White Paper

Allowance Supply and Demand in the California Cap-and-Trade Program

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I. EXECUTIVE SUMMARY

This white paper evaluates the extent to which the projected allowance supply and demand in the California Air Resources Board's ("**ARB**") Cap-and-Trade Program[1] through 2030 could threaten California's objectives for regulating greenhouse gas emissions in accordance with California law, including Assembly Bill ("**AB**") 32, Senate Bill ("**SB**") 32, and AB 398. The paper takes as its cue AB 398, which was adopted in July 2018 and directs ARB to "[e]valuate and address concerns related to overallocation in [ARB's] determination of the number of available allowances for years 2021 to 2030, inclusive, as appropriate."

For the reasons discussed more fully below in Sections II and III, this paper reaches the following conclusions:

- **ARB must balance its efforts to achieve the 2030 emissions target with other State policies.** Many who have considered the oversupply issue have not given any weight to other, in some ways competing, legal requirements applicable to ARB, including the mandates set forth under California law to (1) achieve the maximum technologically feasible emission reductions in a manner that is both cost-effective and cost-minimizing, (2) incentivize early reductions, and (3) fairly allocate allowances. The Cap-and-Trade Program as designed by ARB represents an effective, fair and reasonable balancing of these many requirements. Efforts to evaluate oversupply must acknowledge that the 2030 emissions target does not apply in isolation and, to the contrary, is but one element among multiple legal requirements that make up California's climate change program.

- **Allowance banking is an important market design feature that promotes the State's climate regulation goals.** Debates about oversupply inevitably involve debates about allowance banking, since the perceived concern about oversupply arises from a fear that allowance banking allows entities to avoid reducing emissions. Allowance banking, however, promotes early investment in emissions abatement measures and plays an important cost containment role, without compromising environmental integrity.

- **Removing allowances from the market to correct "oversupply" would be inconsistent with several of California's statutory requirements.** Under AB 32, the Cap-and-Trade Program must meet ***both*** environmental and economic tests. AB 398 further reflects these dual considerations by, among other mechanisms, introducing price limitations to ensure that the Program's

[1] 17 Cal. Code Regs. §95800, *et seq*.

environmental targets are achieved at reasonable cost. As other commenters have noted, removing allowances from the market would merely increase the price of remaining allowances without necessarily guaranteeing any quantity of emission reductions nor the implementation of long term measures to decarbonize the economy. Thus, removing allowances is neither required by the law's environmental direction nor consistent with its cost-effectiveness and other fairness requirements.

- **There is inconclusive evidence of a current oversupply.** While there is speculation that oversupply could become a problem in the future, there is no evidence that the Cap-and-Trade Program is currently "oversupplied" in any way that impacts its environmental integrity. Removing credits from the market prematurely is unnecessary and could decrease market stability by creating additional uncertainty for market participants. ARB need not act prematurely because it has the ability to correct oversupply in the future should it actually develop to a degree that ARB determines would threaten program objectives.

- **Existing market design features prevent any oversupply from harming the program.** The auction reserve price already protects the Cap-and-Trade Program from the worst effects of oversupply, rendering additional, drastic action unnecessary.

II. CALIFORNIA'S CLIMATE POLICY OBJECTIVES

ARB's determination of whether there is overallocation in the Cap-and-Trade Program will partially depend on how ARB defines the term "overallocation." The term "overallocation" (or "oversupply" as commenters have referred to it interchangeably) should be interpreted as a condition in which the long-term supply of allowances so significantly exceeds demand ***that it materially compromises California's programmatic climate goals***. Much of the debate about oversupply has taken place in the context of a more narrow focus on SB 32's emissions target for a single year (2030), to the exclusion of other statutory mandates and state objectives that apply to ARB. To properly frame the discussion, this section provides an overview of the key State objectives underpinning the Cap-and-Trade Program.

A. California has established GHG Emissions Targets for 2020, 2030 and 2050

Governor Schwarzenegger established a greenhouse gas reduction target of 80 percent below 1990 levels by 2050 by Executive Order in 2005.[2] In 2006, AB 32 established the 1990 statewide greenhouse gas emissions level as a target to be achieved by 2020. But AB 32 does not elevate 2020 actual emissions as an end of itself; instead it refers to the 2020 limit in the broader context of ongoing reductions, i.e., as a tool to "be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020."[3] The bill also required ARB to adopt regulations—and authorized adoption of the Cap-and-Trade Program—to achieve

[2] Executive Order S-03-05 (June 1, 2005).

[3] AB 32 §38560.5(c), 38562(a).

emissions reductions "in furtherance of achieving the statewide greenhouse gas emissions limit."[4] In 2016, the Legislature adopted SB 32, requiring that ARB "shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below [1990 levels] no later than December 31, 2030," a significantly steeper reduction than in prior years.[5]

Although ARB must develop regulations to achieve the 2020 and 2030 targets, as a matter of overall program design ARB clearly has the flexibility to evaluate compliance with those targets without focusing myopically on specific emissions levels in any single year. AB 398 permits ARB to evaluate the Cap-and-Trade Program's emission reductions "in the aggregate" rather than focusing on reductions achieved in any specific year.[6] And, in 2015, Governor Brown issued an Executive Order establishing what eventually became SB 32's 2030 target, which he characterized as an "interim" target that served the purpose of helping California along to its 2050 goal."[7] As a California appellate court interpreting AB 32 noted in *Association of Irritated Residents v. Air Resources Board,* "the [2020 limit] is but a step towards achieving a longer-term climate goal," noting approvingly that "[ARB] sought to define in the scoping plan measures that will permit the state to reach goals that are attainable by 2020, as a step toward the ultimate objective by 2050."[8] The same logic would apply to the 2030 goal as well.

B. ARB Must Design and Implement Cost-Effective Emissions Reduction Programs

AB 32 requires ARB to achieve greenhouse gas emission reductions in a manner that is both cost-effective and cost-minimizing. The requirement that GHG reductions be achieved in a cost-effective manner is reiterated ten times in different sections of the bill, including in reference to the adoption of rules and regulations, approval of the scoping plan, and the adoption of the Cap-and-Trade Program.[9] AB 398, adopted in 2017, reiterates the importance of cost effectiveness particularly with regard to distribution of emissions allowances, requiring ARB to "[d]esign the regulations, including distribution of emissions allowances…in a manner that is equitable [and] seeks to minimize costs and maximize the total benefits to California…."[10] This demonstrates that the cost-effectiveness objective is not a mere afterthought or subsidiary policy objective in California climate law; to the contrary, it is a core principle.

C. ARB Must Achieve the Maximum Technologically Feasible Emissions Reductions

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[4] AB 32 §§38550, 38560, 38562(c).

[5] SB 32 §38566.

[6] AB 398 §38562(c)(2).

[7] Executive Order B-30-15 (April 29, 2015).

[8] *Association of Irritated Residents v. Air Resources Board,* 206 Cal.App.4th 1487, 1496 (2012).

[9] AB 32 §§ 38560, 38561(a), 38562(c).

[10] AB 398 §38562(b)(1).

Paired with the requirement that ARB achieve reductions in a cost-effective and cost-minimizing manner is the requirement that ARB achieve the maximum technologically feasible reductions. AB 32 reiterates five times that ARB must achieve the "maximum technologically feasible and cost-effective" greenhouse gas emissions reductions in different contexts.

The Legislature's direction to ARB in AB 32 to prepare the scoping plan to achieve the maximum technologically feasible and cost-effective reductions stands alone. It is not conditional on achievement of the cap.[11] This independent direction is not changed in subsequent legislation. So, for example, although, in AB 398, the Legislature added a requirement that ARB update the Scoping Plan by 2018 to achieve SB 32's 2030 target (much as it had previously targeted the 2020 limit), the Legislature did not alter the central program design principles of ***maximum environmental benefit at minimum cost*** that it set forth in AB32.

D. ARB Must Treat Regulated Entities Fairly

California's climate legislation establishes several additional policy goals, including (1) encouraging early action to reduce emissions;[12] (2) ensuring that entities that have voluntarily reduced their emissions receive "appropriate credit" for early voluntary reductions; [13] and (3) minimizing the administrative burden of compliance. [14]

III. ANALYSIS

Some commenters have suggested that the 2021-2030 Cap-and-Trade Program will be oversupplied, meaning that they predict that compliance entities will retire extra allowances to satisfy emission reduction targets, rather than reducing their own emissions.[15] These commenters have suggested that reducing the number of allowances in the program may be an effective way to correct this "oversupply." This section of the paper considers whether removing allowances from the program appropriately furthers the California climate policy objectives described above.

A. Allowance Banking is a Legitimate Market Design Feature that Advances California's Climate Objectives

The concern with "oversupply" is in many ways a concern about the legitimacy of "banking." "Banking" refers to covered entities' ability under the regulations to hold onto

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[11] AB 32 §38561(a), (b).

[12] AB 398 §38562(b)(1).

[13] AB 398 §38562(b)(3).

[14] AB 398 §38562(b)(7).

[15] *See, e.g.*, Chris Busch, "Oversupply Grows in the Western Climate Initiative Carbon Market," Energy Innovation: Policy & Technology LLC (December 2017); Legislative Analyst's Office "Cap-and-Trade Extension: Issues for Legislative Oversight" (December 12, 2017); Daniel Cullenward, "Critical issues in post-2020 Cap-and-Trade market design: Hot air and carbon offsets," Policy Brief (June 23, 2017).

allowances received or purchased in one compliance period for use in future compliance periods. Commenters have expressed concern that entities can avoid reducing emissions in the future by banking allowances today and retiring them as the cap declines.

ARB designed the program to allow banking of emission reductions for future use, recognizing that this design feature provides an incentive for early action to reduce emissions.[16] In allowing banking, ARB was applying the lessons of the EU, where the first phase of the EU-ETS saw a collapse in allowance prices because of the inability of participants to bank allowances. ARB's approach was consistent with the recommendations of the expert panel assembled through the California Climate Change Center at UC Berkeley, which recommended allowing the use of unlimited banking in order to "reduce[] the overall cost of emission reductions and help[] to avoid short-run volatility in allowance prices."[17] As Environmental Defense Fund has explained, a cap-and-trade program that allows banking "increases the pool of available capital to make reductions, encourages companies to cut pollution faster, and rewards innovation."[18]

The expert economists' panel further noted that banking achieves economic flexibility without sacrificing environmental integrity:

> "[banking] has little effect on the pace of global warming. A key component of how GHG contribute to global warming is the long time that GHG are resident in the atmosphere. It depends very little on exactly when emissions occur…[h]ence, the role of banking is not environmental but primarily economic."[19]

By reducing program costs without sacrificing environmental integrity, the inclusion of allowance banking in the program fulfills the Legislature's mandate to achieve emissions reductions cost effectively, promote early reductions, and minimize administrative burden.

B. The Cap-and-Trade Program can Achieve Aggregate Emission Reductions Over Time

As economists generally recognize, a multiyear program that allows banking will not ensure compliance with a specific annual cap in a specific year, by definition. At least one commenter has characterized this point as potentially unacceptable:

> Although there are legitimate debates about whether state climate policies should focus primarily on cumulative or annual emissions

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[16] 2010 ISOR at ES-9

[17] Dallas Burtraw et. al., "Lessons for a cap-and-trade program," The California Climate Change Center at UC Berkeley at 5-38.

[18] Nathaniel Keohane, "How cap and trade works," Environmental Defense Fund, *available at* https://www.edf.org/climate/how-cap-and-trade-works (last accessed February 19, 2018).

[19] Burtraw at 5-16.

> targets, the Legislature has established an annual 2030 GHG target, and banking creates a risk of not meeting that goal.[20]

The author appears to ignore the fact that AB 32 and AB 398 both expressly authorize ARB to design the Cap-and-Trade Program to achieve "the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions, ***in the aggregate***."[21] As ARB explained in its initial rulemaking for the program, in a program that allows allowance banking, "program stringency is best evaluated by considering all years" of the program rather than just the final year of the program."[22]

C. Removing Allowances From the Market would Thwart California's Climate Policies and Unfairly Penalize Regulated Entities

The effect of removing allowances from the market now to address a perceived "oversupply" would be to reverse course on ARB's prior policy decision to allow banking—a drastic course of action. Rather than encouraging early action to reduce greenhouse gas emissions, as required by statute, removing allowances would punish market participants who made early reductions by tightening the market and creating a risk of higher future compliance costs. (As one commenter has noted, removing allowances from the program would significantly increase the likelihood that the price of allowances hits the program cap.)[23] The action would also violate the statutory mandate to distribute emissions allowances "in a manner that is equitable." It is simply unfair to set market expectations that influence purchasing decisions and then reverse the rules that formed the basis of those decisions.

Removing allowances may not ultimately guarantee a certain quantity of emissions in the program, but it would make it more likely that allowance prices would hit the price cap. This outcome would be difficult to square with ARB's statutory obligations to achieve cost-effective reductions, particularly since there is no guarantee that pushing the price to the ceiling more quickly will keep emissions below the cap at any given point in time.

D. There is Insufficient Evidence to Conclude that the Market is Oversupplied

At the very least, given the potentially negative consequences of reversing its policy on banking and removing allowances, ARB should exercise caution in evaluating "overallocation" claims. ARB should only remove allowances from the program if it appears reasonably certain that the degree of overallocation will thwart the goals of the program. At present, in 2018, there remains significant uncertainty on this point.

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[20] Chris Busch, "Oversupply Grows in the Western Climate Initiative Carbon Market," Energy Innovation: Policy & Technology LLC (December 2017).

[21] AB 398 §38562(c)(2) (emphasis added).

[22] 2010 FSOR at 165.

[23] Severin Borenstein and Jim Bushnell, "California's Carbon Cap is Not in Jeopardy, Because It's Not Really a Cap," Energy Institute at Haas (January 3, 2018).

1. Actual 2030 emissions will likely be different than projected 2030 emissions

There is a great deal of uncertainty associated with the supply and demand projections that currently inform oversupply discussions. Technological changes, economic performance, and other factors will likely have dramatic and currently undiscernible effects on actual emissions. The Brattle Group emphasized this point in their recent paper on supply and demand in the Cap-and-Trade Program, adopting a variety of assumptions to develop wide-ranging allowance price forecasts for 2030.[24] There is no need for ARB to act on these assumptions now, when there are years to go before we know whether supply and demand projections prove true. ARB retains its authority over the program going forward, and can act if and when necessary to correct issues as they arise.

Moreover, there have been several efforts to quantify anticipated emission reductions from the Cap-and-Trade Program indicating that the market is *not* problematically oversupplied.

- A paper published by the University of California Energy Institute ("**UCEI**") paper predicts that demand will balance supply sufficiently to accomplish robust carbon pricing. The paper predicts a $45.53 "probability-weighted expected price" in 2030 for a market with a $60 hard price cap and two speed bumps, and predicts a 16% chance of hitting a $60 price ceiling in 2030.[25] UCEI's projection of a price point well above the floor price is arguably inconsistent with the theory that the market is oversupplied.

- Similarly, the Brattle Group published a paper predicting allowance price in 2030 ranging from $37 per ton to $80 per ton, depending on a range of regulatory and technological assumptions.[26]

2. Entities may not decide to bank as many allowances as possible

Commenters arguing that oversupply threatens the Cap-and-Trade Program generally assume that covered entities will purchase all available allowances and bank them for future

[24] Yingxia Yang et. al., "The Future of Cap-and-Trade Program in California: Will Low GHG Prices Last Forever?" The Brattle Group (December 2017) at 23.

[25] *See* Borenstein, S., Bushnell, J. and Wolak, F., "California's Cap-and-Trade Market Through 2030: A Preliminary Supply/Demand Analysis," Energy Institute at Haas (July 2017).

[26] Yingxia Yang et. al., "The Future of Cap-and-Trade Program in California: Will Low GHG Prices Last Forever?" The Brattle Group (December 2017) at 23.

use.[27] This assumption may prove false, however. As ARB has noted, "[m]any businesses in the Program cannot spend significant capital to buy and hold allowances."[28]

ARB's observation comports with economic realities, particularly the time value of money ("**TVM**"), which may make excessive allowance banking undesirable. TVM is the concept that a particular sum of money in the present is worth more than the same amount in the future, due to its potential earning capacity. Looking farther into the future, the same quantity of capital is of ever decreasing value because of compounding lost returns on investment. The longer the time gap, the greater the difference in TVM.

In the short term, for example over the course of one or two years, TVM has relatively little impact on financial decision-making. In the context of the Cap-and-Trade Program, entities may sensibly decide to purchase allowances for use in near-future compliance cycles because the advantage of flexibility outweighs the modest difference in TVM. However, over a longer term, the relative benefits of flexibility may steadily decline. Holding allowances for five or ten years, as would be required if entities were to bank allowances from the pre-2020 program for compliance use in 2025 or 2030, could represent a significant loss of potential earnings.

3. <u>The Cap-and-Trade Program is unlikely to end in 2030</u>

The concern about stockpiling allowances follows directly from the assumption that the program ends in 2030. If the program ends in 2030, entities may "cash in" all of the allowances they have held up to that date because they will have no use for them afterwards. If the program continues past 2030, however, entities may wish to continue banking allowances to protect against future volatility, or may wish to continue banking allowances for other reasons. In that case, surrendering all of an entity's banked allowances to hit an interim 2030 target will turn out to have been a poor compliance strategy. Entities that have opted to invest in stockpiling allowances early rather than investing in sustainable emissions reductions strategies may face skyrocketing compliance costs once they exhaust their reserve of banked allowances. Other entities that have reduced their emissions will have a smaller allowance purchasing requirement going forward, but entities that have relied on stockpiling would likely continue to have high emissions and have no choice but to purchase allowances at 2031 prices.

It would be imprudent to decide today, in 2018, to upend sound program design features on the unjustified assumption that the program will end in 2030. In fact, there is every reason to believe at this point that the program will continue. Executive Order S-03-05 establishes an ambitious GHG reduction target of 80 percent below 1990 levels by 2050. ARB has treated both its 2020 AB 32 target and its 2030 SB 32 target as steps towards that ultimate goal rather than as isolated goals in themselves. ARB's current Cap-and-Trade Program regulations establish

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[27] *See, e.g.*, Busch at 6 ("Because unused allowances…can be saved and used later, this oversupply will very likely be banked").

[28] California Air Resources Board, "Joint Oversight Hearing of the Senate Environmental Committee and Senate Budget and Fiscal Review Subcommittee No. 2 on Resources, Environmental Protection, Energy and Transportation: California Air Resources Board-Responses to Questions" (January 17, 2018).

annual budget years for the program through 2050. Likewise, the recent Scoping Plan update frames the 2030 goal as a stepping stone towards the 2050 goal.

E. Existing Market Safeguards Protect against any Negative Effects of Perceived Oversupply

The Auction Reserve Price[29] protects the program's integrity even if supply exceeds demand by continuing to send a consistent price signal to market participants. Other programs, such as the European Union Emissions Trading System ("**EU ETS**") and the Regional Greenhouse Gas Initiative ("**RGGI**") in the northeastern portions of the United States, have experienced oversupply issues. In the case of the EU ETS, the program lacked a price floor. In the face of oversupply, this led to considerable market volatility and an eventual collapse of the price of allowances to near zero.[30] The EU ETS debacle inspired the use of a price floor in the California Cap-and-Trade Program. The RGGI has a price floor, but it is considerably lower than that of the California Cap-and-Trade Program. The RGGI price floor is currently set at $2.15, while the California Cap-and-Trade price floor is $14.53.[31]

[29] 17 Cal. Code Regs. §95911(c).

[30] "RIP, ETS?" *The Economist* (April 20, 2013) available at https://www.economist.com/news/finance-and-economics/21576388-failure-reform-europes-carbon-market-will-reverberate-round-world-ets.

[31] RGGI Auction Notice for CO2 Allowance Auction 38 on December 6, 2017 (October 10, 2017), available at https://www.rggi.org/docs/Auctions/38/Auction_Notice_Oct_10_2017.pdf; ARB 2017 Annual Auction Reserve Price Notice (December 1, 2016), available at https://www.arb.ca.gov/cc/capandtrade/auction/2017_annual_reserve_price_notice_joint_auction.pdf.