR at the end of 2017 be transferred to the price ceiling account (40.6M, see item #2 above). In addition, under current regulations, allowances that remain unsold at auction after 24 months are automatically transferred to the APCR. AB 398 requires that ARB to transfer any allowances remaining in the APCR at the end of 2020 into the price ceiling.

Because current market regulations restrict the rate at which previously unsold allowances can be re-introduced, at least some of the previously unsold allowances will remain unsold for 24 months, be transferred into the APCR, and eventually removed to the post-2020 price ceiling account. Even if all allowances re-introduced at auction sell, approximately 40M will ultimately be transferred to the post-2020 price ceiling (Busch 2017).

8. Unlimited, non-tradable "Price Ceiling Units"

ARB has proposed distinguishing the unlimited compliance instruments it must offer at the price ceiling from "normal" allowances that are part of the program's overall allowance budget. ARB proposes calling the new unlimited instruments "Price Ceiling Units" and making them subject to different rules. The Price Ceiling Units would be made available for purchase at an annual event that is separate from the quarterly auctions. The new Price Ceiling Units would not be tradable, but would instead be available for purchase in a manner that allows regulated entities to close any gaps in their annual compliance obligations in a timely manner.

AB 398 requires the Board to spend all revenue raised from sales of additional compliance instruments at the price ceiling on additional reductions

of greenhouse gases—an environmental integrity provision (see Cullenward et al. 2018). Under ARB’s proposal, only these Price Ceiling Units would be subject to AB 398’s environmental integrity provision. All other, “normal” allowances offered for sale at the price ceiling (see item #7, above) would not be subject to this requirement.

Appendix 2: Overallocation / oversupply study needs

AB 398 requires ARB to evaluate and address as appropriate “concerns related to [allowance] overallocation” (Cal. Health & Safety Code § 38562(c)(2)(D)). In order to properly evaluate market overallocation / oversupply, a study would need to consider several important factors:

- The gap between pre-2020 allowance budgets and pre-2020 GHG emissions, both in terms of observed (through 2016) and projected (2017-2020) emissions;
- The role carbon pricing may have played in the difference between allowance budgets and actual emissions, including anticipatory mitigation undertaken by covered entities;
- An estimate of the extent to which extra allowances in the pre-2020 allowance budgets are being banked in private and government accounts, and a mechanism for tracking banking behavior on an ongoing basis;
- The supply of carbon offset credits through 2020 and their impact on the size of allowance banking;
- The balance of compliance instrument supply and demand across linked programs in California, Québec, and Ontario;
- The extent to which the delayed re-introduction of previously unsold allowances from undersubscribed auctions will result in the de facto retirement of some of these allowances; and,
- The carry-forward of pre-2020 APCR allowances into post-2020 price containment points.

We believe the existing literature provides a helpful start to answering many of these issues and are confident that further study could produce a thoroughly vetted analysis with broad stakeholder input to inform ARB’s planning. We urge ARB to take seriously the need to design a cap-and-trade program that addresses the program’s current challenges and to conduct a public estimate of market oversupply conditions to inform the Board’s options.

References

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About Near Zero

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Interpreting AB 398's carbon offsets limits

AB 398 requires the California Air Resources Board (ARB) to incorporate new limits on the use of carbon offsets in its post-2020 cap-and-trade market design. ARB has released its initial thinking on how to implement these new statutory provisions. We review two key issues here.

First, AB 398 requires ARB to limit the use of offsets to 4% and 6% of an entity's emissions in the periods 2021-25 and 2026-30, respectively. ARB has proposed a novel interpretation of how to calculate the timing of applicable restrictions such that the higher limit would apply to most emissions that take place in calendar years 2024 and 2025, in addition to those that occur in 2026 through 2030. The proposed interpretation would increase the maximum quantity of offset credits that can be used by a total of approximately 8.5 million instruments, relative to a scenario in which AB 398's limits are applied to calendar-year emissions.

Second, AB 398 further limits the total number of offset credits that covered entities can use from projects that do not generate a "direct environmental benefit" (or "DEB") to air or water quality in California. We explore under what conditions an offset project produces a DEB. ARB has proposed a project-by-project evaluation but has not yet offered any bright-line rules to limit acceptable arguments for establishing a DEB. While a project-by-project approach could make sense, we argue that ARB's DEB assessment should exclude greenhouse gas (GHG) emissions from consideration because carbon offsets create no net reduction in GHGs and therefore no net climate benefits that could be said to constitute a DEB to California air or water quality.

Background: AB 398 sets new offset limits

Under California's original climate law, AB 32, the legislature gave ARB broad discretion to determine whether and to what extent covered entities may use carbon offsets to satisfy their compliance obligation under the state's cap-and-trade program. For the period 2013 through the end

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of 2020, ARB eventually selected a limit that enables covered entities to submit ARB-approved carbon offset credits for up to 8% of their covered emissions.¹

Although 8% might seem small, the original offsets limit is actually quite large compared to the emission reductions expected from the current phase of the cap-and-trade program. Dr. Barbara Haya at UC Berkeley calculated that this limit—which enables covered entities to use more than 200 million offset credits through 2020—could, if fully exploited, generate 100% of net reductions expected under the cap-and-trade program through 2020 (Haya 2013). In the market’s first compliance period (2013-14), however, covered entities submitted allowances equal to 4.4% of their covered emissions in the market’s first compliance period—just over half of the limit.² That share rose to 7.9% and 8.3% of compliance obligations submitted in 2015 and 2016, respectively, although it is not possible to say whether offsets usage is changing relative to the first compliance period because only 30% of the total compliance obligations for 2015 and 2016 have come due.² Data on the share for the full second compliance period (2015-17) is not yet available, as the compliance obligation will come due later this year.³

In contrast to the broad discretion ARB enjoys with respect to carbon offsets under AB 32, AB 398 imposes new offset limits that apply to the state’s post-2020 market design:

(I) From January 1, 2021, to December 31, 2025, inclusive, a total of 4 percent of a covered entity’s compliance obligation may be met by surrendering offset credits of which no more than one-half may be sourced from projects that do not provide direct environmental benefits in state.

(II) From January 1, 2026, to December 31, 2030, inclusive, a total of 6 percent of a covered entity’s compliance obligation may be met by surrendering offset credits of which no more than one-half may be sourced from projects that do not provide direct environmental benefits in the state.⁴

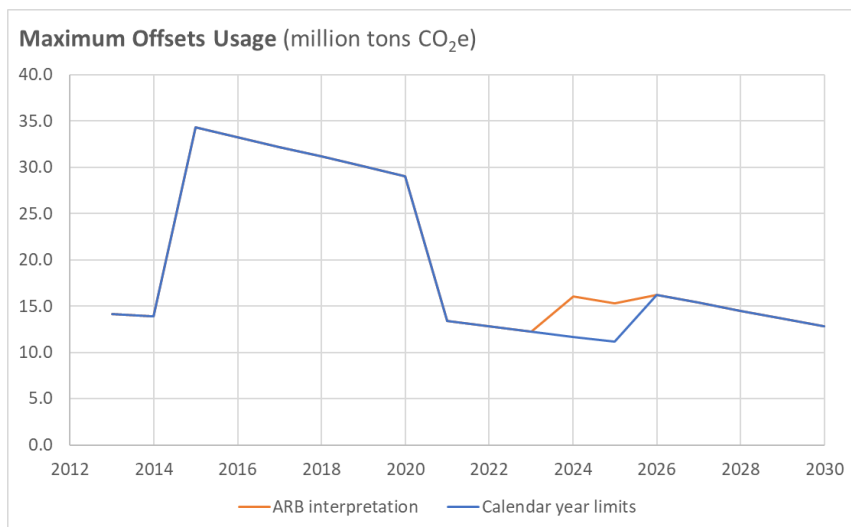
The Board’s attention has turned to developing regulations that implement AB 398’s requirements, including the new offset limits.

A permissive interpretation of AB 398's total offset limits

ARB has proposed an initial interpretation of AB 398's new offset limits that increases the total number of carbon offsets that can be surrendered by covered entities to account for their emissions in 2024 and 2025, compared to an interpretation in which the AB 398 offset limits are directly applied to calendar-year emissions (ARB 2018a: slide 25).

The proposal is based on the way ARB requires covered entities to submit compliance instruments within three-year compliance periods. For each of the first two years of a compliance period, ARB requires covered entities to submit compliance instruments to account for at least 30% of their annual emissions obligation.³ In the third and final year, however, covered entities must submit compliance instruments to cover any remaining emissions from those previous years (up to 70% of each year's total) as well as all of the emissions in the final year of the compliance period.³ Thus, the compliance obligation that comes due for the third year of a compliance period can represent a substantial majority of a covered entity's emissions over the entire three-year compliance period.

This distinction matters because the market's fifth compliance period spans 2024-26, during which time the carbon offsets limits under AB 398 increase from 4% to 6%. Under ARB's proposal the higher limit would apply to all emissions in 2026, as well as up to 70% of emissions in both 2024 and 2025 that covered entities could elect to submit to cover their 2026 compliance obligations.



SOURCE: NEAR ZERO CALCULATIONS, BASED ON ARB (2018a)

In the figure above, the dark blue line (“Calendar year limits”) represents the annual offsets limits that would apply if ARB interpreted the AB 398 limits literally, based on the calendar year of emissions. The orange line (“ARB interpretation”) shows the limits that ARB staff proposed in its March 2018 preliminary discussion draft regulations. For simplicity, both scenarios assume that covered emissions will be equal to annual program budgets for each year plus the maximum number of permissible offsets. Other outcomes would be possible if covered entities bank allowances from year to year. If covered entities’ GHG emissions are higher than program budgets in 2024 and 2025 due to banking of previously unused allowances, then maximum offsets usage would be higher; if covered entities’ GHG emissions are lower than program budgets for 2024 and 2025, then maximum offsets usage would be lower.

	2023	2024	2025	2026	2027
Calendar Year Limits	4%	4%	4%	6%	6%
ARB Interpretation	4%	5.4%	5.4%	6%	6%

SOURCE: NEAR ZERO CALCULATIONS, BASED ON ARB (2018a)

Expressed numerically, the effect of ARB’s proposed interpretation is to increase the effective carbon offsets limit for emissions that occur in 2024 and 2025 from 4% to 5.4%. In total, ARB’s interpretation would allow covered entities to submit approximately 8.5 million more offset credits relative to an interpretation that applies the limits in AB 398 to the emissions by calendar year.

What constitutes a “direct environmental benefit”?

AB 398 not only sets a limit on the total number of carbon offset credits that can be surrendered by covered entities in the post-2020 market period, but also on the types of offsets that qualify. Beginning in 2021, additional restrictions apply to projects that do not provide “direct environmental benefits” (or “DEB”) in California. No more than half the total number of allowable offsets may come from such projects. AB 398 defines a DEB as:

[T]he reduction or avoidance of emissions of any air pollutant in the state or the reduction or avoidance of any pollutant that could have an adverse impact on waters of the state.⁴

In its preliminary discussion draft regulations, ARB has proposed a bifurcated approach to interpreting this statutory requirement.

First, ARB has proposed a set of bright-line rules that, if met, would automatically deem an offset project as producing a DEB. For example, a project located in California that reduces air pollution would qualify; so too would any project that reduces water pollution and is located either in California or adjacent to a body of water that flows into California (ARB 2018: 17-19). If any of these bright-line rules are met, ARB would automatically deem the project to provide a DEB.

Second, if ARB does not deem a project to provide a DEB based on these bright-line rules, ARB staff have proposed a process whereby projects may make individualized applications to ARB to demonstrate their case. ARB has invited comment on what factors, data, and analysis should be considered in this process.

ARB's bifurcated approach offers important advantages, in that it both outlines bright-line rules for inclusion and contemplates a bottom-up process to provide opportunities for projects to justify direct environmental benefits to California air or water quality. However, ARB has not provided any bright-line rules that would foreclose unacceptable arguments for establishing a DEB—that is, ARB has not proposed any limits on arguments that would qualify a project as providing a DEB. As a result, there are several important open questions that will need careful consideration to implement the legislative intent of AB 398 while also ensuring that ARB's regulatory implementation respects constitutional standards that apply to state regulation of interstate commerce.

The most challenging issue concerns the role of GHG emissions. ARB's preliminary discussion draft regulations suggest that ARB believes “a GHG reduction anywhere is a benefit everywhere” (ARB 2018b: 17)—a position the state and its allies successfully took in a landmark dormant commerce challenge to California's Low Carbon Fuel Standard.⁴ Furthermore, in response to questions at its March 2018 workshop, ARB staff indicated that they believe GHGs are included in the operative phrase “any air pollutant” used in AB 398's DEB definition, suggesting

that the Board may be open to offset projects demonstrating a DEB by demonstrating a reduction in GHG emissions.

However, recognizing reduced or avoided project-level GHG emissions as the basis for a DEB would raise significant concerns because offset projects by definition produce *zero net* GHG reductions. In return for gross reductions or avoided emissions of GHGs as measured at the offset project, ARB awards an equal number of offset credits to the project developer. Project developers sell these credits to covered entities, which use them to emit additional GHGs equal in quantity to the offset project's reduced or avoided GHG emissions. Thus, there is no net reduction in GHGs attributable to any offset project.

Even though there is a marginal but incontrovertible climate benefit everywhere when GHGs are reduced anywhere, that benefit accrues only when there is a *net* reduction in GHGs. By definition, an offset project produces no net GHG reductions because the gross reduction measured at the project level is counteracted by an increase in GHG emissions by covered entities that acquire the project's offset credits.

A more complicated example: ozone depleting substances

Although no offset project can claim net GHG reductions when its credits are used by covered entities to emit more GHGs, the Ozone-Depleting Substances (ODS) Protocol raises several additional complications.

The ODS Protocol credits the destruction of ODS that would have eventually leaked out of devices such as older air conditioning and refrigeration units. ODS projects take ODS-containing equipment—including some equipment collected in California—and ship this equipment to an out-of-state facility for controlled gas destruction. Does the out-of-state destruction of ODS-containing equipment that was previously located in California constitute a “direct environmental benefit” to California?

To evaluate this question, we consider an ODS offset project that avoids 1 metric ton of carbon dioxide equivalent (tCO₂e) from ODS-containing equipment that was originally located in California but was subsequently shipped to an out-of-state facility for destruction. As a result of the offset project, in-state ODS emissions are reduced by 1 tCO₂e. At the same time, however, an in-state entity will be able to use the resulting offset credit to increase its CO₂ emissions by 1 tCO₂e. Thus, as with other off-

set projects, there is a gross GHG reduction at the project level, but no net change in GHGs on a global level.

The ODS example illustrates additional challenges in interpreting what constitutes a direct environmental benefit under AB 398 because ODS gases are both GHGs and gases that contribute to the destruction of the ozone layer. Although there is no net climate benefit to ODS destruction projects that earn offset credits, the avoidance of ODS emissions that would have occurred in California could be interpreted as an “avoidance of emissions of any air pollutant in the state.” Furthermore, ODS destruction arguably provides a net global benefit to reduced ozone layer destruction that partially accrues to California—although the benefit would more accurately be described as an indirect environmental benefit, rather than a direct environmental benefit to state air or water quality.

	Before offset (*)	After offset	Net change
In-state ODS (tCO ₂ e)	10	9	-1
In-state GHGs (tCO ₂ e)	100	101	+1
Total GHGs (tCO ₂ e)	110	110	0
In-state co-pollutants	Lower	Higher	Higher
Indirect ozone layer impacts	Higher	Lower	Lower

* VALUE IS ARBITRARY; NET CHANGE IS NOT

As this example illustrates:

- Like all offset projects, an ODS offset project produces a gross GHG reduction but zero net GHG benefits. As a result, there is no net climate benefit to California air or water quality.
- Like all offset projects, ODS projects can also lead to higher net in-state co-pollutants if covered entities that emit GHGs and co-pollutants increase emissions of both local and global air pollutants relative to a scenario in which no ODS offset credit is available.

- Nevertheless, ODS credits awarded for destruction of ODS-containing equipment in California—which would have eventually emitted ODS in California—could plausibly be said to involve the “reduction or avoidance of any air pollutant in the state.”⁴
- ODS projects also provide a net reduction in impacts to the ozone layer, although the corresponding environmental benefit to California air or water quality would better be described as indirect—not a direct environmental benefit to California air or water quality.

Conclusions

In this note we evaluated two key issues related to implementing AB 398’s new offset requirements.

First, ARB must implement AB 398’s overall limits on offset usage. We show that ARB’s proposed interpretation of AB 398’s limits increases the quantity of offset credits that can be used in 2024 and 2025 by a total of approximately 8.5 million, relative to a scenario in which the statutory limits apply to calendar year emissions and assuming that emissions in those years are equal to the annual program budget plus the maximum allowable offsets usage. Under ARB’s proposed interpretation, covered entities could submit offset credits equal to 5.4% of their 2024 and 2025 emissions, rather than 4%.

Second, ARB must determine what constitutes a “direct environmental benefit” to California air or water quality. We show that if ARB interprets the “reduction or avoidance of any emissions of any air pollutant” by looking only at the gross reduction of greenhouse gas emissions from offset projects, local air pollution could actually increase without producing any climate benefits. We recommend that ARB be explicit and consistent in its analysis of the gross vs. net impacts on local environmental pollution, greenhouse gas emissions, and any other environmental issues (such as reduced ozone layer depletion). Once emissions from offset credit use are taken into account, no offset projects reduce net greenhouse gas emissions and therefore no offset projects provide net climate benefits to California air or water quality—whether direct or indirect.

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Notes

1. Cal. Code Regs., tit. 19, § 95854(b).
2. Compliance obligations for 2015 and 2016 represent 30% of emissions by covered entities in the respective year. Compliance reports are available at <https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>.
3. Cal. Code Regs., tit. 19, §§ 95855–95856.
4. Cal. Health & Safety Code § 38562(c)(2)(E) (as added by AB 398).
5. Rocky Mountain Farmers Union v. Corey, 730 F.3d 1070 (9th Cir. 2013). Full disclosure: Dr. Cullenward represented environmental scientists who made this argument in support of ARB's position in the case.

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