

2022 ANNUAL REPORT OF THE INDEPENDENT EMISSIONS MARKET ADVISORY COMMITTEE

February 3, 2023

Dallas Burtraw, Committee Chair, Darius Gaskins Senior Fellow – Resources for the Future

Danny Cullenward, Committee Vice Chair, Policy Director – CarbonPlan,

Meredith Fowlie, Class of 1935 Endowed Chair in Energy – University of California, Berkeley, Department of Agricultural & Resource Economics

Brian Holt, Business Manager/ Financial Secretary – IBEW Local 428

Katelyn Roedner Sutter: Senior Manager, U.S. Climate – Environmental Defense Fund

Ross Brown: Principal Fiscal and Policy Analyst – Legislative Analyst’s Office, California (Nonvoting Committee Member)

Convener: California Environmental Protection Agency – Yana Garcia, Secretary; Shereen D’Souza, Deputy Secretary; Bill Dean, Senior Advisor, Jaimie Huynh, Advisor.

2022 ANNUAL REPORT OF THE INDEPENDENT EMISSIONS MARKET ADVISORY COMMITTEE.....	1
Introduction and Summary.....	3
References.....	5
Chapter 1. Carbon Market Reform.....	6
Recommendations	11
References.....	13
Chapter 2. No-Trade Zones and Facility-Level Emission Limits	14
Background	14
Geographic restrictions	15
Trading limits.....	15
Source-specific limits	16
Additional design questions	16
Recommendations	17
Chapter 3. Federal and State Climate Policy Interactions	18
Interactions with California’s GHG market	18
Interactions with regulatory standards such as the RPS, storage mandate, and other programs.....	20
Interactions with consumer subsidies.....	20
Recommendations	22
References.....	23
Chapter 4. Legal Authority After 2030.....	24
Introduction	24
Explicit statutory authority	24
Implicit statutory authority	25
State constitutional considerations.....	27
Implications for existing implicit authority	28
Implications for new explicit authority.....	29
Conclusion	31
Individual Committee Member Statement — Danny Cullenward	32
References.....	33

Introduction and Summary

Dallas Burtraw and Danny Cullenward

2022 was a banner year for climate policy. At the federal level, the Inflation Reduction Act became law and will direct hundreds of billions of dollars in clean energy and climate investments in the years ahead. Not to be outdone, policymakers in California passed a suite of climate laws, including new clean electricity legislation, a bill to codify the state's long-term climate goals, and a state budget with tens of billions of dollars in climate spending. Meanwhile, the California Air Resources Board approved ambitious zero emissions vehicle standards and finalized its 2022 Scoping Plan, which sets out a technological blueprint for achieving net-zero emissions by 2045.

While the outlook for climate policy has never been stronger nor the state's overall policy objectives clearer, attention now turns to implementation. In this increasingly ambitious setting, the role of the carbon market remains uncertain and in need of additional policy direction.

To date, regulatory measures have likely delivered most of the emission reductions California has achieved, with the carbon market playing a supporting role that delivers cost-effective mitigation and raises much-needed revenues for climate investments. The previous scoping plan called for the carbon market to play a growing role in the state's policy portfolio, but absent structural reforms—potentially including an adjustment to the supply of emission allowances, and a clarification of the program's legal authority beyond 2030—the current program is unlikely to achieve that goal.

This year's report from the Independent Emissions Market Advisory Committee focuses on four topics that are critical to the carbon market's ability to contribute to the state's climate goals.

- **Carbon market reform.** The first chapter concerns options for market reforms. It builds on several years of discussion and analysis from previous committee reports to identify key vulnerabilities in the market and some of the market design opportunities policymakers might consider. Notably, new data on the market's supply-demand balance illustrate the need to review the overall supply of allowances and how those allowances enter the market in relation to California's policy goals. We also address the potential effect of market reform on the state's Greenhouse Gas Reduction Fund, and why changes to the way allowances are sold at quarterly auctions are important to consider as part of any structural reforms.
- **No-trade zones and facility-level emission limits.** The second topic explores how conceptual changes to the market's operation might address concerns about the unequal distribution of air quality burdens across California. Specifically, it examines approaches to restricting allowance trading that were identified by CARB's Environmental Justice Advisory Committee in its final recommendations

on the 2022 Scoping Plan (EJAC, 2022). The committee recognizes that there is an active debate about the impact of the carbon market on air quality disparities in the state's disadvantaged communities. The initial discussion in this chapter is intended to help identify practical options that address these concerns for consideration in the broader policy conversation. The committee thanks the members of the Environmental Justice Advisory Committee who took the time to engage with us on this report and hopes to continue working together in future years' report cycles.

- **Federal and state climate policy interactions.** Our third topic concerns the substantial expansion of federal incentives for clean energy and their likely effects on state policy goals. The influx of new federal support provides a substantial opportunity for California to align its state incentive programs to better amplify and target their impacts. Proceeding as if nothing has changed will undermine the effectiveness of climate programs and increase costs for Californians. We also observe how federal support for clean energy is likely to accelerate mitigation in sectors that are covered by the carbon market. This will tend to reduce allowance demand and therefore could weaken the carbon price signal in the absence of market reforms.
- **Legal authority after 2030.** The fourth and final chapter addresses the carbon market's legal authority. Specifically, it introduces different views about whether the carbon market is legally authorized to continue beyond 2030 and what kinds of legislative action might be needed to authorize or confirm the market's post-2030 operation. The committee hopes to make these complex legal issues more approachable to policymakers and program stakeholders but does not express a view about the correct legal interpretation. We urge policymakers at CARB and in the Legislature take appropriate steps to clarify the carbon market's future after 2030.

We hope this year's annual report helps policymakers identify and explore opportunities to align the state's policy implementation strategy with its ambitious long-term climate targets and build on the legacy of success achieved to date. There is no time to waste. As the committee observed in a comment letter to CARB last summer:

"If California is planning to rely on the cap-and-trade program to close the emissions gap and provide greater certainty of meeting the 2030 greenhouse gas reduction goal, then it needs to act with urgency to ensure the program is fit for this purpose. This means that a cap-and-trade rulemaking needs to commence as soon as possible, and no later than the first quarter of 2023 for potential changes to the program to take effect in 2024." (IEMAC, 2022)

Now that the final 2022 Scoping Plan has identified an even more ambitious target than the minimum required by law — 48% below 1990 emissions by 2030, instead of just 40% — there is even more reason for CARB to act. We encourage policymakers to

consider market reforms and stand ready, as a committee, to help ensure the best information is available to inform policy deliberations.

References

Environmental Justice Advisory Committee, Final 2022 Scoping Plan EJAC Recommendations (September 30, 2022), <https://ww2.arb.ca.gov/resources-related-ab-32-environmental-justice-advisory-committee-2022-scoping-plan-update>

Independent Emissions Market Advisory Committee, IEMAC comments on the Draft 2022 Scoping Plan (June 24, 2022), <https://www.arb.ca.gov/lists/com-attach/4306-scopingplan2022-UThWNQdrWWsLbgFe.pdf>

Chapter 1. Carbon Market Reform

Dallas Burtraw and Katelyn Roedner Sutter

The newly enacted [AB 1279](#) (Muratsuchi, 2022) calls for net zero greenhouse gas emissions and 85 percent statewide reductions in greenhouse gas emissions below the 1990 emission level no later than 2045. The 2022 Scoping Plan indicates that to achieve this outcome the state must achieve economywide emissions reductions greater than the statutory requirement of 40 percent below 1990 levels by 2030. Achieving this accelerated 2030 emissions target will require an evaluation of all relevant programs, including the cap-and-trade program. Limiting emissions at sources covered by the carbon market, which accounts for roughly 75 percent of the state's economywide emissions, can contribute importantly to achieving the economywide target. Positioning the carbon market to play an important role also contributes importantly to the cost effectiveness of the overall policy portfolio.

For the carbon market to fulfill its role requires reform that would tighten the market by adjusting allowance supply, and clarification of the role for the market after 2030, as discussed in the recent report from the Legislative Analyst's Office (LAO 2023). If investors know a carbon price will exist, they can evaluate low-carbon technologies; however, the market will not effectively drive investor behavior if the market's future is uncertain. Ambiguity about the market after 2030 introduces risk to investments in climate-friendly projects relying on a return through the monetization of allowances (or avoiding the need to acquire allowances).

The term "emissions cap" is often misunderstood because it regularly is used not in reference to capping emissions, but to capping the issuance of *new* allowances and other compliance instruments such as offsets. To achieve the accelerated 2030 emissions reduction target requires the "cap" be calibrated to the level of ambition required to meet the state's climate goals. This is like adjusting the direction of a ship over time to have the ship end up where it should go. Accordingly, adjusting the emissions supply by adjusting the cap boosts confidence that the emissions goal will be achieved.

Each previous IEMAC report explained the need for adjustments to the carbon market and described options for adjustments to ensure it contributes to the state's overall objective. The chronology of these reports and the analysis they presented is useful to understanding that market reform has evolved from what was previously an important future consideration to one that is now urgent.

In 2018, IEMAC pointed out the potential that overlapping or companion policies that may be enacted or strengthened would likely reduce allowance prices, reducing the signal provided by the carbon market, and reducing the overall cost effectiveness of the state's climate policy. IEMAC encouraged CARB to consider adjustments to the supply of allowances based on observable metrics such as the allowance price or the quantity of allowances held in private accounts (banked) for future use. IEMAC identified options

including adjustments to the price floor, price points or banking metrics that would adjust the supply of allowances, and revised offset regulations.

A challenge with any adjustment to the carbon market is an administrative intervention suggests another may be forthcoming, thereby undermining confidence in the market. Hence, the 2019 report developed these ideas more fully and recommended that in addition to a potential administrative adjustment “CARB should develop rule-based approaches for adjustments to supply on an automatic basis that can be anticipated by market participants.” Rule-based adjustments would be based on transparent and observable metrics.

The 2019 report expanded the list of potential adjustments to include administrative reform such as delaying or canceling the sale of auctioned allowances and rule-based reform such as introducing an additional price-triggered supply adjustment mechanism like an emissions containment reserve as in the Regional Greenhouse Gas Initiative (RGGI), or a quantity-triggered supply adjustment (based on the number of allowances in circulation, e.g., banked allowances in holding accounts) as in the EU Emissions Trading System. IEMAC also recommended annual transparent reports on allowance banking which would be important to stakeholder ability to analyze the supply of compliance instruments and anticipate future allowance prices.

The committee continued to develop ideas along this line in 2020, when IEMAC’s annual report highlighted the inherent uncertainty in the demand for allowances and how this uncertainty would propagate into price variability in the carbon market. Demand is affected for example by many independent actions such as emissions reductions stimulated by local jurisdictions and businesses, companion regulatory programs, and importantly in 2020 by the pandemic.

The passage of [SB 100](#) (De León, Chapter 312, Statutes of 2018) provides an example of another source of uncertainty, stemming in this case from an overlapping policy that was not anticipated in the modeling that supported the 2017 Scoping Plan. At the time of the 2017 Scoping Plan, the most recent renewable portfolio standard (RPS) set a 50 percent target for 2030 under the [SB 350](#) (De León, Chapter 547, Statutes of 2015). After the 2017 Scoping Plan, in 2018 SB 100 raised the RPS target to 60 percent by 2030 with 100 percent zero carbon electricity generation by 2045. Most recently, [SB 1020](#) (Laird, Chapter 361, Statutes of 2022) requires 90 percent zero carbon electricity by 2035 and 95 percent by 2040. These measures accelerate the introduction of clean energy and reduce the demand for emissions allowances from electric utilities. If the goals are achieved, the emissions from the power sector should fall automatically by roughly 75 million tons or more over the decade. The potential resuscitation of Diablo Canyon is another unanticipated policy change that would reduce the emissions from natural gas fired power generation. Demand for allowances associated with natural gas utilities also appears to be less than anticipated based on CARB’s initial 2011 benchmark for the program. In fact, 2011 gas utility emissions were higher than in any subsequent year. Taken together, electricity and natural gas utility emissions and

associated demand for emissions allowances total over 100 million tons less than were anticipated in the initial program design and subsequent scoping plans. This outcome reduced the demand for emissions allowances, but no associated adjustment has been made in the supply of allowances.

Uncertainty in the market is further illustrated by the expanded policies to promote electric vehicles, which will raise electricity demand and emissions in the electricity sector. However, the increase in electric vehicles will be accompanied by a decrease in gasoline and diesel vehicles which should lead to an overall decrease in emissions.

These types of ongoing changes in the structure of California's economy can be expected but cannot be predicted. The carbon market by design accommodates and responds to these types of changes in the demand and supply balance. Presently, however, that adjustment occurs almost exclusively through changes in the allowance price rather than channeling advantageous changes in the economy into accelerated emissions reductions at covered sources.

Without an adjustment to supply and if the price is above the price floor, a reduction in the demand for allowances leads to *no change* in environmental outcomes at sources governed by the cap-and-trade program. Over the long term, however, reductions in allowance demand, due at least in part to California's ambitious and successful climate policies, have led to low prices that enabled the accumulation of a large bank of emissions allowances that are positioned to re-enter the market and undermine the emissions reduction goals now set forth in AB 1279 and the 2022 Scoping Plan.

In its 2020 report, IEMAC pointed to the forthcoming Scoping Plan process as an opportunity for CARB "to align the future issuance of new allowances with the allowance supplies already available in private and public banks." Further, the committee emphasized the importance of understanding how adjustments to supply would affect the auction revenues available to the Greenhouse Gas Reduction Fund and could trigger a shift of allowance asset value away from the Fund to entities that receive free allocation. This shift is exacerbated by the preferential sale of utility-consigned allowances in the allowance auction. To avoid this reduction in revenues to the Fund, adjustments to supply should be implemented proportionately and consistently across all the ways allowances enter the market - through auction and free allocation.

IEMAC's 2021 report provided greater analysis and specificity about options for potential supply adjustments to the market. The committee expressed a preference for a rule-based measure that automatically adjusts the allowance supply in response to auction outcomes by adding an emissions containment reserve price step and/or raising the price floor. Conditioning offset availability on the auction price or implementing a quantity-based adjustment as in the EU were identified as additional options.

The 2021 report again emphasized the potential this and other adjustments to supply could have on the Greenhouse Gas Reduction Fund and described steps necessary to protect and enhance the Fund. Currently, allowances consigned to the auction by

electricity and natural gas utilities are the first to be sold in the auction before the sale of any state-owned allowances. The whipsaw in auction proceeds accruing to the Fund when the auction price fell to the price floor in 2016 was the result of the priority sale of utility allowances, all of which sold, while many state-owned allowances remained unsold. If policy makers want to stabilize and protect revenues in the Fund, then reform of the auction to scale the sale of all sources of allowances proportionately is necessary.

- One step to protecting revenues in the Greenhouse Gas Reduction Fund is to remove the priority sale of consigned allowances in the auction, and proportionately scale the sale of allowances from all sources at every price step in the allowance supply schedule.

Reforming the auction priority sale of consigned allowances is an important first step that could enable and support other reforms. If substantial adjustments to allowance supply are implemented, then it is unlikely the price floor would be triggered but a reform to the auction design would remain relevant if adjustments to supply involve the introduction of an emissions containment reserve. Reform of the auction design would ensure that a reduction in the supply of allowances sold in the auction in any circumstance does not come exclusively from reducing the sale of allowances that contribute to the Fund.

Perhaps surprisingly, a reduction in the supply of allowances is likely to increase the total economic value of allowances because limiting their supply will increase their price. However, unless there is proportionate reduction in supply across all the ways allowances enter the program, including free allocation to industry, reduction in supply implemented entirely by reducing only the sale of state-owned and utility-consigned allowances sold in the auction would initiate a value shift away from state-owned and utility-consigned allowances to industry.

If an adjustment to supply is implemented administratively through a change in the total annual emissions budget (change the emissions cap) this would affect the allocation to industry in proportion to other sources of supply because the annual emissions budget is part of the formula for output-based allocation to industry. However, if the adjustment occurs automatically through the auction, for example if the price floor or an emissions containment reserve were triggered, then the full weight of the adjustment to allowance supply would be implemented by reducing the supply issued through the auction. Consequently, the proceeds accruing to the Greenhouse Gas Reduction Fund and to utilities could fall. To avoid this, free allocation to industry would need to absorb its share of the supply adjustment to avoid an uneven effect on proceeds accruing to the Fund and to utilities.

- The second step to protecting the Fund is to implement adjustments to supply proportionately and consistently across all the ways allowances enter the market - through auction and free allocation.

Requiring an adjustment to allowances given to industry in proportion to adjustment to other sources of allowance supply has the advantage of preserving symmetry and the perception of fairness throughout the program. With a proportional adjustment across the entire market, the asset value of the market and the value accruing to industry would likely increase. Free allocation to industry would continue to help prevent leakage of economic activity and emissions outside the state; nonetheless, a reduction in the number of free allowances given to industry could increase leakage risk illustrating the potential tradeoffs that are involved in allowance allocation.

We identify two ways that adjustment to industry could be implemented. Free allocation to industry is determined prior to each year based on expected economic activity (output) and emissions rate benchmarks, which together determine expected emissions. If economic activity differs from expectation, a true up to the allocation occurs. One way to align changes in allocation to industry with changes in supply issued through the auction would be to incorporate the changes into the true up. However, auction participants would need to anticipate the adjustment that would occur later, outside the auction, to understand the change in total supply that would result at various auction prices. For example, if the price floor or an emissions containment reserve were triggered reducing the sale in the auction, participants would need to account for changes in the allocation to industry that would occur outside the market to understand the total market demand and supply balance. This complication would undermine the goal of transparency in the carbon market.

A simpler way to align changes in allocation to industry with changes in total allowance supply would be to do so concurrently within the auction. This would require the consignment of all freely allocated allowances to the auction, including those to industry, before those allowances can be used for compliance. This approach would identify an auction price representing the opportunity cost of emissions reductions at all covered sources, contributing to the cost effectiveness of the market. It takes advantage of the auction design with reserve prices such as the price floor price or a potential emissions containment reserve.¹

Consignment of free allowances allocated to industry would preserve the goal of mitigating leakage by cycling the auction proceeds from the consigned allowances back to the original owners of the allowances. It would also contribute to the transparency of the market and strengthen the role of the auction price signal in identifying opportunities for emissions reductions.

The transparency of the market is also potentially undermined by the segregation in the sale of allowances from the allowance price containment reserve several weeks after and with different rules than the primary auction. Allowances from the price containment

¹ The use of auctions with reserve prices enables the implement the Roberts and Spence (1976) solution to the well-known Weitzman (1974) dilemma about the choice of quantity instruments or price instruments in emissions markets when costs and benefits are uncertain.

reserve have not previously entered the market because the allowance price has been well below the relevant price that would trigger their availability. However, the way they might be brought into the market makes possible strategic behavior and bid cycling between the primary auction and price containment reserve sale. Consideration should be given to how the different opportunities to purchase compliance instruments could interact with one another and the possible effect it could have on market behavior. An alternative approach would be to consolidate the allowance price containment reserve in the primary auction, with its allowances made available at reserve prices equal to the allowance price containment reserve price trigger points, analogous to the way the price floor is implemented. This approach would be simpler, reduce the opportunity for strategic behavior, and ensure allowances are allocated to their highest valued use.

The committee has also examined the role of offsets as compliance instruments that contribute to the supply-demand balance in the market. These offsets provide incentives for emission mitigation measures outside of the sectors covered by the cap-and-trade program, and they play a role in managing costs for compliance entities. At the same time, the quality and permanence of forest offsets remain important questions. IEMAC suggests that CARB consider an ex-post assessment of offset program performance to inform the potential retirement of allowances to account for any identified shortcomings. Such an adjustment could further help align the carbon market with the updated emissions reductions goals identified in the revised Scoping Plan.

Before summarizing our findings on the topic of market reform, we draw attention to the appendix authored by committee member Danny Cullenward which surfaces a question about the calculation of the 1990 baseline against which all emissions reduction goals are calibrated. If the question raised there is valid, it would provide an independent basis for revising allowance budgets. The issues raised there are also important to the evaluation of the overall climate policy mix.

Recommendations

1. IEMAC reaffirms the guidance it has developed in its previous reports. A program reform that adjusts the allowance supply and the way supply enters the market appears crucial to achieving the state's climate goals and ensuring the role of the carbon market in achieving the necessary emissions reductions as cost effectively as possible. An administrative change to the allowance supply by adjusting the annual emissions budget may be necessary to initiate this reform.
2. Various and multiple uncertainties make prediction of market equilibrium difficult. The committee recommends a rule-based automatic adjustment to allowance supply as the preferable market design in general to best position the carbon market to adjust to variation in the state economy and to support the role of sector-based regulations.
3. Program reform should address the supply-demand balance accounting for the substantial existing bank. That balance will be influenced further by rulemakings

to implement the Scoping Plan goals. The list of approaches deserving consideration as itemized in IEMAC reports includes:

- a. Implementation of an emissions containment reserve or multiple additional price steps to adjust allowance supply automatically in response to the auction price. A quantity- triggered approach based on the size of the allowance bank is also possible, although as it has been implemented in the EU it has proven to be more complicated.
 - b. Change in the price floor.
 - c. Revision to the cap adjustment factor affecting all forms of allowance supply symmetrically to reduce the issuance of new allowances.
 - d. Initiate an ex post evaluation of the performance of offset projects and make adjustments to allowance supply accordingly.
4. More than one program adjustment likely will be useful. Because it is the most incremental change and one that supports more substantive adjustments, the first option to be considered is the introduction of an emissions containment reserve as is found in the RGGI and Washington State Climate Commitment Act.
 5. If policymakers seek to preserve the revenues going to the GGRF, adjustments to the carbon market must have two characteristics:
 - a. One step to protect the Greenhouse Gas Reduction Fund is to remove the priority sale of consigned allowances in the auction and scale the sale of allowances from all sources proportionately at any price step in the allowance supply schedule.
 - b. A second step to protect the Fund and the value of utility-consigned allowances is to implement adjustments to supply proportionately and consistently across all the ways allowances enter the market - through auction and free allocation. This approach will help advance a sense of fairness and boost confidence in the trading program.
 6. CARB should take steps to identify options and clarify the role of the carbon market after 2030.
 7. Consideration should be given to how the allowance price containment reserve is integrated into the market, including its possible consolidation into the primary auction at relevant reserve prices.
 8. It is urgent for CARB to act quickly on a rulemaking that implements these changes. The beginning of the next compliance period in 2025 is a natural point to implement such changes, but the urgency of these issues argues for an expedited process that could lead to reforms implemented in 2024. The chapter in this report addressing legal opportunities and constraints for CARB in

extending the program beyond 2030 provides a general assessment of CARB's authority to implement a supply adjustment in the current decade including the introduction of additional price steps.

References

Legislative Analyst's Office (LAO), 2023. *Assessing California's Climate Policies — The 2022 Scoping Plan Update* (January 4.), <https://lao.ca.gov/Publications/Report/4656>.

Roberts, Marc J., and Michael Spence. 1976. Effluent charges and licenses under uncertainty. *Journal of Public Economics* 5 (3–4): 193–208.

Weitzman, Martin L. 1974. Prices vs. Quantities. *Review of Economic Studies* 41 (4): 477–91.

Chapter 2. No-Trade Zones and Facility-Level Emission Limits

Katelyn Roedner Sutter and Dr. Meredith Fowlie

Throughout the 2022 Scoping Plan process, the Environmental Justice Advisory Committee (EJAC) has made many substantive recommendations. This chapter will address one of the recommendations that pertains to the cap-and-trade program specifically. Additional recommendations are considered in Chapter 1 on market reform.

EJAC has recommended limiting the compliance flexibility afforded by California's GHG cap-and-trade program. The ability of regulated firms to buy and sell GHG allowances has many advantages with respect to cost effectiveness. However, this flexibility leaves open the possibility that GHG emissions, and associated local pollution, will continue unabated in disadvantaged communities. Herein lies a potential trade off between ensuring that the market can deploy the most cost-effective coordination of GHG abatement and ensuring that California's most vulnerable communities are among the beneficiaries of environmental quality improvements.

One way to negotiate this tradeoff is to limit the extent to which GHG emissions in impacted communities can be accounted for using GHG allowances. Along these lines, EJAC has proposed to designate so-called "no-trade zones" in impacted communities. Specifically:

Facilities in or directly adjacent to disadvantaged communities as defined by Health & Safety Code Section 39711 should be restricted from using allowances to demonstrate compliance. Instead, they should be subject to regulations requiring direct emissions reductions equivalent to the declining caps applicable to the overall program (e.g., 3% per year). This would protect the most impacted communities from excessive exposure to co-pollutants. A proportional number of allowances should subsequently be removed from circulation to avoid further exacerbating existing oversupply issues.

This chapter begins to explore how this concept could be implemented in practice. We note that implementing trading limits would involve several important design decisions with implications for both potential benefits and costs.

Background

California's cap-and-trade program is designed to coordinate cost-effective reductions in a "global" pollutant: greenhouse gas emissions (GHGs). It was not designed to regulate criteria pollutants or toxic air contaminants, which are local, health-harming pollutants. That said, there are local co-benefits at stake. When emissions of local and global pollutants are positively correlated, the location of GHG emissions reductions can have significant local health consequences. In other words, geographic targeting of GHG emission reductions could be justified for local health reasons. The cap-and-trade

program isn't designed to and cannot solve every environmental problem, but it could be tailored to achieve multiple benefits in a targeted way.

Under a cap-and-trade program, an emissions cap is set by the regulator and a corresponding number of GHG allowances are allocated to sources that fall under the cap. To remain in compliance, covered sources must hold allowances equal to their emissions. The ability to freely trade allowances between sources helps to allocate the abatement responsibility to those sources with the lowest abatement costs. Relatively high-cost sources will purchase permits to cover any uncontrolled GHG emissions. Limiting the abatement/compliance flexibility that cap and trade affords can increase the costs of meeting GHG abatement targets. These cost increases should be weighed against the local benefits that constraints on trading could confer.

Geographic restrictions

Some communities in California are disproportionately exposed to environmental hazards such as air pollution. The primary reason to limit allowance trading is to guarantee that the sources located in disproportionately impacted communities are among those that reduce their GHG emissions and associated local pollution. Because the primary concern of the EJAC appears to be geographic distribution of emissions and reductions thereof, this chapter will focus on geographic restrictions on trading. Alternatively, trading restrictions could be imposed on the basis of sector rather than location (i.e. refineries may not purchase allowances). But sectoral limits would be less effective at targeting specific local environmental concerns.

To implement spatially defined limits on allowance trading, the California Air Resources Board (CARB) would need to determine which facilities in which areas would be subject to these limitations. Any methodology for determining which geographies and facilities are subject to trading limitations needs to be clear, transparent, minimize administrative burden, and above all seeks to maximize benefits in communities disproportionately burdened by pollution.

One approach would focus on the most overburdened census tracts based on CalEnviroScreen, given the precedent for using this tool to target investments in disadvantaged communities. CARB would need to determine if the trading restrictions within those census tracts apply to all covered facilities or only those who are not reducing their greenhouse gas emissions.

Trading limits

Once the geographic and facility scope of trading limitations has been established, CARB must determine the nature of the trading limits. One approach would prohibit any buying or selling of permits within restricted areas. This would effectively subject facilities in these areas to prescriptive, source-specific GHG emissions limits.

Alternatively, facilities could be prohibited from buying allowances, but permitted to sell permits. One important benefit of imposing limits on buying but not selling is that this preserves the economic incentive to reduce emissions below the facility-specific cap

that the trading limit effectively imposes. In short, facilities retain the incentive to “over-comply” with their source-specific limits.

Source-specific limits

Under a GHG cap-and-trade program with no trading restrictions, the regulator must only define the aggregate GHG cap. How these permitted emissions are ultimately allocated across sources is determined by the market. The introduction of trading restrictions requires a regulatory determination of the level of emissions permitted at affected sources.

These source-specific caps could be determined via source-specific permit allocations. Allowances could be freely allocated to facilities in line with their specific limit. This approach would mimic a “command and control” system. Under this model, in addition to a significant decrease in compliance flexibility there would likely be decreased revenue for the Greenhouse Gas Reduction Fund.

Alternatively, facilities could be required to purchase all of their allowances at auction. This would effectively impose a “cap and tax” system which raises more revenues than a command-and-control system, but also raises concerns about emissions and economic leakage.

Alternatively, allowances could be distributed using the current “hybrid” approach of Output-Based Allocation (OBA) and auctioning. While there could be future adjustments to the variables within the OBA methodology (i.e. a tighter emissions cap or adjustments to leakage risk factors), this overall approach has served to limit the risk of industrial leakage in California while maintaining the incentive for emission reductions overall. Facilities would *not* be able to purchase any allowances at auction or on the secondary market beyond their facility-specific cap.

Additional design questions

There are many additional design details that would need to be determined through a regulatory process at CARB to enforce facility-specific emission limits within a no- or restricted-trade zone. These include the role of offsets under a facility-specific limit, rules governing the use of banked allowances, and specific considerations for facilities currently required to consign their directly-allocated allowances to auction for the benefit of their ratepayers.

Offsets provide a level of cost-containment and compliance flexibility for entities covered by the cap-and-trade program. Offsets generally represent emission reductions that take place in a location *other than* where the covered facility is located. While this is appropriate from a global climate perspective, if the purpose of employing facility-specific emission limits and trading restrictions is to ensure emission reductions at a specific location, then the use of offsets is inherently incompatible with this approach. If limited offset use were still allowed for cost containment by facilities subject to specific limits, the amount of allowances they are allowed to obtain should be reduced

accordingly to ensure the source-specific limit isn't inflated. This would in turn blunt some of the cost containment benefits of offsets.

Banked allowances present a more complicated situation with respect to facility-specific limits. Presumably, some facilities that could be subject to a facility-specific emissions limit currently have allowances "banked", or saved, for future use or sale. On the one hand, allowing sources to use banked allowances creates a degree of compliance flexibility that may be incompatible with the desire to limit the quantity of emissions permitted in specific communities. On the other hand, eliminating the current bank of allowances would be inherently unfair to facilities who have invested in allowances under the existing set of program rules. These are questions CARB would need to address in a regulatory proceeding to establish trading restrictions and facility-specific emission limits. One pathway could be for CARB to identify the volume of banked allowances held by facilities subject to a proposed facility-specific limit and adjust their future limit accordingly. This would maintain the goal of achieving reductions from specific sources in no- or restricted-trade zones in line with the economy-wide declining cap, while also preserving (and perhaps even enhancing) the investment entities have made in allowances. Another option could be requiring the consignment of banked allowances to the auction with revenue returned to the entity that held the bank originally.

Utilities with facilities in zones that would be subject to a facility-level emissions limit may have more specific considerations that CARB should take up in a regulatory proceeding. Broadly however, while facilities may be subject to a source-specific limit, their allocation could generally follow the same methodology as currently applied, even while remaining below the source-specific limit. If the restrictions on trading still allowed facilities to sell allowances, then there would be no inherent barrier to continuing the approach of consigning allowances to auction for the benefit of ratepayers.

Recommendations

EJAC has been elevating important concerns about the future allocation of air quality benefits under the cap-and-trade program. Trading restrictions that could address these concerns merit a public discussion. This chapter is intended as a point of departure for that discussion.

We have described some design options and we have identified some trade-offs that must be considered in pursuing facility-specific emission limits and/or permit trading restrictions. IEMAC recommends that CARB study these questions closely and include a proposal for consideration in the forthcoming 2023 cap-and-trade informal or regulatory rule-making process.

Chapter 3. Federal and State Climate Policy Interactions

Meredith Fowlie and Dallas Burtraw

California has long been a leader in domestic efforts to mitigate climate change. In 2006, [AB 32](#) (Nuñez, Chapter 788, Statutes of 2006) formally acknowledged this leadership role, committed the state to climate policy leadership going forward, and encouraged other jurisdictions to follow this lead. There are now several examples of how California's climate ambition and climate policy experimentation has shaped policy choices and outcomes in other jurisdictions. For example, California was the first state to mandate a phase-down hydrofluorocarbons (HFCs) in 2018. Nine states were quick to follow California's lead. Then, in 2020, a Federal HFC phase-down policy passed with bipartisan support.

With the recent passage of the Infrastructure Investment and Jobs Act (IIJA) and the Investment Reduction Act (IRA), the federal climate policy landscape has been transformed. The infrastructure bill provides \$65 billion in transmission infrastructure. The IRA directs an estimated \$369 billion towards clean energy investments using an array of incentives including clean energy tax credits; tax credits for carbon capture and storage; incentives for domestic clean tech manufacturing; credits and rebates targeted primarily at low-income households; loan guarantees; and grants to states, communities, rural utilities, and nonprofit organizations.

Now that the scoping plan has been approved, California is entering into a regulatory process that will identify the policy and programmatic changes we need to meet our climate goals. Most of California's existing policies and programs pre-date the IRA and IIJA, and they will interact with federal incentives in potentially significant ways. Proceeding as if nothing has changed will undermine the effectiveness of climate programs and increase costs for Californians.

This chapter considers the implications of the IIJA and the IRA for California's climate policy design and leadership going forward. We underscore the importance of accounting for these policy interactions as California charts its next policy steps. As it navigates the regulatory process, CARB should assess and anticipate how its existing and planned policies will interact with new federal incentives. Going forward, California's climate strategy should be to amplify and leverage -- versus duplicate and dilute-- the role of federal incentives in our decarbonization efforts.

Interactions with California's GHG market

With passage of the IRA and the IIJA, the federal climate policy landscape now features many carrots (e.g. tax credits, rebates) and few sticks (e.g. the methane fee). California has similarly relied heavily on subsidies and rebates. But the California strategy has involved pairing these incentives with binding standards such as the renewable portfolio standard (RPS) and a carbon price.

Previous IEMAC reports have provided analysis of and commentary on the first-order interactions between California programs that are targeted at specific investments (e.g. funding for energy efficiency investments and binding standards such as the RPS, LCFS, ZEV standards) and the GHG cap and trade program. This report now considers the likely implications of over \$400 billion in federal spending for California's carbon market. We focus on two considerations in particular: policy complementarities and offsetting effects.

Policy complementarities: An important limitation of relying exclusively on tax credits and subsidies to meet our GHG reduction targets is that polluters can keep polluting for free. Energy sector modeling has shown that even a modest carbon price can act as a powerful complement to tax credits and subsidy programs because it directly penalizes GHG emissions (see, for example, Stock and Stuart 2021). Combining subsidies with a carbon price addresses the carbon “blind spots” in a subsidy-based regime.

The incentives embedded in the IRA are designed to increase investments in clean energy resources and accelerate electrification of buildings and transportation. IRA incentives are *not* designed to target or penalize GHG emissions directly. In the absence of carbon pricing, GHG emitters can keep polluting without penalty, no matter how carbon intensive they might be. Just as California's carbon price has compensated for blind spots in California's technology-targeted policies, the carbon price can also improve/amplify the effectiveness of federal incentives in achieving emissions reductions in the western power grid that serves California. In short, the carbon market is an essential complement to the subsidies embedded in federal programs.

Mitigating “waterbed” effects: A second concern pertains to the impact that IRA incentives will likely have on California's carbon market. IRA incentives accelerate investments in clean technologies. This will reduce demand for GHG abatement in the carbon market; and allowance prices will fall. A lower carbon price reduces the economy-wide incentives for GHG abatement at all sources covered by the cap. This can result in the so-called “waterbed effect” if emissions reductions at some sources and the resulting lower carbon price cause GHG emissions among other capped sources to increase (Perino et al. 2022). If the allowance price remains above the price floor, this shift in allowance use will displace emissions reductions that were induced by federal IRA incentives. If the allowance price falls to the auction reserve price (i.e. the price floor), then any allowances that are not sold will be moved into the cost containment reserve — leading to a delayed waterbed that would manifest when these allowances ultimately re-enter the market.

The potential for these interactions between IRA subsidies and the California carbon market further elevates the importance of allowance market reform (see chapter 1). IRA incentives will almost certainly reduce demand for GHG allowances. A weak carbon price signal will leave cost-effective abatement potential untapped, increasing the overall costs of meeting our GHG reduction goals.

Interactions with regulatory standards such as the RPS, storage mandate, and other programs

In the electricity sector, which receives most of the support provided by recent federal legislation, California has a renewable portfolio standard (RPS) that sets continuously escalating renewable energy procurement requirements for the state's load-serving entities. The state has also implemented mandates for utility-scale investments in clean technologies that will be needed to integrate high levels of renewable energy penetration (e.g. energy storage). The costs of complying with these mandates are typically recovered from California rate payers in the form of higher electricity prices.

Billions of dollars of federal incentives for clean energy investments provide an important opportunity to finance some of the costs of meeting California's clean energy goals with Federal tax dollars. Importantly, the IRA promises to be progressive distributionally (RFF, 2022). IRA incentives are funded by increasing the corporate income tax that falls most heavily on owners of capital (75%) who are most concentrated in the higher income quintile, with the remaining falling on labor (25%). Thus, if California entities use IRA tax credits to offset some of the costs of complying with California technology mandates, this will shift some of the cost recovery burden off of California utility customers at a time when affordability concerns loom large. In addition to addressing concerns about affordability, lower retail electricity prices will help accelerate the electrification of buildings and transportation.

Notably, the IRA financial incentives are designed to be effectively unbounded for two decades. Thus, when a California clean energy project takes advantage of IRA subsidies, this reduces the investment costs incurred in California, but it does not "crowd out" or displace GHG abatement investments elsewhere.

In sum, clean tech investment projects in California should take full advantage of the federal subsidies on offer. Proactive interventions and regulatory reforms will likely be required to unlock the full potential of this process. The state should identify and designate initiatives within the various agencies and local governments to ensure that project developers, utilities, and other stakeholders are taking maximal advantage of the federal programs.

Interactions with consumer subsidies

In addition to policies that mandate increased *utility-scale* investments in clean technologies, California has several incentive programs that target residential and commercial investments in clean technologies such as electric vehicles and heat pumps. There is an important design-difference between these two kinds of policies. Under technology mandates, policymakers set the target level of investment (e.g. 50% renewable electricity generation) and leave it to the market to determine the cost of hitting this target. Under subsidy/rebate programs, California policy makers set the consumer subsidy level and the market determines the quantity of investment (e.g. number of heat pumps installed).

This design difference is critical when thinking about interactions between state and federal incentives. As we note above, the IRA will lower the cost to Californians of a given renewable energy mandate. In contrast, IRA incentives can dilute the cost effectiveness of California’s consumer-targeted subsidies. Figure 1 illustrates a stylized example of how this works. The horizontal axis in the figure illustrates the quantity of heat pump installations and the vertical axis illustrates their price. The downward sloping line represents aggregate consumer demand for heat pumps.

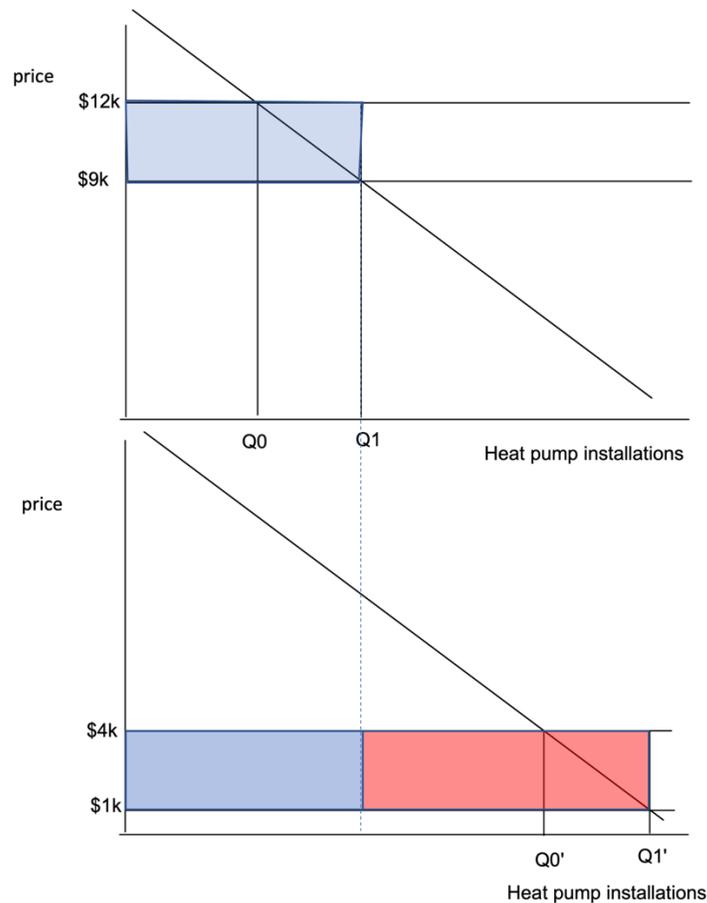


Figure 1: “Stacking” Consumer Subsidies for Heat Pump Installations

California currently offers single-family households a subsidy of \$3,000 per unit for heat pump installation (up to \$6,000 in “enhanced” regions). The top panel of the Figure 1 illustrates the effects of a \$3k California subsidy prior to the introduction of the IRA. The blue area represents the subsidy costs. The benefits are the increased level of adoption from Q0 to Q1.

With the introduction of the IRA, households are now eligible for federal heat pump subsidies up to \$8,000 (subsidies vary with household income). The lower panel illustrates the effects of stacking the California incentive on top of this federal subsidy. The federal subsidy alone can be expected to expand the installation of heat pump to Q0'. Augmenting the federal subsidy with the current California incentives will still induce additional investment (so long as the demand curve slopes down). But this comes at significant cost of paying *all* the inframarginal consumers the \$3,000 subsidy (\$6,000 in enhanced regions). For many households, this is more than they actually need to make the investment. With linear demand, the red rectangle indicates the additional subsidy expenditures required to achieve the same increase in heat pump adoption.

The true costs and benefits of this kind of “subsidy stacking” will depend on how appliance demand increases with investment cost reductions. Now that IRA subsidies for all sorts of investments (EVs, heat pumps, electric stoves, home insulation) are in play, California should re-evaluate—and possibly re-calibrate—its consumer subsidy programs in order to complement and leverage federal subsidies. In particular, California should identify and enable agencies that are well-positioned to encourage targeting and take-up of federal subsidies.

Federal subsidy targeting: The benefits generated by new investments in heat pumps or EVs or battery storage can vary significantly across locations. Federal subsidies are not calibrated to reflect these heterogeneous benefits. State agencies are in a better position to target subsidies more surgically. For example, California is embarking on a process of “strategic decommissioning” which involves identifying portions of the natural gas distribution system that will likely need upgrading or repair, and trying to convert all customers served by that portion of the system to fully electric buildings at once so the gas line can be capped off. California subsidies for home electrification investments could be stacked atop federal dollars to support this decommissioning process.

Federal subsidy take-up: Offering households financial incentives to adopt new technologies is just the first step towards accelerated technology adoption. The literature on the energy efficiency gap has documented a range of non-monetary barriers that can slow the pace of adoption (e.g. information frictions, principal-agent problems, hassle costs). Some California agencies are well positioned to implement programs that are designed to identify and reduce *non*-monetary barriers. For example, the state’s Employment Development Department is projecting that we will need to see a 15% increase in HVAC mechanics and installers to keep up with the pace of building electrification. The IRA provides \$200 million for state developed workforce development programs. California agencies could be well-positioned to leverage these funds into expanded workforce training and development.

Recommendations

A transformed federal climate policy landscape presents a valuable opportunity for California to accelerate progress on its climate goals. Proceeding as if nothing has

changed will undermine the effectiveness of climate programs and increase energy costs for Californians. It is imperative that California agencies act on this opportunity to leverage major federal investments in the clean energy transition. What form these actions will take depends on the nature of the policy interactions. We conclude with three specific recommendations pertaining to three forms of policy interactions.

1. **The GHG allowance market:** Positioning the carbon market incentivize cost-effective GHG abatement opportunities that are not directly targeted by subsidies and mandates contributes importantly to the cost effectiveness of California's overall policy portfolio. Chapter 1 discusses the reforms that will be needed for the carbon market to fulfill this role. These reforms become all the more urgent as federal incentives reduce demand for GHG allowances in California.
2. **Technology mandates:** Because the IRA is progressive distributionally, and effectively unbounded in amount over two decades, state policy makers should focus on encouraging project developers to take advantage of IRA tax credits and rebates. This will shift some of the cost recovery burden off of California utility customers at a time when affordability concerns loom large. Lower electricity prices should also accelerate the pace of electrification in the residential and commercial sectors.
3. **Consumer incentive programs:** California subsidies stacked atop federal can be less cost-effective. State-level subsidies should be designed to complement IRA programs. This could involve targeting state subsidies at investments that deliver the greatest value and/or developing strategies to reduce non-monetary barriers to adoption.

References

Perino, Grischa and Ritz, Robert A. and van Benthem, Arthur (2022). "Overlapping Climate Policies" Available at

SSRN: <https://ssrn.com/abstract=3998973> or <http://dx.doi.org/10.2139/ssrn.3998973>

Roy, Nicholas, et al. (2022) "Beyond Clean Energy: The Financial Incidence and Health Effects of the IRA". Resources for the Future Report 22-11.

Stock, James H., and Stuart Daniel (2022). [Emissions and Electricity Price Effects of a Small Carbon Tax Combined with Renewable Tax Credit Extensions](#). Working Paper.

Chapter 4. Legal Authority After 2030

Danny Cullenward

Introduction

This chapter is intended to introduce different views about the California Air Resources Board’s legal authority to implement the cap-and-trade program after 2030. The goal is to describe some of the relevant legal issues, rather than authoritatively interpret the law or endorse a particular interpretation of the law. While nothing contained in this chapter should be construed as legal advice nor be cited as any form of legal authority, the Committee hopes to surface some of the policy-relevant questions being discussed in legal circles to make them more approachable to policymakers and program stakeholders.² The Committee recommends that policymakers at CARB and in the Legislature take steps to clarify the post-2030 future of the program.

In preparing this chapter, the Committee benefited from the presentations of two legal experts who joined one of our public meetings. For their helpful insights we gratefully acknowledge Professor Cara Horowitz, the Co-Executive Director of the Emmett Institute on Climate Change and the Environment at UCLA’s School of Law, and Kevin Poloncarz, the co-chair of Covington & Burling LLP’s Environmental and Energy practice group. What follows exclusively reflects the views of the Committee, however, and does not purport to represent the views of Professor Horowitz, Mr. Poloncarz, or anyone else who provided public comments.

CARB’s legal authority to implement the cap-and-trade program depends both on the Board’s current statutory framework and a set of state constitutional issues. We begin with a review of the statutory considerations, then turn to the constitutional issues. All statutory code references (e.g., “Section 38562”) are to the California Health and Safety Code.

Explicit statutory authority

Under the provisions of [Assembly Bill 398](#) (Eduardo García, Chapter 135, Statutes of 2017), which passed the Legislature with a two-thirds supermajority vote, CARB has explicit legal authority to operate the cap-and-trade program through the end of 2030. Section 38562(c) provides that:

“The state board may adopt a regulation that establishes a system of market-based declining annual aggregate emissions limits for sources or categories of sources that emit greenhouse gases, applicable from January 1, 2012, to December 31, 2030, inclusive, that the state board determines will achieve the maximum technologically

² The Committee notes that only one of its members (Danny Cullenward) is licensed to practice law in California, which precludes the Committee’s ability to form an independent expert legal perspective. Among other omissions, this chapter does not discuss judicial standards of review nor comprehensively identify case law relevant to statutory interpretation or state constitutional matters.

feasible and cost-effective reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources. [...]”

Because CARB’s legal authority through 2030 is clear, this chapter explores (1) whether implicit statutory authority supports the post-2030 operation of the cap-and-trade program, and (2) whether the state constitution might constrain the implementation of a post-2030 program.

Based on an initial analysis, neither question appears to have an objective answer. A range of potential policy responses span what our guest speakers helpfully referred to as a “spectrum of legal risks.” Some would likely present novel legal questions. In light of this complexity, the Committee suggests that policymakers would benefit from additional, detailed legal analysis.

Implicit statutory authority

Although CARB’s explicit authority under Section 38652(c) of the Health and Safety Code extends only through 2030, this observation does not establish on its own the concern that CARB might lack legal authority under other statutory provisions. For convenience, this chapter refers to these other possible sources of statutory authority as “implicit” statutory authority, which might separately authorize the cap-and-trade program after 2030. To the best of the Committee’s knowledge, courts have not yet addressed whether any implicit post-2030 authority exists. The discussion that follows attempts to chart some possible arguments for and against the existence of such authority, which requires a close reading of complex statutory provisions.

One important argument in favor of implicit authority is that CARB already enjoys broad authority to develop “rules and regulations ... to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions” under Section 38560. Similarly, Section 38570 provides that CARB may include “market-based compliance measures” in regulations adopted under Section 38562, without limiting this authority to Section 38562(c).³ In turn, Section 38562(b) requires that certain regulations, including those adopted under Section 38560, achieve various standards “to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit[.]”⁴

Section 38562(b)’s reference to “the statewide greenhouse gas limit” suggests that the authority to adopt “market-based compliance mechanisms” may already extend to

³ Although the explicit authority for cap-and-trade in Section 38562(c) does not use this precise term, its formal statutory definition includes nearly identical language. The only difference is the use of “limitations” as opposed to “limits,” which is likely an artifact of imprecise drafting that has no plausible difference in meaning. *Compare* Health and Safety Code § 38505(k)(1) (defining “market-based compliance mechanism” to include a “system of market-based declining annual aggregate emissions limitations for sources or categories of sources that emit greenhouse gases”) *with id.* at § 38562(c) (authorizing a “system of market-based declining annual aggregate emissions limits for sources or categories of sources that emit greenhouse gases” through 2030).

⁴ Specifically, these requirements apply to regulations adopted pursuant to Part 4 and Part 5 of Division 25.5 of the Health and Safety Code, which begin with Sections 38560 and 38570, respectively.

applications in service of California’s post-2030 statutory climate goals. Evaluating whether this is the case is not entirely straightforward, however, because the broader statutory framework is ambiguous as to whether the “statewide greenhouse gas limit” refers exclusively to the 2020 emissions limit initially established by Assembly Bill 32 or more generally to the legislatively codified targets for 2020, 2030, and 2045 across Division 25.5 of the Health and Safety Code.⁵

If the phrase “statewide greenhouse gas limit” encompasses the 2045 statutory direction found in Section 38562.2(c), then an argument can be made that a post-2030 “market-based compliance mechanism” — such as the cap-and-trade program — is also authorized under a combination of Sections 38560, 38562(b), and 38570.⁶ Such an argument might also find support in Section 38562(g), which authorizes CARB to “revise regulations adopted pursuant to [Section 38562] and adopt additional regulations to further the provisions of [Division 25.5].” Because Assembly Bill 1279 (Stat. 2022, Ch. 337) codified 2045 climate targets in Section 38652.2, which is part of Division 25.5, policies that help implement the 2045 targets would arguably “further the provisions” of Division 25.5 as Section 38562(g) contemplates.

Another potential argument in support of implicit authority concerns Section 38551, which provides that “the greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed” and that the Legislature intends that the limit “continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020.” In effect, this provision indicates that the 2020 emissions limit is intended to be perpetual and to deepen over time, although the precise relationship between the emission reductions to be “continue[d]” after 2020 and the legislative targets subsequently codified for 2030 and 2045 may be unclear.⁷ If the cap-and-trade program is necessary to support the ongoing maintenance of the 2020 emissions limit, then perhaps Section 38551 provides authority that extends beyond 2020; however, if that authority is only supposed to support the 2020 emissions limit,

⁵ The statutory framework is arguably not a model of clear draftsmanship on this point, as emission reduction targets for 2020, 2030, and 2045 are codified with distinct language and in different locations across Division 25.5 of the Health and Safety Code. *Compare* Health and Safety Code § 38550 (defining a “statewide greenhouse gas emissions limit” for 2020) (added by Assembly Bill 32 (Stat. 2006, Ch. 488)) *with id.* at § 38566 (requiring “rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas reductions authorized by [Division 25.5]” that reduce emissions to “at least 40 percent below the [2020] statewide greenhouse gas emissions limit” by 2030) (added by Senate Bill 32 (Stat. 2016, Ch. 249)) *and id.* at § 38562.2(c) (declaring that it is the “policy of the state” to achieve net-zero emissions by 2045 and to reduce 2045 emissions to “at least 85 percent below the [2020] statewide greenhouse gas emissions limit established pursuant to Section 38550”) (added by Assembly Bill 1279 (Stat. 2022, Ch. 337)).

⁶ As discussed below, this argument also anticipates concerns about Proposition 26 because Assembly Bill 398 re-authorized Section 38562 with a two-thirds supermajority vote, which suggests that any implicit authority in Section 38562 would be insulated from a Proposition 26 legal challenge.

⁷ See discussion *supra* note 4 and accompanying text.

then there could be additional legal risks if the program's emissions budgets are designed around other policy goals that do not directly modify the 2020 emissions limit.

Although these and other arguments in favor of implicit authority can be offered, the lack of explicit post-2030 authority for the cap-and-trade program is worth considering in light of potential legal challenges. This is particularly relevant because of the difference in how the Legislature granted authority to CARB with respect to market-based compliance mechanisms in Section 38562(c) and the broader authorities delegated to pursue non-market measures in other provisions in Assembly Bill 32 and subsequent legislation. Simply put, the only explicit authority for the cap-and-trade program is found in Section 38562(c), where it is time-delimited — originally with an expiration at the end of 2020 pursuant to Assembly Bill 32, and now extended through 2030 pursuant to Assembly Bill 398. In contrast, CARB's other climate policy authorities under Assembly Bill 32 and subsequent legislation are delegated without temporal limitation. Those authorities also include provisions like Section 38551 that affirmatively indicate that its statutory targets and non-market authorities do not automatically expire.

Based on this pattern, a reviewing court might infer that the Legislature intended to differentiate the duration of the authority it delegated to CARB to implement the cap-and-trade program under Section 38562(c), and thus conclude that implicit theories of legal authority are not applicable or persuasive. That the Legislature already acted once to extend the program's authority via Assembly Bill 398 could also confirm a skeptic's concerns, as it would have been a simple matter of drafting to provide a perpetual grant of authority instead of the time-delimited explicit extension through the end of 2030 that was chosen.

State constitutional considerations

In addition to questions about explicit and implicit statutory authority, state constitutional considerations also bear on the operation of a post-2030 cap-and-trade program. The primary issue is whether a given legal authority is considered a "tax" or something else, with two separate legal regimes controlling the answer depending on when the authorizing statute became law. In both cases, authorities deemed "taxes" require a two-thirds supermajority vote in the legislature, whereas other matters can generally be authorized by a simple majority.

The two legal regimes originate with citizen ballot initiatives, Proposition 13 in 1978 and Proposition 26 in 2010. Both initiatives amended the state constitution to require a two-thirds supermajority legislative vote for new taxes, as codified in Article XIII A § 3 of the California Constitution. Because Proposition 13 did not define the key term "tax,"

however, a long line of state court cases have interpreted this issue and identified a number of exemptions.⁸

Partly in response to judicial exemptions to Proposition 13, Proposition 26 added Article XIII A § 3(b), which defines a “tax” as “any levy, charge, or exaction of any kind imposed by the State,” with only five limited exemptions. Article XIII A § 3(a) indicates that a two-thirds supermajority vote is triggered whenever “[a]ny change in state statute ... results in any taxpayer paying a higher tax.” In addition, Article XIII A § 3(d) provides that:

“The State bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor’s burdens on, or benefits received from, the governmental activity.”

A statutory provision is subject to analysis under the newer terms of Proposition 26 if it was passed on or after January 1, 2010, whereas statutes passed earlier than this cut-off date and after Proposition 13 took effect in the late 1970s are subject to the terms of Proposition 13. As a result, authority from 2006’s Assembly Bill 32 is subject to the considerations of Proposition 13, whereas all of the authority from major climate legislation passed since 2010 — including [Senate Bill 32](#) (Pavley, Chapter 249, Statutes of 2016) and Assembly Bills 398 and 1279 (Muratsuchi, Chapter 337, Statutes of 2022) — are subject to analysis under Proposition 26.

Implications for existing implicit authority

Because Assembly Bill 398 passed with a supermajority vote, any of the authorities it provides would appear valid under the current requirements of Article XIII A § 3 of the California Constitution, whether or not they constitute a “tax.” This could potentially include any implicit legal authority derived from Section 38562, which was reauthorized in Assembly Bill 398.⁹

In contrast, any implicit authority that derives from Assembly Bill 32 would be subject to a Proposition 13 analysis to determine whether it constitutes an impermissible “tax.” In fact, CARB’s decision to auction allowances as part of its cap-and-trade program was challenged as a violation of Proposition 13 because the program’s original authorizing statute, Assembly Bill 32, is the product of a simple majority vote. In *California Chamber of Commerce v. CARB*, a California Court of Appeal panel decided that the auction of cap-and-trade allowances is neither a “tax” nor a “fee,” as those terms are understood in

⁸ Andy Coghlan and Danny Cullenward, *State Constitutional Limitations on the Future of California’s Carbon Market*, 37 Energy Law Journal 219, 224-31 (2016) (describing the history of Propositions 13 and 26, as well as their application to pre- and post-2010 statutory authority).

⁹ See discussion *supra* note 5 and accompanying text.

the context of Proposition 13, and upheld CARB's allowance auctions as a "voluntary purchase of a valuable commodity."¹⁰

A complete discussion of potential state constitutional constraints under pre-2010 statutory authority is beyond the scope of this chapter and could involve significant policy consequences and complicated case law that are not fully addressed here.

Implications for new explicit authority

If policymakers decide that it is either necessary or preferable to create new legislative authority, they will also need to consider whether to do so via a simple majority or two-thirds supermajority legislative vote. Because Proposition 26's requirements are relatively recent and its specific application to the cap-and-trade program could easily raise legal questions of first impression, the necessary analysis is complicated and goes well beyond the summary offered here.

One important caveat is in order. While precedent from cases that decided matters under Proposition 13 might inform future litigation, Proposition 26 fundamentally changed the older Article XIII A § 3 text. Specifically, it added a broad and explicit definition of the key term "tax" (paragraph (b)); enumerated a limited list of exemptions (paragraphs (b)(1) through (b)(5)); and required the government to bear the burden of proof in demonstrating that non-tax measures meet substantive standards (paragraph (d)). Because none of these elements were present under Proposition 13, policymakers should not rely on Proposition 13 case law as a straightforward proxy for how similar issues are likely to be resolved under Proposition 26.

The only simple thing that can be said is that new legislation passed by a two-thirds supermajority vote would eliminate legal risks associated with Proposition 26. In contrast, new legislation that is authorized on a simple majority basis would likely raise novel legal questions and/or require substantial policy changes to the current cap-and-trade program.

Simple majority legislation would need to authorize activity that is not a "tax" under Article XIII A § 3(b) of the California Constitution, such that the government could meet its burden of proof with respect to the requirements of § 3(d). A number of such ideas have been discussed, although it bears repeating that the legal risks associated with

¹⁰ *California Chamber of Commerce v. CARB* (2017) 10 Cal.App.5th 604, 614; see also *id.* at 652-72 (Justice Hull's dissenting opinion). In the interest of full disclosure, please note that IEMAC Chair Dallas Burtraw filed an amicus brief in support of CARB and Professor Horowitz represented another amicus party in support of CARB in this matter. For additional context, prior to the *California Chamber of Commerce* decision, much of the legal discussion related to CARB's pre-Assembly Bill 398 authority concerned the permissibility of "regulatory fees" under a different Proposition 13 case known as *Sinclair Paint. Sinclair Paint Co. v. State Board of Equalization* (1997) 15 Cal.4th 866; see also Cara Horowitz et al. (2012), *Spending California's Auction Revenue: Understanding the Sinclair Paint Risk Spectrum*, UCLA School of Law.

these concepts are nuanced and could present legal questions of first impression. For example:

- Some legal scholars have suggested that cap-and-trade allowances are similar to access charges or use charges associated with the use of state property, a line of thinking that might justify one of the enumerated Proposition 26 exemptions.¹¹
- A carbon price imposed on emitters might be justified under another Proposition 26 exemption for penalties that punish legal violations.¹²
- Professor Horowitz also suggested that policymakers could consider freely allocating all allowances, or allocate all allowances to a third-party entity that auctions the allowances and manages the associated revenues, either of which might fall outside Proposition 26's definition of a "tax."¹³ Separate from any legal considerations, these constructs would eliminate revenue coming into the Greenhouse Gas Reduction Fund and raise substantial policy considerations about the distribution of program costs and benefits.
- The *California Chamber of Commerce* decision upholding cap-and-trade allowance auctions under Proposition 13 might support a related exemption to Proposition 26's definition of "tax" in which the payor receives a "specific benefit ... or privilege," but would require additional analysis to determine if private allowance values "exceed

¹¹ California Constitution, Article XIII A § 3(b)(4) (exempting from the definition of "tax" any "charge imposed for entrance to or use of state property, or the purchase, rental, or lease of state property, except charges governed by Section 15 of Article XI."); Dave Owen, *Auctions, Taxes, and Air*, 65 UCLA Law Review Discourse 64 (2017) (arguing that cap-and-trade allowance auctions should be considered regulatory charges for the use of public resources, rather than taxes); *but see Zolly v. City of Oakland* (2022) 13 Cal.5th 780, 784 (finding that the City of Oakland failed to show that fees charged to waste haulers for the use of certain public resources satisfied a Proposition 26 exemption related to the use of government property). Although *Zolly* concerned the authority of a local government to impose taxes under Article XIII C of the California Constitution, the relevant provisions are "similar, though not identical" to those under Article XIII A. 13 Cal.5th at 786; *compare* California Constitution, Article XIII C § 1(e)(4) ("A charge imposed for entrance to or use of local government property, or the purchase, rental, or lease of local government property.") *with id.* at Article XIII A § 3(b)(4) ("A charge imposed for entrance to or use of state property, or the purchase, rental, or lease of state property, except charges governed by Section 15 of Article XI.").

¹² Cullenward and Coghlan, *supra* note 7 at 252-54 (describing a legal theory for justifying a carbon price as a penalty under Article XIII A § 3(b)(5)). In a special legislative session called by Governor Newsom in November 2022, Senator Nancy Skinner introduced a bill, SB1X-2, that would similarly impose a penalty on oil refiners whose profits exceed certain margins. The Office of Legislative Counsel designated the bill as requiring only a simple majority vote, which is not a dispositive legal authority but nevertheless indicates a possible legislative strategy.

¹³ See *also* Cullenward and Coghlan, *supra* note 7 at 249-52 (discussing similar ideas).

the reasonable costs to the State” associated with “conferring the benefit or granting the privilege” to the successful bidder.¹⁴

Conclusion

Analyzing whether the California Air Resources Board has implicit authority to continue the cap-and-trade program after 2030 requires a careful reading of complex statutory language and may also be subject to nuanced constitutional considerations. Proposition 13 created and Proposition 26 modified Article XIII A § 3 of the California Constitution, which governs whether statutory authority constitutes a “tax” and therefore requires a two-thirds legislative vote. Statutes that were passed prior to 2010 are subject to analysis under the older Proposition 13 constitutional text and case law, whereas statutes passed in 2010 or later are subject to analysis under the current text of the state constitution under Proposition 26. Because the relevant constitutional text was substantially changed by the passage of Proposition 26, it is important to carefully consider the current text and not rely exclusively on case law that interprets the older, substantially more flexible standards under Proposition 13.

If policymakers determine that new statutory authority would be necessary or otherwise useful to resolve potential legal uncertainty — as they did before, with the passage of Assembly Bill 398 in 2017 — then they will need to determine whether such authority requires a simple majority or two-thirds supermajority vote under the terms of Proposition 26. A supermajority vote might present political challenges but would fully resolve any legal considerations associated with Proposition 26. In contrast, various legal theories about how simple majority extensions of CARB’s explicit cap-and-trade authority might be justified under one or more of the exemptions to the state constitution’s definition of a “tax” likely would present novel legal questions that are beyond the scope of this chapter.

¹⁴ Compare *California Chamber of Commerce*, 10 Cal.App.5th at 614 (describing the allowance auctions as the “voluntary purchase of a valuable commodity” and therefore not a “tax” under the terms of Proposition 13) with California Constitution, Article XIII A § 3(b)(1) (exempting from the Proposition 26 definition of a “tax” any “charge imposed for a specific benefit conferred or privilege granted directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the State of conferring the benefit or granting the privilege to the payor.”).

Individual Committee Member Statement — Danny Cullenward

I write separately to highlight a recent and significant methodological change in CARB's statewide Greenhouse Gas Inventory (CARB 2022a), which CARB uses to track compliance with its legal obligation to reduce emissions below specified targets for 2020, 2030, and 2045. This change has significant policy implications but is not well understood. Absent further intervention from CARB, which could fully remedy the concerns identified here, the change has the practical effect of reducing climate policy ambition at a time when California should instead be accelerating its efforts.

In parallel with the development of the 2022 Scoping Plan, CARB undertook what may be the most consequential update to the Greenhouse Gas Inventory to date (CARB 2022b). Specifically, CARB determined that better data sources result in substantially lower emissions than staff had previously estimated in earlier versions of the Greenhouse Gas Inventory—almost 15 million tCO₂-equivalent per year less, or a reduction of about 3.4% relative to baseline 1990 emissions.¹⁵

Although CARB's adopted changes appear to be methodologically sound, staff decided to apply these updates to some, but not all, of the historical record.¹⁶ The most significant changes result from CARB's decision to replace relatively coarse data sources with more precise information collected under CARB's Mandatory Greenhouse Gas Reporting Regulation (MRR).¹⁷ CARB used the MRR data to estimate emissions more accurately across its entire Greenhouse Gas Inventory, which dates back to 2000. However, CARB did not update its estimate of 1990 emissions. That decision is consequential because CARB's estimate of 1990 emissions is used as the baseline against which California's statewide greenhouse gas emission reduction targets are

¹⁵ As explained further below, the primary changes reflect the adoption of CARB's MRR data, which are available at their maximum breadth of coverage beginning in 2012. By comparing the 2021 and 2022 versions of the Greenhouse Gas Inventory across the period of their overlap with the relevant MRR data (2012 through 2019), I calculate an average difference of 14.71 million tCO₂-equivalent per year. In 2014, CARB determined that baseline 1990 emissions were 431 million tCO₂-equivalent, of which total 14.71 million tCO₂-equivalent represents about 3.4%. Consistent with current CARB practice, all CO₂-equivalents mentioned here are reported using 100-year GWPs from the IPCC AR4 report.

¹⁶ Consistent with past practice, as well as the practice of the U.S. EPA and guidance from the IPCC, CARB applies its methodological changes retroactively. In other words, CARB re-estimates historical inventory data based on the latest inventory methods. The most pronounced changes in the Greenhouse Gas Inventory appear in 2012, the first year in which complete MRR data are available. However, because the Greenhouse Gas Inventory only extends back to 2000, updating these methods does not have any effect on the 1990 emissions baseline.

¹⁷ California Code of Regulations, Title 17, §§ 95100 *et seq.* The MRR data are also used to determine whether an emitter is subject to the requirements of the cap-and-trade program, and if so, its total compliance obligation.

defined, such as the Senate Bill 32 requirement to reduce emissions 40% below the 1990 emissions baseline by 2030.¹⁸

Under this bifurcated approach, greenhouse gas emissions are now reported with more accurate methods that calculate substantially lower emissions, while policy progress is measured against a baseline that was established using older methods that calculate substantially higher emissions. This approach is inconsistent and has the practical effect of reducing climate policy ambition because state law only requires a percentage reduction relative to the 1990 baseline.

An analogy illustrates this inconsistency matters. Consider what would happen if you set out to lose weight through diet and exercise and measured yourself at the start of your project. Suppose you later learned that the scale you had been using incorrectly reported you as being heavier than your true weight. It'd be a good idea to get a new scale that is more accurate, but it would obviously be an exaggeration to calculate your weight loss by comparing measurements from the new scale against your initial weight from the old scale. The better approach would be to estimate what the new scale would have reported for your initial weight and measure your progress against that updated baseline.

Similarly, CARB can mitigate the policy consequences of these changes by updating its estimate of the 1990 emissions baseline to reflect the substantial methodological updates it has already applied across the Greenhouse Gas Inventory. It already did so once in 2014, when staff concluded that a baseline update was warranted for change that is more than three times smaller than the effect of the Greenhouse Gas Inventory update.¹⁹ I encourage CARB to update its estimate of the 1990 emissions baseline to consistently reflect the new Greenhouse Gas Inventory methods and suggest that the IEMAC should consider addressing these issues in 2023.

References

CARB (2021), California Greenhouse Gas Emissions for 2000 to 2019, Trends of Emissions and Other Indicators (July 28, 2021), https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000_2019_ghg_inventory_trends_20220516.pdf

¹⁸ California Health and Safety Code § 38566 (defining the 2030 target as a 40% reduction below the “statewide greenhouse gas emissions limit”); *id.* at § 38550 (defining “the statewide greenhouse gas emissions limit” as emissions in the year 1990 and directing CARB to use “the best available scientific, technological, and economic information” to determine that level).

¹⁹ CARB’s initial estimate of 1990 emissions was 427 million tCO₂-equivalent, which staff updated in 2014 to 431 million tCO₂-equivalent to incorporate IPCC AR4 GWPs. The 2014 update increased the 1990 baseline by about 0.9%. See CARB, GHG 1990 Emissions Level & 2020 Limit, <https://ww2.arb.ca.gov/ghg-2020-limit>. For comparison, the 2022 Greenhouse Gas Inventory update reduced reported emissions by about 3.4%.

2022 Annual Report of the Independent Emissions Market Advisory Committee

CARB (2022a), California Greenhouse Gas Emissions for 2000 to 2020, Trends of Emissions and Other Indicators (Oct. 26, 2022),

https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf

CARB (2022b), California's 2000-2020 Greenhouse Gas Emissions Inventory 2022 Edition, Inventory Updates Since the 2021 Edition of the Inventory, Supplement to the Technical Support Document (Nov. 1, 2022),

https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/ghg_inventory_00-20_method_update_document.pdf