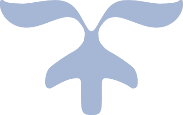


Policy Memo: Carbon Offset Program Restructuring in California



Executive Summary

This policy memo endeavors to examine the present efficacy of the Compliance Offset Program as a function of the California Air Resources Board within the encompassing Cap-and-Trade Program within the state of California. A general introduction to the Cap-And-Trade Program, the Compliance Offset Program, constituent offset protocol descriptions are given to lend background into the various types of offset projects, with particular detail given to U.S. Forest projects.

Critical examinations of various U.S. Forest offset project case studies are explored to reflect upon various academic perspectives and public opinions of the Compliance Offset Program as it has historically functioned and does so today. Discussions on program shortcomings in regard to factors of project additionality, value of rendered offset credits, emissions leakage, overall GHG emission reductions, public perception and program effects on disadvantaged communities located near participating emitters (and disproportionally negatively affected by released co-pollutants).

From here a spectrum of actionable responses are presented to address concerns raised by the case study evaluations. Some responses include redefining existing Compliance Offset Protocols to ensure greater stringency in initial parameters used within U.S. Forest offset projects to ensure a more accurate characterization of the baseline carbon capacity of the trees within a particular site to ensure additionality and the appropriate allocation of carbon offset credits. Other additive responses to concerns raised include directing the Compliance Offsets Protocol Task Force with promoting new local, community level projects to address local pollutants, providing incentives or regulation to compel offset purchasing entities to either participate in local offset projects or pay additional fees equivalent to the local air pollutants released at their facilities.

Considering elements of political expediency (remaining project lifespan, potential coalitions, detractors, existing California Air Resources Board frameworks) efforts to benefit communities of color and the impoverished are given precedent as there is a significant need to provide responsible action to promote their well-being, quality of life, and agency, and the scope of carbon offsets in California’s carbon market system must be addressed to this end.

**Subject:** Advocacy for Carbon Offset Program Restructuring within California

**To:** Governor Gavin Newsom

**From:** David H. Bongiorno

*Introduction*

This memo presents the policy rationale for restructuring the present role of carbon dioxide reducing initiatives (“carbon offsets”) within the scope of alternative actions available to complying entities under the current Californian Cap-and-Trade Program or future iterations.

Since launching in 2013 under the Global Warming Solutions Act the program has demonstrated success a feasible and flexible framework to reduce carbon dioxide emissions and scale with partnering regional entities to form engaging markets of heterogenous cap-and-trade systems that presently includes Quebec through the Western Climate Initiative (WCI),1 and possibly in the near future neighboring Washington state’s burgeoning system.2 Various positive effects of the program include a recorded 32.6% drop of per capita greenhouse gas (GHG) emissions between 2001 and 2020 (a decrease from a peak of 13.8 metric tons per person to 9.3 metric tons per person).3 Over $9.3 billion in cumulative auction proceeds from 2014 to 2022 (which are deposited to the Greenhouse Gas Reduction Fund, GGRF, before being available for appropriated dispersal) have funded various California Climate Investments programs supporting local environmental, economic, and public health benefits – in 2022 approximately 19,500 new projects (as identified and organized by the California Air Resources Board, CARB, and other administering agencies) were implemented by such programs and are expected to mitigate 10.4 million metric tons of carbon dioxide equivalent emissions (MMTCO2e).4 Furthermore, commendable work has been done to utilize cap-and-invest auction proceeds to support projects that benefit the state’s disadvantaged communities and low‐income communities and households (collectively called “priority populations”), and $6.7 billion in cumulative funding has gone towards projects benefiting priority populations (or 73% of the total $9.3 billion, exceeding the statutory 35% of California Climate Investment funds as mandated by SB 535 and AB 1550).5

However, as shall be discussed the Compliance Offset Program under the Cap-and-Trade Program must be improved to account for the lackluster results of implemented carbon offsets. Results which not only raise scrutiny of their greenhouse gas (GHG) emissions reduction efficacy, but also concern over the effect carbon offsets have in local, vulnerable communities (often communities of color and the impoverished). In response to such effects, several actionable policy options are presented to either amend the current Cap-and-Trade program (which is in effect until 2030 as directed by AB 398), or subsequent programs.

*Structure of Present Carbon Offset Program*

According to the CARB program page, issued compliance carbon offset credits allow entitles covered (either mandated or opt-in) within the Cap-and-Trade Program to accomplish a portion of their overall compliance obligation (“the quantitative usage limit”) during a given period; mandated entities are major GHG-emitting sources that include: electricity generators (both originating in California and imported) and large stationary sources (intensive production and manufacturing facilities such cement factories, oil and gas refineries, food processing plants, etc.) that emit more than 25,000 MMTCO2e annually. Mandatory coverage expanded in 2015 to include fuel distributors and providers.6 The quantitative usage limit of permissible compliance entities can claim via the offset credits was initially set to 8% of total emissions from program inception through 2020, drops to 4% during 2021 to 2025, and rises to 6% during 2026-2030, stemming from an inference of higher quality offsets becoming viable at such time. Additionally, from 2021 onwards a maximum of half the quantitative usage limit can be attributed to carbon offset projects that “do not provide direct environmental benefits to the state”.7

Compliant entities have a bevy of available categories and corresponding guidelines and requirements for a carbon offset project. The categories are presently designated by six Compliance Offset Protocols. The entity conducting the project (the Offset Project Operator, OPO) documents the project with an approved Offset Project Registry (OPR) for record submission. From there the OPR reviews the project and lists general information about it to a public website at which point the OPO must closely report and verify the GHG emissions reductions or removal augmentations achieved by the project. Registry offset credits can be issued by the OPR once the project satisfies basic overall Cap-and-Trade-Program requirements at which point the OPO can request CARB review of the project to receive CARB offset credits.8

As a brief introduction, the various Compliance Offset Protocols include:

Livestock Projects: Offsets within this protocol are concerned with the reporting and reduction in GHG emissions (primarily methane) emanating from anaerobic manure treatment within dairy cattle and swine farms via improved biogas control systems (BCS) and digesters.9

Mine Methane Capture (MMC): Offsets within this protocol came into effect by CARB in 2014, they are concerned with GHG emission reporting and reductions via the containment and elimination of methane due to operations in active and abandoned coal and trona mines (both surface and underground).10

Ozone Depleting Substances (ODS): Offsets within this protocol are concerned with the reporting and reduction of GHG emissions via the domestic destruction of high global warming potential (GWP), ozone depleting substances otherwise left to enter the atmosphere; the substances include foams (building and appliance insulation) and refrigerants from industrial, commercial, or residential equipment, systems, appliances, or stockpiles originating from U.S. supplies.11

As a note, each offset project within the Livestock, MMC, and ODS protocols must submit to annual, independent verification by an ARB-accredited verification body.

Rice Cultivation: Offsets within this protocol are concerned with the reporting and reduction of GHG emissions (primarily methane) from flooded rice fields that spur anaerobic decomposition and in turn methane release. This protocol mandates the utilization of the DeNitrification-DeComposition (DNDC) biogeochemical process model in the reporting of nitrous oxide and methane changes due to eligible project practices. Eligible projects must be located in major growing regions in California and the Mid-South where “the DNDC model has been calibrated with empirical data”; eligible practices that apply to California are “1) replacing wet seeding with dry seeding and 2) early drainage at the end of growing season; and the eligible practices for the Mid-South: 1) intermittent flooding and 2) early drainage at the end of growing season.”12

Urban Forest: Offsets within this protocol are concerned with GHG reductions via the coordinated tree planting and maintenance activities that permanently increase carbon storage of a domestic U.S. urban forest within a municipality, an educational campus, or Tribal lands (so long as waiver of sovereign immunity requirements of section 95975(I) of the Cap-and-Trade-Program. Utilities can also claim trees replacing those cut down for the purpose of transmission or distribution line clearance are eligible for offset credits. The scope of a given project is less than 100 acres of forested tracts, its crediting period (beginning upon completion of tree planting and commencement of standard maintenance) has an initial duration of 25 years before the OPO can request for offset renewal per the requirements in the Cap-and-Trade Program. The CARB website offers additional resources to help OPOs and Authorized Project Designees (APDs) such as a size estimation spreadsheet for a variety of tree species and the Center for Urban Forest Research Tree Carbon Calculator (CTCC) to approximate the amount of carbon stored in a tree and the amount it sequesters annually (however I could not access this tool when I attempted to do so in my own research).13

U.S. Forest: Offsets within this protocol are concerned with long-term GHG reductions via the coordinated, transparent activities that contain carbon within forests located in the United States and regions of Alaska (U.S. Territories and Hawaii are presently disqualified project sites).14 The protocol also provides risk assessment of the reversal of carbon sequestration should the project be reversed lending credence to the additionality metric justifying the offset program (just as all rendered offset credits are required to be “real, permanent, quantifiable, verifiable, enforceable and additional” per AB 32). The project variants break down into improved forest management, avoided conversion, and reforestation efforts, which in turn constitutes a variety of activities including thinning diseased trees, increasing the time between harvests, managing brush, etc. Present estimations and future behavior of carbon within existing project domain trees are derived stochastically from CARB-approved methods and compared to a “business-as-usual” scenario (the baseline of neighboring forested areas subject to precedent legal constraints such as the Endangered Species Act and conventional or common harvesting and growing practices) to ensure accurate long-term modeling and determine the amount of carbon offsets earned (n.b. harvesting is accounted for by annually updating the inventory of trees in a project area). This Protocol also attempts to address shifted tree harvesting in other areas (activity-shifting leakage set at 20%) and associated change in market demand for wood products due to additional harvesting conducted outside of the project area (market-shifting leakage set at 80%). From these Protocol facets the basic formula for deriving the number of offset credits rendered is equivalent to (Actual stored carbon – Baseline stored carbon) – Market-shifting leakage – Activity-shifting leakage. Beyond the first year of the project offset credits only consider annual tree growth, harvest, and leakage. Lastly project monitoring, reporting, and verification activities are to be conducted for 100 years after the last offset credits have been issued.15

*Case Studies & Editorials*

Ideal carbon offset programs and their constituent, approved projects encompass requirements of additionality, enduring effects, and airtight accounting of leakage effects. Ideally, they provide an alternative method with fair and transparent regulations with logical metrics for success and adherence and ultimately guarantee the reduction of GHGs. Not all projects have done so as an idea must ultimately translate to reality during implementation where unexpected program inadequacies can become evident, unexpected outcomes arise, and new issues and questions about program impact on both the environment and human lives come into focus.

Additionality & Leakage: A 2023 paper by N. Randazzo et al. found the assessment methods of CARB in the definition of baseline carbon stocks within Improved Forest Management (IFM) projects to be insufficient and compromises their legitimate claims to additionality.16

As mentioned above baseline carbon stock for a given project is informed by common harvesting and management practices. In the case that a baseline has an above average initial carbon stock the baseline is set by the “common practice stocking value”. This value is taken as the average carbon in aboveground live (AGL) trees in privately owned forests classified as the conforming “assessment area” (vegetation community, e.g. mixed conifer) within the IFM project’s “supersection” (a geographical area, e.g. the Southern Cascades) according to forest survey data from the U.S. Forest Service’s Forest Inventory and Analysis (FIA).

The researchers point towards excessively broad definitions of assessment areas within supersections that contain a vast diversity of forest types each with unique rates of carbon sequestration and theoretical maximum stock. The risk is that a cursory understanding of these assessment areas leads to an excess of issued initial carbon offset credits generated not because of good, initial baseline conditions, but due to the innate ecological conditions driving the carbon density of a given project area. At worst this possibility can incentivize an adverse selection of projects that still garner carbon offset credits without altering the harvesting and growth practices of a given region.

The researchers suggest an analysis method that uses ecological gradients corresponding to California’s geography to characterize tree species composition, allowing for the most ecologically similar FIA sites to be used in reference for potential project sites when calculating a “new common practices” estimate for the baseline. Moreover, they found that, “The establishment of a large majority of upfront-credited Southern Cascades Mixed Conifer IFM projects in forests with ecological characteristics associated with greater carbon sequestration than the official common practices corroborated claims of adverse selection and is significant overestimate of additionality.”

Similar sentiments have been echoed by other researchers complaining that the Carbon U.S. Forrest Protocol should be reexamined for IFM projects to better ensure project additionality. For example, S. R. Coffield et al. utilized remote sensing data to argue that “carbon accumulation rates have not yet increased on lands that enroll as offset projects, relative to their pre-enrollment levels; and harvest rates have not decreased on most project lands since offset project initiation.”17

On Leakage, an open 2019 policy brief by B. Haya argued that CARB’s estimation of their leakage rates used in carbon offset credit valuing should be amended. For projects within the U.S. Forest Compliance Offset Protocol (which have generated 80% of cumulatively generated offset credits), Haya asserts the activity-shifting leakage rate of 20% should be changed to 80% to better reflect observed historic domestic reductions in federal timber productions seen historically. 18

Public Perspectives & Environmental Justice: Some may argue that carbon offset projects are not an applicable avenue to address challenges in environmental justice and equity,19 that offset projects are beneficial if they are implemented in California, another state, or another country, so long as the equivalent number of GHG emissions credited have been successfully removed or sequestered. While there is merit to this based on the design of the Cap-and-Trade system and its primary focus on GHG reductions, the *effects* of the system are still palpable to the local inhabitants of communities that still live near large polluting facilities. The public suffering and frustration with the Cap-and-Trade Program can be found in the accounts of mothers living in the shadows of vapor clouds of nearby refineries covered under the Cap-and-Trade Program whose children are born with asthma or family members experience nosebleeds as was the case for Michelle Muñoz of Wilmington.20

Likewise outrage from clean-air activists was expressed at the Compliance Offset Program provisions that allowed an estimated $3.9 million in offset credits from Eddie Ranch (an IFM offset project) to still be issued to PBF Energy even after a 2018 wildfire decimated the site and eliminated its carbon carrying capacity, while the company’s gas refineries in Torrance and Martinez are still able to emit GHGs. The redundant offsets from the Eddie Ranch had to be restored by drawing from a state insurance pool of funds designed to buffer the effects of unexpected fires and owner bankruptcies (the CARB was admonished in an open letter to reconfigure how landowners in California contribute to the fund to reflect growing concerns of offset projects located in increasingly fire-prone areas to no avail).

Such concerns as with academic and public complaints about the offset program’s ability to combat local air pollution, ensure the proper value of offsets, and the designation of projects satisfying additionality have been often disregarded by CARB. Many actors are invested in the offset program as Evan Halper of the Los Angles Times notes, “Land trusts, conservation groups and American Indian tribes across the country are heavily invested… [s]ome $2 billion flowed from offset credits over the last eight years, funding educational programs, opioid addiction clinics and cash payments to tribal members, among other things.” The available funds put such groups into conflicting dilemmas in which personally championed conservation goals or the means of living are made more attainable by interacting with an ineffective offset program.

The Passamaquoddy tribe in Maine grappled internally for two years before accepting an offer of millions in offset credits by Chevron which would be used to compensate for the GHG emissions of their refineries in Richmond and El Segundo. An attorney for the tribe stated “It was the right move for a socially disadvantaged community suffering our own environmental injustice on a daily basis… it is a little bit of an indirect attack to say we are contributors to pollution at a Chevron plant in California. We are not. We have been victims of environmental abuse from all sides, and we are fashioning a way to survive and ensure our existence in this world.”21

As previously mentioned, the effects of the Cap-and-Trade program have disproportionally and adversely affected Black and Brown communities and those below the federal poverty line. One study by L. Cushing et al. examining the effects of the program after the initiation of carbon trading in California (spanning January 1, 2013 - December 31, 2015) observed regulated GHG emitting facilities within the program are primarily located in disadvantaged neighborhoods. Results showed the relative difference of neighborhoods (as represented by 2010 U.S. census blocks groups) living within 2.5 miles of one of the 19 different Cap-and-Trade participating oil and gas plants examined in the study compared to those living further than 2.5 miles was 34% higher for Black and Brown residents, 23% higher for poor residents, and 64% higher in residents with low education.

The researchers also noted that co-pollutant emissions (such as particulate matter (PM2.5), nitrogen oxides, sulfur oxides, volatile organic compounds (VOCs), and air toxics) were correlated across facilities with GHG emissions; some co-pollutant emissions were more sensitive to emissions in various sectors than others (e.g. PM2.5and public service facilities, nitrogen oxides and metal & machinery manufacturing, sulfur oxides and refineries, etc.). Additionally, the researchers found that in this initial period over 4% of the total compliance obligation period was met by carbon offset credits the majority of which (75.6%) came from out-of-state projects, and that facilities operated by entities using offsets emitted “significantly higher levels of GHGs than those owned by companies that did not use offsets.” Perhaps most troubling is the finding that 52% of regulated facilities reported higher annual average local (in-state) GHG emissions, despite total emissions not exceeding the program cap for the initial trading period.

The study concludes with several sensible hypothetical options to harmonize local air-quality goals with GHG emissions reductions such as tying the price of carbon credits to in proportion to regional pollution for prospective entities this would further incentivize immediate and more significant reductions in unequally impacted communities. Another option would be to require or motivate entities to partake in other offset projects that would result in GHG emission reduction and local air quality improvement (such as railyard electrification, financing retrofits, etc.) that have a pressing need in local germane communities.22

*Solution Background – Existing CARB Framework*

Such local environmental effects and expansive capabilities are under the purview of CARB. As previously alluded to AB 398 directed CARB in July 2017 to enforce a cap of one half of the quantitative usage limit permitted to carbon offset projects that do not provide direct environmental benefits in the state (DEBS).23AB 398 further clarifies the DEBS stipulation as “the reduction or avoidance of emissions of any air pollutant in the state or the reduction or avoidance of any pollutant that could have an adverse impact on waters of the state”. There are a few sections of AB 398 that may provide a legislative jumping off point for expansion of the Compliance Offset Program (and the Cap-And-Trade program at large) to better address DEBS and target co-pollutants in affected communities: Section §95989(a) outlines projects in California are inherently beneficial to the state and justifies their DEBS contribution according to the local pollutants mitigated by each particular Compliance Offset Protocol, §95989(b) similarly outlines projects for beyond California, and Section §38591.1 compels CARB to establish a Compliance Offsets Protocol Task Force. The Task Force guides CARB in establishing new offset protocols for the Cap-and-Trade Program with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions.24

*Possible Solutions for Improvement*

Given the discussion presented in the memo thus far concerning the Compliance Offset Program under the Cap-and-Trade Program in California, some hypothetical solutions can be suggested for incorporation into the existing program before its expiration in 2030, or provide possible augmentations to future iterations of a similar market based GHG emissions reduction scheme.

The first apparent item to be addressed is the higher need for a greater degree of scrutiny when it comes to the additionality benchmark for offset projects under the U.S. Forrest Protocol (as they constitute the majority of offset projects undertaken within the Californian Cap-and-Trade Program). The present need for better determination of the starting point of projects in regards to their baseline stock of trees (and thus capacity to store carbon) should be updated to account for the diverse set of ecological conditions rather than take a gross average of an assessment area within massive supersections. This would have the effect of mitigating the emphasis of common-practices in valuing the baseline capacity. This would have the effect of lowering the attributed carbon emission offset credits GHG emitting entities compliant in the program can achieve in the initial phase of an IFM project. This may prove more costly for the purchasing entities (and hypothetical land-owning parties, conservation groups, etc. receiving the transacted funds), but this would bolster the additionality integrity of the U.S. Forrest Protocol, help direct forest management actions that more efficiently sequester, and direct attention towards other offset projects with demonstrable needs for intervention. This could be done via the methods of the literature presented in the prior sections in which a more comprehensive profiling of the trees as they contextually behave in a given project area to determine their carbon sequestering capabilities. This along with updated practices to the timber economy could over the lifetime of the program provide a better model of activity-shifting leakage.

The second item to be addressed would be the local air pollutant and environmental justice impacts of the Compliance Offset Program on at-risk communities within California. The legislative mandate, and existing flexible framework within CARB to ensure and promote projects that champion DEBS has been laid out. Furthermore, the moral obligations to safeguard the health and safety of disadvantaged communities must be addressed. If not through carbon offsets, then perhaps greater direction of funding from the carbon auction proceeds can be used. However, within the framework of this discussion, the Compliance Offsets Protocol Task Force should be charged with both reexamining existing Protocols for areas in which local air and water pollutants can be mitigated. The development of new Protocols and programs within them should seek new on-the-ground initiatives that can benefit Californian Black and Brown communities and the less affluent. Such initiatives could include home appliance electrification, heat-pump installation, community roof-top solar, weatherization improvements, funding of research into other GHG and local air-pollutant abating technologies. Furthermore, the CARB could be altered to incentivize entities that produce such co-pollutants by bolstering the value local offset projects that would have a demonstrable impact on local community health; the punitive version of this could look like attaching the associated health cost of emitted co-pollutants (particulate matter, sulfur oxides, nitrogen oxides, etc.) onto the emitting entity directly onto a purchased carbon offset or instead all at once over a given compliance period. Overall partnership among the Californian Environmental Justice Advisory Committee, California Climate Investments, CARB, environmental justice organizations such as Communities for a Better Environment, and the California Department of Public Health should be sought to better align the GHG reduction goals of the Cap-And-Trade-Program and overall local pollutant reduction to promote community protection and public well-being.

*Solution Presentation & Conclusion*

It is 2023, there are still seven years to make strides within the Cap-and-Trade-Program before its expiration in 2030, or at the very least make strong considerations for predecessor carbon market based programs. Considering the continuum of options presented to address the two main categories of improvement within the Compliance Offset Program under the Cap-and-Trade Program I would suggest the governor seeks a version of both sets of options as they are not mutually exclusive. However if political will only allows for the pursuit towards one goal I would suggest that the governor seeks to build a policy agenda that promotes at the very least the reexamination of existing and development of appropriate Compliance Offset Protocols to better address the pressing health and safety needs of disadvantage communities in the face of released local air and water pollutants as described above.

This measure would provide immediate benefits to your constituents, likely increase their support of and engagement with the Cap-and-Trade-Program, and the market would be allowed to further explore and develop GHG and local pollutant monitoring and abatement technologies and practices. A combination of levies on local pollutants from large emitters and the exploration of effective local offset programs could be explored during the next obligation period when the quantitative usage limit is set to rise again to 6% during 2026-2030. Why not use that time and that allowance to explore bold, new directions? This period could be used to demonstrate to the most vulnerable Californians that the plans for a greener future will and must include them.

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