



Institute *for*
Policy Integrity

NEW YORK UNIVERSITY SCHOOL OF LAW

March 16, 2018

California Air Resources Board
VIA ELECTRONIC SUBMISSION

Subject: Comments on the March 2, 2018 California Air Resources Board Cap-and-Trade Regulation Workshop, Preliminary Discussion Draft, and Price Containment Concept Paper

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 March 2, 2018 workshop,² Preliminary Discussion Draft,³ and Price Containment Concept Paper,⁴ regarding development of the regulations to implement the cap-and-trade provisions in Assembly Bill 398 (AB 398). 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.

As noted in our October 27, 2017 comments on the October 12, 2017 workshop,⁵ AB 398 extends California's AB 32 cap-and-trade program. Though many program design details are specified in AB 398, the statute instructs ARB to develop some design features through

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

² California Air Resources Board, Amendments to Cap-and-Trade Regulation Workshop presentation (Mar. 2, 2018), https://www.arb.ca.gov/cc/capandtrade/meetings/20180302/ct_workshop_3-1-18.pdf [hereinafter "ARB PowerPoint"].

³ CALIFORNIA AIR RESOURCES BOARD, PRELIMINARY DISCUSSION DRAFT OF POTENTIAL CHANGES TO THE REGULATION FOR THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET-BASED COMPLIANCE MECHANISMS (2018), https://www.arb.ca.gov/cc/capandtrade/meetings/20180302/ct_pdd_02232018.pdf [hereinafter "PRELIMINARY DISCUSSION DRAFT"].

⁴ CALIFORNIA AIR RESOURCES BOARD, PRELIMINARY CONCEPTS: PRICE CONTAINMENT POINTS, PRICE CEILING, AND ALLOWANCE POOLS (2018), https://www.arb.ca.gov/cc/capandtrade/meetings/20180302/ct_price_concept_paper.pdf [hereinafter "CONCEPT PAPER"].

⁵ 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) [hereinafter "October 27 Comments"].

the regulatory process. ARB has held two public workshops on implementing AB 398 and has opened its March 2, 2018 workshop and draft documents to public comment.

ARB's Price Containment Concept Paper includes many design features that are consistent with our October 27 comments and will help to ensure that the cap-and-trade program will account for the externalities associated with greenhouse gas emissions, while also promoting overall societal well-being. In further developing the AB 398 regulations, ARB should:

- Continue to set the price ceiling for permits at least as high as the social cost of carbon, as it has sensibly done in the Price Containment Concept Paper; and
- Preferentially allocate remaining unsold allowances to the price containment reserve with the highest price, in order to help ensure that the program will fully internalize the costs of carbon dioxide emissions.

We briefly elaborate on each of these points below. Policy Integrity looks forward to remaining engaged and continuing these discussions in more detail throughout the AB 398 regulation development process.

ARB Correctly Has Set the Price Ceiling for Permits at Least as High as the Social Cost of Carbon

Our October 27 comments recommended that ARB set the price ceiling at least as high as the Interagency Working Group's 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."⁶ As we discussed in those comments, the Interagency Working Group's 2016 "central" estimate of \$58 per ton of CO₂⁷ (in 2015 dollars) is the best currently available estimate for the external cost of carbon dioxide emitted in the year 2030.⁸ ARB's process for setting the price ceiling is reasonable and consistent with this recommendation.

In its Price Containment Concept Paper, ARB indicates that it expects that the price ceiling for 2030 will be set between \$81.90 and \$150 in 2015 dollars.⁹ In setting this value, ARB considered, among other factors, the value of the Social Cost of Carbon used in the 2017 Scoping Plan Update (\$57 per ton of CO₂ (\$2015) in 2030), as well as "[v]oluntary

⁶ Cal. Health & Safety Code §38562 (c)(2).

⁷ For emissions in the year 2030, in 2015 dollars. INTERAGENCY WORKING GRP. ON SOC. COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12,866, at 4 tbl.2 (2016) [hereinafter "2016 TSD"], *available at* https://www.obamawhitehouse.gov/sites/default/files/omb/infocore/scctsd/final_clean_8_26_16.pdf. Inflated to 2015 dollars with the Bureau of Labor Statistics Inflation Calculator, *available at* <https://data.bls.gov/cgi-bin/cpicalc.pl>.

⁸ 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., INSTITUTE FOR POLICY INTEGRITY, THE SOCIAL COSTS OF GREENHOUSE GASES AND STATE POLICY 9-12 (2017), *available at* http://policyintegrity.org/files/publications/SCC_State_Guidance.pdf.

⁹ CONCEPT PAPER, *supra* note 4, at 7.

corporate internal carbon pricing that can range from \$800 globally and as high as \$150 within the United States” and an “[a]cademic study that found the existing social cost of carbon is too low and could be closer to \$220.”¹⁰ The Social Cost of Carbon reflects expert consensus on what the likely economic damage from carbon emissions will be. Incorporating consensus estimates from the IWG, multiple corporate carbon prices, and recent academic literature should help improve the accuracy of ARB decisionmaking. In general, consensus estimates are more accurate than estimates derived from any single source,¹¹ and, therefore, these estimates provide reasonable benchmarks for ARB to use in setting a price ceiling.¹²

This expected value is properly above the SC-CO₂, which will help ensure that the full value of external damage caused by greenhouse gas emissions can be internalized. Additionally, as explained in our October 27 comments, IWG’s SC-CO₂ estimate is likely a lower bound on the true social cost of carbon emissions, due to omitted impacts, the undervaluation of extreme events and tipping points, as well as other factors.¹³ Therefore, it is appropriate that ARB plans to set the price containment points for the individual tiers above the SC-CO₂, as this approach will help ensure the full costs of external damage caused by climate change can be internalized.¹⁴

Overall, ARB’s proposed approach in setting the price ceiling is reasonable, and the final price ceiling value adopted should continue to be set at least as high as the Interagency Working Group’s SC-CO₂ “central” estimate.

¹⁰ CONCEPT PAPER, *supra* note 4, at 6.

¹¹ Bradley Efron, *Biased Versus Unbiased Estimation*, 16 ADV. IN MATH. 259, 260 (1975) (showing that any prediction that pools over multiple estimates will be more accurate than a single estimate on average).

¹² Individual studies could potentially be outliers, so their results should be interpreted with caution, but they are still reasonable to consider as a data point in the process of choosing an appropriate value.

¹³ Peter Howard & Derek Sylvan, *The Economic Climate: Establishing Expert Consensus on the Economics of Climate Change* (Inst. Policy Integrity Working Paper 2015/1); Robert S. Pindyck, *The Social Cost of Carbon Revisited* (Nat’l Bureau of Econ. Res. No. w22807, 2016) (\$80-\$100 is the trimmed range of estimates at a 4% discount rate; without trimming of outlier responses, the estimate is \$200). The underestimation results from a variety of factors, including omitted and outdated climate impacts (including ignoring impacts to economic growth and tipping points), simplified utility functions (including ignoring relative prices), and applying constant instead of a declining discount rate. See Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 NATURE 173 (2014) and J.C.J.M. vandenBergh & W.J.W. Botzen, *A Lower Bound to the Social Cost of CO₂ Emissions*, 4 NATURE CLIMATE CHANGE 253 (2014) (proposing \$125 per metric ton of carbon dioxide in 1995 dollars, or about \$200 in today’s dollars, as the lower bound estimate). See also Frances C. Moore & Delavane B. Diaz, *Temperature Impacts on Economic Growth Warrant Stringent Mitigation Policy*, 5 NATURE CLIMATE CHANGE 127 (2015) (concluding the SCC may be six times higher after accounting for potential growth impacts of climate change). Accounting for both potential impacts of climate change on economic growth and other omitted impacts, Dietz and Stern find a two- to seven-fold increase in the SCC. Simon Dietz & Nicholas Stern, *Endogenous Growth, Convexity of Damage and Climate Risk: How Nordhaus’ Framework Supports Deep Cuts in Carbon Emissions*, 125 THE ECONOMIC JOURNAL 574 (2015).

¹⁴ Compare ARB PowerPoint, *supra* note 2, at 15 (estimate price for lowest tier at \$72.9 (\$2015) in 2021) with 2016 TSD, *supra* note 7, at 4 tbl.2 (\$48.70 (\$2015) in 2020).

ARB should preferentially allocate unsold allowances to the price ceiling, in order to help ensure that it will fully internalize the costs of greenhouse gas damages

Our October 27 comments responded to ARB's request for comment on how to allocate allowances that have been unsold for 24 months by recommending that ARB preferentially assign unallocated allowances to the higher containment reserve or price ceiling, especially making sure that any unallocated allowances are sold at or above the SC-CO₂.¹⁵ This allocation would help to ensure that the full costs of greenhouse gases can be internalized by the program.

Similarly, in its March 2 Workshop PowerPoint, ARB requests feedback on how 52,400,000 unallocated allowances from years 2021 to 2030 should be allocated "between the price ceiling and the new post-2020 Reserve."¹⁶

As described in the previous section, the preliminary design documents suggest that all of the reserve price tiers will be set above the SC-CO₂. This price level means that sales at each of the price tiers could be potentially sufficient to internalize the costs of greenhouse gas emissions. However, given the fact that the SC-CO₂ is likely a lower bound on the true social cost of climate damages, due to omitted impacts, if ARB wants to be sure to fully internalize these costs, it would be safer to allocate the unassigned allowances to the price ceiling. Moreover, research suggests that a relatively small number of cost containment allowances is sufficient to balance the goals of reduced price volatility and achievement of environmental goals.¹⁷ This research suggests that priority should be given to internalizing climate change externalities when setting cost containment reserve sizes and trigger prices for greenhouse gas cap and trade programs.

However, as ARB thoughtfully describes in its Concept Paper, fully internalizing the externalities of greenhouse gas emissions is not the only factor at issue in this analysis.¹⁸ ARB must also consider the cost to consumers, the potential for price volatility, and other factors that the design of these reserves could impact. If the potential for volatility and other adverse effects outweighs the benefits from the certainty of fully internalizing the damages, then some of the additional allowances could be allocated to the lower priced tier without detracting from achieving the program's goals (assuming that it is still priced at or above the SC-CO₂).

In addition, in this discussion about the relationship between allocation distribution and price points, ARB notes, "Given the existence of complementary policies, the Cap-and-Trade Program allowance price will reflect the need to achieve the estimated 38 percent of GHG emissions reductions needed to achieve the SB 32 target. The Auction Reserve Price and new post-2020 Reserve will need to reflect the role of the Cap-and-Trade Program with

¹⁵ October 27 Comments, *supra* note 5, at 4.

¹⁶ ARB PowerPoint, *supra* note 2, at 19; CONCEPT PAPER, *supra* note 4, at 9.

¹⁷ See, e.g., Harrison Fell et al., *Soft and Hard Price Collars in a Cap-and-Trade system: A Comparative Analysis*, 64 J. ENVIRO. ECON. MGMT. 183 (2012).

¹⁸ CONCEPT PAPER, *supra* note 4, at 11-13.

complementary policies.”¹⁹ It is true that California’s other greenhouse gas reduction programs will likely affect the allowance price.

However, it is not clearly true, as ARB states, that “the Cap-and-Trade Program allowance price does not need to reflect the cost of each metric ton of GHG emissions reductions needed to achieve the SB 32 target.”²⁰ It is unclear from the document whether ARB means that the allowance price does not need to reflect the *abatement* cost from other programs or whether the allowance price does not need to reflect the *damage* cost from each ton of greenhouse gases reduced by the cap-and-trade program itself. Indeed, the allowance price does not need to reflect the abatement costs from other programs outside the trading system, such as the Renewable Portfolio Standard and the Short-Lived Climate Pollutants Program. However, the allowance price should, in fact, reflect the marginal damage cost from each ton of greenhouse gases reduced by the cap-and-trade program. The marginal external damage from each ton of CO₂ reductions (the SC-CO₂) is unchanged by the existence of other California greenhouse gas policies, and in order to maximize social welfare, ARB should design the market such that the allowance price will converge at the SC-CO₂.

Conclusion

California continues to be a leader in developing thoughtful and ambitious climate policy with its passage of AB 398. ARB is already taking significant steps to design the program to fully internalize the costs of greenhouse gas emissions. As it has in the Concept Paper, ARB should set the final price ceiling and price containment points for permits at least as high as the IWG’s SC-CO₂. Additionally, if ARB wants to ensure that it will fully internalize the costs of greenhouse gas damages, it should preferentially allocate unsold allowances to the price ceiling.

Respectfully submitted,

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¹⁹ CONCEPT PAPER, *supra* note 4, at 12.

²⁰ *See id.*