

October 22, 2018

California Air Resources Board VIA ELECTRONIC SUBMISSION

Subject: Comments on the September 4, 2018 Proposed Amendments to California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation

The Institute for Policy Integrity at New York University School of Law (Policy Integrity)¹ respectfully submits the following comments to the California Air Resources Board (ARB) on its proposed regulations (Proposed Amendments) implementing Assembly Bill 398 (AB 398), which extends and alters the California cap-and-trade program for greenhouse gases.² Policy Integrity is a nonpartisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

In further developing its Proposed Amendments, ARB should:

- Take into account the social cost of carbon (SC-CO₂) in setting both the price ceiling and the Auction Reserve Price (price floor);
- More thoroughly explain how ARB's concerns about leakage are reflected in the proposed pricing structure;
- Preferentially allocate unsold allowances to price tiers that fully account for the marginal damage caused by each ton of carbon dioxide;
- Consider adopting Compliance Offset Protocols for offset projects located outside the United States;
- Consider defining direct environmental benefits to the state (DEBS) so that Offset Protocol Ozone Depleting Substances located outside of California provide DEBS.

¹ No part of this document purports to present New York University School of Law's views, if any.

² See California Air Resources Board, Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (2018) § 95989, https://www.arb.ca.gov/regact/2018/capandtrade18/ct18pro.pdf. [hereinafter Proposed Amendments]; Cal. Health & Safety Code § 38562.

We briefly elaborate on each of these points below. Policy Integrity looks forward to remaining engaged and throughout the finalization and implementation of regulations under AB 398.

Background

In 2006, California enacted Assembly Bill 32 (AB 32), requiring a sharp reduction in greenhouse gas emissions.³ The goal was to return the state to 1990 emissions levels by 2020.⁴ ARB was charged with attaining this goal by promulgating regulations. Beginning in 2012, ARB implemented the nation's largest cap-and-trade program.⁵ The program caps aggregate greenhouse gas emissions from sources in the state and requires certain emitters (covered entities) to hold an allowance for each ton of carbon they emit. Free allowances are allocated to firms by the state, while the remainder is placed up for auction. Those allowances not sold at auction are placed in a reserve for possible future sale.⁶ The auction market for allowances is administered by ARB and is subject to various constraints such as the Auction Reserve Price (price floor) and reserve tiers. Additionally, firms are free to buy and sell allowances amongst themselves.⁷ Allowances are also available to firms that are able to document carbon offsets: verifiable, actual emissions reductions achieved elsewhere within the United States.⁸ Under this program, California successfully met its goal of reaching 1990 levels two years early.⁹

In 2017, California legislatively renewed its cap-and-trade program in AB 398, extending it to 2030 and adding a variety of new features to improve the program's performance. AB 398 created a price ceiling in hopes of reducing market volatility and maintaining reasonable allowance prices in the face of increasingly ambitious greenhouse gas reduction targets. As a further stabilization measure, AB 398 added two price reserve tiers below the ceiling, allowing for a supply increase when the market price reaches a particular level. Like AB 32, AB 398 tasks ARB with implementing its program through regulations.

³ See Cal. Health & Safety Code § 38500 et seq.

⁴ Assembly Bill 32 Overview, California Air Resources Board, https://www.arb.ca.gov/cc/ab32/ab32.htm (last visited Oct. 12, 2018).

⁵ California Cap and Trade, CENTER FOR CLIMATE AND ENERGY SOLUTIONS, https://www.c2es.org/content/california-cap-and-trade/ (last visited Oct. 21, 2018).

⁶, CALIFORNIA AIR RESOURCES BOARD, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM (2015) https://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf.

⁷ Id.

⁸ *Offset Credit Issuance*, CALIFORNIA AIR RESOURCES BOARD, https://www.arb.ca.gov/cc/capandtrade/offsets/issuance/issuance.htm (last visited Oct. 12, 2018).

⁹ Press Release, California Air Resources Board, Climate Pollutants Fall Below 1990 Levels for First Time (July 11, 2018) (on file with author).

¹⁰ Jason Ye, Summary of California's Extension of its Cap-and-Trade Program, Center for Climate and Energy Solutions (2017) https://www.c2es.org/site/assets/uploads/2017/09/summary-californias-extension-its-cap-trade-program.pdf.

¹¹ Todd Schatzki & Robert Stavins, *Key Issues Facing California's GHG Cap- and-Trade System for 2021-2030*, Mossavar-Rahmani Center for Business & Government at Harvard Kennedy School, at 2 (2018), https://www.hks.harvard.edu/sites/default/files/FWP_2018-02_0.pdf [hereinafter "*Key Issues*"]. ¹² *Id*.

¹³ CAL. HEALTH & SAFETY CODE § 38562(c).

Market Design

ARB Should Set Both the Price Ceiling and the Price Floor (Auction Reserve Price) by Taking into Account the Social Cost of Carbon (SC-CO₂)

In its comments of October 27, 2017 and March 16, 2018, Policy Integrity recommended that ARB set the price ceiling at least as high as the Interagency Working Group's (IWG) estimate of the social cost of carbon (SC-CO₂) in order to comply with AB 398's requirement to consider the "full social cost associated with emitting a metric ton of greenhouse gases." As discussed in those comments, the IWG's 2015 "central" estimate is the best currently available estimate for the external cost of each ton of carbon dioxide emitted in a given year. After considering the SC-CO₂, ARB has set the price ceiling at \$61.25 (in 2018 dollars) for 2021, with regular increases phasing in through 2030. These prices are consistently higher than the IWG's central estimate of the SC-CO₂. Such a price ceiling will help California to internalize the SC-CO₂.

To increase the likelihood that the program will maximize social welfare, ARB should set the price floor—and not just the price ceiling—based on the IWG's central estimate of the SC-CO₂. In particular, ARB should set the price floor and price ceiling symmetrically around the IWG's central estimate of the SC-CO₂. In other words, the difference between the price floor and the SC-CO₂ should be the same as the difference between the price ceiling and the SC-CO₂. By setting the price floor and ceiling in this way, ARB would establish a "price collar" on emissions allowances centered around the best available estimate of the marginal benefit of carbon dioxide reduction.²⁰ Moreover, ARB should explicitly consider the factors that bear upon how wide or narrow the price collar should be.

¹⁴ CAL. HEALTH & SAFETY CODE § 38562 (c)(2).

¹⁵ See Institute for Policy Integrity, Comments on the October 12 California Air Resources Board Cap-and-Trade Regulation Workshop (Oct. 27, 2017), http://policyintegrity.org/documents/2017-10-27_CA_Cap-and-Trade_comments_FINAL.pdf (incorporated into these comments by reference); Institute for Policy Integrity, Comments on the March 2, 2018 California Air Resources Board Cap-and-Trade Regulation Workshop, Preliminary Discussion Draft, and Price Containment Concept Paper, https://policyintegrity.org/documents/Policy_Integrity_2018-03-16_CA_Cap-and-Trade_comments.pdf (incorporated into these comments by reference) [hereinafter "March Comments"].

¹⁶ For more on the Interagency Working Group on the Social Cost of Greenhouse Gases, its SC-CO₂, estimates, and the SC-CO₂'s applications in state policy, see ILIANA PAUL ET AL., INST. POL'Y INTEGRITY, THE SOCIAL COSTS OF GREENHOUSE GASES AND STATE POLICY 9-12 (2017), http://policyintegrity.org/files/publications/SCC_State_Guidance.pdf.

¹⁷ See California Air Resources Board, Public Hearing to consider the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation, Staff Report: Initial Statement of Reasons (2018) 35–39, https://www.arb.ca.gov/regact/2018/capandtrade18/ct18398.pdf [hereinafter Statement of Reasons].

¹⁸ Id. at 192 tbl. 16.

¹⁹ Compare id. (setting out the price ceiling between 2021 and 2030) with id. at 37 tbl. 6 (describing the IWG estimates of the SC-CO₂).

²⁰ See Peter John Wood & Frank Jotzo, Price Floors for Emissions Trading, 39 ENERGY POLICY 1746, 1751 (2011).

We first outline why these amendments to ARB's proposal would help to internalize the full SC-CO₂. We then clarify that ARB has the legal authority to make them.

Why and How to Base the Price Floor on the SC-CO₂

A cap-and-trade program maximizes welfare when the marginal cost of abatement achieved under the program is equal to the marginal benefit of resulting emissions reductions.²¹ Assuming, then, that the central estimate of the SC-CO₂ accurately represents the marginal benefit of carbon dioxide reductions, welfare will be maximized if allowances clear at the central estimate. In order to maximize social welfare, allowances should clear at the IWG's central estimate of the SC-CO₂. When allowances clear at the SC-CO₂, the full SC-CO₂ is internalized and, accordingly, covered entities have the optimal incentives to reduce emissions. Moreover, as we have discussed, the IWG's central estimate of the SC-CO₂ is the best available estimate of it.

The price floor and the price ceiling are ways of insuring against uncertainty about market conditions. If the cost of reducing emissions is smaller than anticipated, there will be less demand for allowances, and accordingly allowances will clear for less than the social cost of carbon. Conversely, if the cost of reducing emissions is greater than anticipated, there will be more demand, and allowances will clear for more than the social cost of carbon. A price floor mitigated against the former form of uncertainty; a price ceiling mitigates against the latter.

Establishing a symmetric price collar around the ideal price of an allowance—in this case, the central estimate of the SC-CO₂—would effectively manage this uncertainty.²² If the collar's midpoint is higher than the SC-CO₂, the market structure provides relatively more insurance against the risk of underestimating the cost of reducing emissions.²³ Conversely, if the collar's midpoint is lower than the SC-CO₂—as it is under ARB's proposal—it provides relatively more insurance against the risk of overestimating the cost of reducing emissions.²⁴ Both of these risks should be given equal priority in the market structure, in order to optimize for the likelihood of the market clearing at a price that maximizes social welfare.²⁵

The risk of overestimating the cost of reducing emissions has been especially salient in California—both in the pre-2020 program and in comments on the post-2020 program—making it especially important that ARB peg not just its price ceiling, but also its price floor to the central estimate of the SC-CO₂. Numerous commenters have raised concerns that

²¹ See Dallas Burtraw, Karen Palmer & Danny Kahn, *A Symmetric Safety Valve*, RESOURCES FOR THE FUTURE, 3 (2009), http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-09-06.pdf ("Policymakers advance economic efficiency when they set policy goals at levels that equate the marginal costs of additional pollution controls with the marginal benefits of improvements in environmental quality.").

²² See id.

²³ Id.

²⁴ Id.

²⁵ See id. at 27 ("[A]lthough a high-side safety valve improves welfare, a symmetric safety valve improves welfare even further.").

California is oversupplied with allowances.²⁶ Throughout the history of California's cap-andtrade program, the price of allowances has remained at or near the price floor.²⁷ AB 398 was designed in part to address the glut of allowances that kept market prices hovering near the price floor and sometimes not clearing at all.²⁸ However, several experts have predicted that these consistently low prices will continue into the post-2021 regime.²⁹ Accordingly, if the price floor is not set relatively close to the central estimate of the SC-CO₂, California's capand-trade program may fail to send a price signal that accurately reflects the damage caused by carbon emissions.

Though other commenters have suggested a number of solutions to the issue of overallocation,³⁰ basing the price floor on the SC-CO₂ would be both a simple and effective way to mitigate the problem. The resulting higher prices, combined with our suggestion (further explained below) to raise the prices of unsold allowances, will mean that excess allowances will go unsold at market and later placed in the reserve—in effect, "removing" them from the marketplace.

In addition to designing the price collar to be symmetrical around the SC-CO₂, ARB should also consider the appropriate width of the price collar—that is, the distance between the price ceiling and the price floor. By setting the price ceiling at \$61.25 and the price floor at \$16.77 in 2021, ARB has adopted a relatively wide price collar.³¹ ARB should more explicitly explain whether this is the optimal width of the price collar, and it should consider adopting a narrower one. California should set the width of the collar at a level that will maximize expected social welfare, taking into account uncertainty regarding the characteristics of market participants, the distribution of expected damages from carbon emissions, leakage, and other relevant concerns.³² In making this determination, ARB should use analytical tools

²⁶ See, e.g., Mason Inman, Michael Mastradrea, & Danny Cullenward, California's "Self-Correcting" Cap-And-Trade Auction Mechanism Does Not Eliminate Market Overallocation, NEAR ZERO (May 23, 2018), available at http://wp.nearzero.org/wp-content/uploads/2018/05/Near-Zero-self-correction-research-note.pdf; Busch, Oversupply Grows in the Western Climate Initiative Carbon Market 3 (Dec. 2017), https://energyinnovation.org/wp-content/uploads/2018/02/WCI-oversupply-grows-February-update.pdf. ²⁷ See id. at 17-18.

²⁸ See, e.g., David Roberts, California is About to Revolutionize Climate Policy... Again, Vox (May 3, 2017), https://www.vox.com/energy-and-environment/2017/5/3/15512258/california-revolutionize-cap-and-

²⁹ Severin Borenstein, James Bushnell & Frank Wolak, Energy Institute at Haas, California's Cap-and-Trade Through 2030: Α Preliminary Supply/Demand Analysis, https://ei.haas.berkeley.edu/research/papers/WP281.pdf.

³⁰ See, e.g., Near Zero, Near Zero Comments on April 18 Workshop, https://www.arb.ca.gov/lists/comattach/1200-ct-4-26-18-wkshp-ws-Uz1RMlw8BSQKU1Qu.pdf; Resources for the Future, Comments for California on Revisions to the Cap-and-Trade Regulation, https://www.arb.ca.gov/lists/com-attach/1153-ct-4-26-18-wkshp-ws-WzlUJwZ1BCMHcwJj.pdf.

³¹ See STATEMENT OF REASONS, supra note 17, at 30 tbl. 4 (listing values of price ceiling and price floor).

³² See, e.g., Harrison Fell, Dallas Burtraw, Richard Morgenstern, Karen Palmer & Louis Preonas, Soft and Hard *Price Collars in a Cap-and-Trade System, Resources For the Future (2010)*

http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-10-27.pdf (using predetermined round numbers as a collar width without tying them to the data itself); Alyssa Gilbert, Paul Blinde, Long Lam & William Blythe, Cap-Setting, Price Uncertainty and Investment Decisions in Emissions Trading Systems, U.K. Department of Energy and Climate Change, at 8 (2014)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/31191

that are capable of assessing decisions in a stochastic setting, because uncertainty plays a key role in the agency's decisionmaking.

ARB's Has Legal Authority to Base the Price Floor on the SC-CO2

ARB has the legal authority to base the price floor on the SC-CO₂. AB 398 does not prescribe how ARB is to set the price floor. Instead, it gives ARB broad discretion "to adopt greenhouse gas emissions limits and emissions reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit."³³ AB 32 provided similarly broad discretion,³⁴ and ARB's prior regulations implementing the price floor³⁵ reflect ARB's grant of authority to "minimize costs and maximize the total benefits to California."³⁶ Basing the price floor on the SC-CO₂ would be consistent with this authority.

ARB Should More Thoroughly Address How Its Concerns About Leakage Are Reflected in the Proposed Pricing Structure

In accordance with a statutory mandate, ARB has made leakage a central concern in its Proposed Amendments.³⁷ ARB cites leakage as a material factor in several of its market design decisions, including the setting of the initial 2021 price ceiling,³⁸ the setting of cost containment prices,³⁹ and the allocation process.⁴⁰

ARB should more thoroughly explain how leakage informed these decisions. For example, ARB explains that it has not set the price ceiling at a higher value because doing so "may lead to leakage."⁴¹ ARB should elaborate on why a higher price ceiling would do this. Among other things, it should explain which economic activities might relocate out of California at which price points; quantitatively describe the relationship between price point and leakage; and articulate how it is balancing the prevention of leakage against other statutory and policy goals, such as the internalization of the SC-CO₂.

^{4/}EU_ETS_cap-setting_project_REPORT.pdf (explaining that the width of the price collar is a political choice that is a function of the certainty desired).

³³ CAL. HEALTH & SAFETY CODE § 38562(a).

³⁴ See Cal. Health & Safety Code §§ 38510; 38560; 38570; 39600.

³⁵ See Cal. Code Regs. tit. 17 § 95911 (b)–(c).

³⁶ See Cal. Health & Safety Code § 38562(b)(1).

³⁷ CALIFORNIA AIR RESOURCES BOARD, PUBLIC HEARING TO CONSIDER THE PROPOSED AMENDMENTS TO THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET-BASED COMPLIANCE MECHANISMS REGULATION, STAFF REPORT: INITIAL STAFF REPORT, app. C at 4 (2018), https://www.arb.ca.gov/regact/2018/capandtrade18/ct18sria.pdf [hereinafter "REGULATORY IMPACT ANALYSIS"].

³⁸ *Id.* at 10

³⁹ *Id.* at 11.

⁴⁰ Id. at 39.

⁴¹ See Statement of Reasons, supra note 17, at 39.

ARB Should Preferentially Allocate Unsold Allowances to the Price Ceiling, In Order to Increase the Likelihood That They Will Fully Internalize the Cost of Greenhouse Gas Damages

As we explained in our March 16, 2018, comments on ARB's Concept Paper, if the program's primary goal is to internalize the external cost of carbon dioxide emissions, it would be best served by allocating all allowances that go unsold for 24 months between 2021 and 2030 to the price ceiling.⁴² Instead, ARB has proposed to divide such unsold allowances among the two price reserve tiers. Allowances in those tiers will be priced at \$39.01 and \$50.13,⁴³ below the IWG's central \$50.65 estimate for the external cost of carbon dioxide emitted in 2020.⁴⁴ In other words, none of the unsold allowances that go unsold between 2021 and 2030 will be allocated to prices that fully internalize the SC-CO₂.⁴⁵

That said, the pricing of unsold allowances may take into consideration several factors other than the external cost of carbon dioxide emissions.⁴⁶ These include the cost to consumers, the potential for price volatility, and other factors affected by the allocation of these reserves. If ARB finds that the potential for volatility or other adverse effects outweigh the benefit of certainty that the market will fully internalize carbon dioxide-related externalities, it could justifiably price at least some unsold allowances at levels below the price ceiling.⁴⁷ In determining whether this is the case, however, ARB should use analytical tools that can account for uncertainty through stochastic modeling.

Ultimately, ARB should—to the furthest extent reasonable given costs to consumers, potential price volatility, and other relevant factors—allocate unsold allowances to price tiers that fully account for the marginal damage caused by each ton of carbon dioxide.⁴⁸

Offsets

ARB Should Consider Adopting Compliance Offset Protocols for Offset Projects Located Outside of the United States

Policy Integrity agrees with ARB that "it is important for California to consider the importance of reducing emissions from tropical deforestation and from other uncapped sectors."⁴⁹ As ARB correctly notes in its Statement of Reasons, "[I]t is not important where a reduction [in greenhouse gases] occurs since the science supports that a GHG reduction anywhere is a benefit everywhere."⁵⁰ Moreover, some offset projects located outside the United States can have great environmental co-benefits. An offset project that prevented the

⁴² See March Comments, supra note 15.

⁴³ STATEMENT OF REASONS, *supra* note 17, at 30.

⁴⁴ *Id*. at 37.

⁴⁵ Id. at 34.

⁴⁶ See generally Cal. Health & Safety Code § 38562.

⁴⁷ *Id.* at 4.

⁴⁸ See March Comments, supra note 15, at 5.

⁴⁹ STATEMENT OF REASONS, *supra* note 17, at 50.

⁵⁰ *Id.* at 50.

deforestation of the Amazon rainforest, for example, would be a boon to conservation efforts.⁵¹

ARB has the legal authority to approve these offset projects. AB 398 invests ARB with broad discretion in its regulation of offset projects. The only geographic restriction on offset projects provided by statute is a requirement that at least one-half of all offsets provide direct environmental benefits to the state (DEBS).⁵² All other offset projects are geographically unlimited.

Of course, any offset project—located inside or outside the United States—must provide "real, additional, quantifiable, permanent, verifiable, and enforceable" reductions of greenhouse gases.⁵³ ARB should explore drafting a tropical deforestation offset protocol that addresses these concerns.

ARB Should More Thoroughly Consider Whether Offset Protocol Ozone Depleting Substances Located Outside of California Provide Direct Environmental Benefits to the State (DEBS)

Under the Proposed Amendments, Compliance Offset Ozone Depleting Substances (ODS) provide DEBS only if the ODS offset projects are located in the state of California or if they are approved under the general procedure for determining whether out-of-state offset projects provide DEBS.⁵⁴ ARB should reconsider defining DEBS so that all ODS offset projects provide DEBS *per se*.

ARB attributes two direct environmental benefits to the reduction of ozone-depleting substances.⁵⁵ The first is the protection of stratospheric ozone, which is an important guarantor of public health.⁵⁶ The second is the reduction of greenhouse gases and toxic pollutants that will result from converting to newer, more efficient refrigerants.⁵⁷ ARB believes that converting to more efficient refrigerants will lessen the demand for electricity, which in turn will reduce greenhouse gases and atmospheric co-pollutants.⁵⁸

ARB should more thoroughly explain why these rationales justify its position that only ODS offset projects in California provide DEBS *per se*. Like greenhouse gases, ODS are global pollutants.⁵⁹ From a human health perspective, it does not matter whether ODS are emitted in California or out-of-state.

⁵¹ See Michael Oppenheimer and Steve Schwartzman, How California Can Save the Amazon, N.Y. TIMES (Aug. 29, 2018), https://www.nytimes.com/2018/08/29/opinion/california-climate-save-amazon.html.

⁵² CAL. HEALTH & SAFETY CODE §38562 (c)(2)(E)(i).

⁵³ Cal Code Regs. tit. 17 § 95970(a)(1).

⁵⁴ See Proposed Amendments, supra note 2, at § 95989.

⁵⁵ STATEMENT OF REASONS, *supra* note 17, at 52–53.

⁵⁶ *Id*.

⁵⁷ *Id*.

⁵⁸ *Id.*

⁵⁹ See U.S. EPA, EPA'S REPORT ON THE ENVIRONMENT: 2008, at 7, https://cfpub.epa.gov/roe/documents/EPAROE_FINAL_2008.PDF ("Finally, a few air pollution issues are

Conclusion

California continues to be a leader in developing thoughtful and ambitious climate policy. With its Proposed Amendments, ARB has taken another significant step towards reducing carbon emissions while also promoting economic efficiency and environmental co-benefits. To better ensure that the cap-and-trade program fully internalizes the cost of greenhouse gas emissions, ARB should take the SC-CO₂ into account when setting its price floor, more thoroughly consider the expected consequences of the price collar established under its regulations, and preferentially allocate unsold allowances to price tiers that fully account for the marginal damage caused by each ton of carbon dioxide. To unlock large environmental co-benefits, ARB should consider adopting Compliance Offset Protocols for offset projects located outside the United States. And to secure co-benefits for California in the most efficient way possible, ARB should consider defining DEBS so that Offset Protocol Ozone Depleting Substances located outside of California provide DEBS. These initiatives would further improve upon California's already admirable progress.

Respectfully submitted,

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global in nature Stratospheric ozone depletion, as another example, is affected by releases of ozone-depleting substances from countries worldwide.")