CalEPA
California Environmental Protection Agency

CALIFORNIA AIR RESOURCES BOARD

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for Environmental Protection

Mary D. Nichols
Chair- California Air Resources Board

June 13, 2019

The Honorable Bob Wieckowski
Chair, Senate Budget and Fiscal Review Committee No. 2
State Capitol, Room 4085
Sacramento, California 95814

Dear Senator Wieckowski:

Thank you for your letter of May 8, 2019. We continue to appreciate the shared efforts of the Legislature and the Administration in developing and implementing programs – including the Cap-and-Trade Program – to achieve California's greenhouse gas (GHG) emission reduction targets and ambitious climate goals.

Your letter raises the important topic of the rigor of the Compliance Offset Protocol U.S. Forest Projects (Forest Protocol) and its conformance with statutory and regulatory requirements. We take these issues very seriously.

The compliance offset program is an important feature of the State's Cap-and-Trade Program. As you know, there are limits established in the regulation as well as in statute limiting the amount of offsets that can be used towards compliance, and offsets can only be created using California Air Resources Board (CARB) approved protocols. The Forest Protocol is one of six compliance offset protocols approved by CARB in order to incentivize emissions reductions or sequestration in sectors that are not covered by the program, provide cost-containment, and result in other co-benefits. Each protocol was developed through a robust public process over years

prior to adoption.[1] The issue of conformance with statutory and regulatory requirements was the subject of a lawsuit when the Cap-and-Trade Program was first implemented. CARB prevailed, successfully demonstrating that the offset program and its protocols conform to statutory and regulatory requirements.[2]

CARB has reviewed the policy brief[3] by the UC Berkeley research fellow referenced in your letter. The policy brief contains errors and misunderstandings of the Forest Protocol related to how leakage is addressed and how offset crediting occurs. CARB has made available a detailed review[4] of assertions outlined in the policy brief; the findings are summarized below.

The two specific errors contained in the brief lead to inaccurate conclusions about the Forest Protocol. First, the policy brief asserts that crediting in the Forest Protocol assumes expected reductions over many decades, stating that the issuance of offsets is "front loaded" while the actual sequestration of carbon in the forest occurs over future decades. That is not correct. The crediting in the Forest Protocol is based on verified performance to date,[5] not expected performance in the future. Second, the policy brief relies on two studies to assert that the Forest Protocol does not appropriately account for leakage. Leakage occurs when a reduction in timber

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[1] *See* Cap-and-Trade Regulation rulemaking adoption processes: https://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm; https://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13.htm; https://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14.htm; and https://www.arb.ca.gov/regact/2014/capandtrade14/capandtrade14.htm.

[2] *Our Children's Earth Foundation v. California Air Resources Board* (1 Dist. 2015) 234 Cal.App.4th 870 (upholding *Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board* (2012) Case No. CGC-12-519554; 2013 WL 861396) (petition for review by California Supreme Court denied June 10, 2015))

[3] Dr. Barbara Haya, Policy Brief: The California Air Resources Board's U.S. Forest Projects offset protocol underestimates leakage. Berkeley Carbon Trading Project Policy Brief, Center for Environmental Public Policy, Goldman School of Public Policy, UC Berkeley (May 2019)

[4] https://www.arb.ca.gov/cc/capandtrade/offsets/overview.pdf

[5] See https://www.arb.ca.gov/cc/capandtrade/offsets/verification/verification.htm

harvesting at an offset project site causes an increase in timber harvesting elsewhere to meet timber demand. That is, more trees are being harvested outside the project area to compensate for the reduction of trees being harvested within the project area. The studies relied on to identify this leakage focus on conservation forestry practices, which severely restrict or prohibit any harvesting. In contrast, the Forest Protocol focuses on improved forest management activities, which prevent the loss of, or increase carbon storage, in trees. The improved forest management activities do allow for continued harvesting, subject to ensuring increased carbon storage in the forest beyond what is required by existing laws and practice.

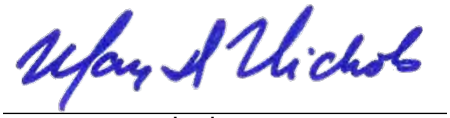
Conservation and improved forest management activities are very different practices. To this point, Dr. Brian Murray, co-author of one of the studies relied on in the policy brief, recently sent members of the Legislature, Secretary Blumenfeld, and Chair Nichols a letter noting the misuse of his research in the policy brief (see attached letter). As expected, the leakage rate under conservation forestry should be higher as it assumes all demand for harvested wood is met through harvesting elsewhere. The leakage rate for improved forestry projects will be lower as some demand for harvested wood is met through allowed limited harvesting in the project area. As such, neither of the studies relied upon in the policy brief to assess the Forest Protocol are applicable.

We agree with you that we must continue to monitor our programs and make program adjustments as needed to ensure the program continues to deliver real GHG reductions in a cost-effective manner. Since the original adoption of the Forest Protocol in 2011, CARB has updated the protocol twice through the formal, public rulemaking process and is committed to periodic reviews to reflect the latest science, including any updates in leakage values. CARB reiterated its commitment to periodically review protocols at the April 5, 2019 Independent Emissions Advisory

Committee meeting.[6] All such reviews are undertaken as part of a transparent and public process to ensure all interested stakeholders, including researchers, are able to share their views and information to inform a staff proposal. This regulatory process is completely separate from, and is not supplanted by, any updates made to voluntary offset protocols. The Compliance Offset Task Force, for which a solicitation for nominations was recently published, will also have an opportunity to engage on new or updated compliance offset protocols.[7]

Thank you again for your continued leadership and interest in the success of our programs. Should you have further questions, please contact Mr. Virgil Welch, Special Counsel to the Chair, CARB, or CalEPA's Deputy Secretary for Legislative Affairs and External Partnerships, Ms. Anna Ferrera.

Sincerely,



Mary D. Nichols
Chair, California Air Resources Board

Jared Blumenfeld
Secretary, Environmental Protection

cc: The Honorable William W. Monning
CARB Ex Officio Member
State Capitol, Room 4040
Sacramento, California 95814

[6] https://calepa.ca.gov/wp-content/uploads/sites/6/2019/04/CARB_IEMAC_April2019.pdf
[7] https://www.arb.ca.gov/cc/capandtrade/offsets/taskforce.htm

The Honorable Laura Friedman
Chair, Assembly Natural Resources Committee
1020 N Street, Room 164
Sacramento, California 95814

The Honorable Eduardo Garcia
CARB Ex Officio Member
State Capitol, Room 4140
Sacramento, California 95814

The Honorable Cristina Garcia
Chair, Joint Legislative Committee on Climate Change Policies
State Capitol, Room 2013
Sacramento, California 95814

Ms. Anna Ferrera
Deputy Secretary for Legislative Affairs and External Partnerships
California Environmental Protection Agency

June 3, 2019

Sen Bob Weickowski
Asm Laura Friedman
Sen Bill Monning
Asm Eduardo Garcia
Sen Ben Allen

Members of the California State Legislature
Sacramento, CA

cc: Mary Nichols, Chair, California Air Resources Board
Jared Blumenfeld, Secretary, California EPA
Bruce McCarl, Professor, Texas A&M University

Dear Members of the Legislature,

It has recently come to my attention that my research has been cited by parties commenting on the issue of leakage relevant to the forestry protocols for California's cap-and-trade program. Having read the policy brief that cites my research to argue that California substantially underestimates leakage (diverted emissions to other locations) from its current forest protocol, it appears that the policy brief misinterprets my research in making the argument.

The policy brief in question, titled "The California Air Resources Board's U.S. Forest offset protocol underestimates leakage", written by Dr. Barbara Haya, a Research Fellow at UC-Berkeley's Center for Environmental Public Policy cites a 2004 article I co-authored with Dr. David Wear in the *Journal of Environmental Economics and Management* (JEEM) on timber harvest restrictions in the Pacific Northwest.

- Wear, D.N. and B.C. Murray. 2004. "Federal Timber Restrictions, Interregional Spillovers, and the Impact on U.S. Softwood Markets." *Journal of Environmental Economics and Management* 47(2):307-330.

I will confine my comments to the use of my JEEM paper to make their point and not to other evidence presented.

The brief accurately states that that the JEEM article examines timber harvest restrictions on federal lands commencing in the late 1980s and finds that the restrictions effectively diverted harvests to other North American forests and that the volume of diverted harvests was more than 80 percent of the volume of harvests avoided in the Pacific Northwest federal forests. The brief then concludes that the carbon leakage from those diverted forests (the losses in carbon diverted elsewhere) must also be in excess of 80 percent of the carbon savings for projects/programs that protect forests. This interpretation is mistaken for a number of reasons.

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First, the flow of timber is not the same as the flow of carbon. Forests in the Northwest are more carbon-dense than forests in the US South, where much of the diversion is found. Thus the diverted carbon is less than the diverted timber. One needs to have a carbon accounting mechanism to estimate these effects. The JEEM paper does not have that.

Second, an accurate estimate of carbon leakage must capture the land use change that is induced by the intervention. Most forest harvesting and management in the US occurs on private lands and the vast majority of private land is used for forestry or agriculture. Therefore, any change that affects markets in the forest sector will affect both the intensity with which forests and agricultural lands are managed (affecting their carbon content) and the allocation of land between forests and agriculture on private lands (in this case, likely affecting the establishment of new forests to make up for the forests "lost" via protection). This must be taken into account. Forest and agricultural markets operate over larger geographic regions than just the location where the forest project intervention occurs so the land use change effects will also be dispersed spatially. The JEEM paper does not capture this.

Third, because of the two factors above, the leakage from any forest carbon project intervention will depend tremendously on where that intervention occurs. Leakage from an avoided deforestation project in the Northwest could be substantially different from a similar project in the South. Yet the JEEM paper only addresses interventions in the Pacific Northwest and, even putting aside the two technical shortcomings referenced above, should not be used to attribute leakage effects for projects in other regions that may be generating offsets for the California market.

Realizing that the JEEM paper on timber markets might be used as a proxy for leakage, I embarked on a body of research with Professor Bruce McCarl of Texas A&M University, who is the developer of the FASOMGHG model of the US forest and agricultural sectors that captures forest and agricultural commodity markets, land use allocation and comprehensive greenhouse gas accounting across all sectoral activities. That work, among other things, estimated the potential for leakage from regional forest carbon activities incorporating the features that I mention above. This work was published in the following outlet:

- Murray, B.C., B.A. McCarl, and H. Lee. 2004. "Estimating Leakage from Forest Carbon Sequestration Programs." *Land Economics* 80(1):109-124.

I do not know why the policy brief cited the JEEM article rather than the Land Economics article since they were both released at about the same time and the Land Economics piece was far more appropriate sources given that it was actually targeted at carbon leakage, which the JEEM article was not.

This study found wide variation in estimates, but generally lower than would have been implied by JEEM. Indeed the Land Economics paper even used the JEEM article as the point of departure and found leakage from avoided deforestation in the Pacific Northwest is likely much lower (less than 10%) than the JEEM estimates (more than 80%). The leakage effects from avoided deforestation in the South are in the 20-30% range. Avoided deforestation, though could be high in the Lake States in the Midwest or the Northeast if projects originate from there, but I do not know if those are common origins of offsets for California.

Another study that I contributed to at around the same time showed even lower leakage levels than those implied in the Land Economics study, but that study focused on national programs, both forest

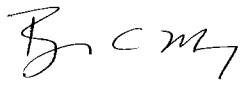
and agriculture, not regional ones focused on forests, and thus is not as appropriate a source for the California forest offsets program

- Murray, B.C., B.L. Sohngen, A.J. Sommer, B.M. Depro, K.M. Jones, B.A. McCarl, D. Gillig, B. DeAngelo, and K. Andrasko. 2005. EPA-R-05-006. "*Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture*." Washington, D.C: U.S. Environmental Protection Agency, Office of Atmospheric Programs.

I believe leakage is an important issue in forest carbon programs and I devoted a substantial amount of my professional effort in the early 2000s exploring its nature and empirical magnitude. I think California is absolutely right to adjust offset quantities to account for leakage as this will give a more proper accounting of the net benefits of the transactions. The empirical work is not easy and I do not pretend that the estimates from my work with others, generated more than ten years ago, focused on hypothetical programs are precise estimates of what happens today with real programs. But to my knowledge, they are the only (or perhaps one of a few) peer-reviewed estimates of carbon leakage in US regional programs out there. As such, I encourage California to fund more work in this area using a range of methods and tapping other researchers to give a more contemporary view and policy guidance for today.

I will also point out that leakage exists in the other sectors affected directly by the California cap and trade program. While the state has taken great efforts to address this in the electric power sector through resource shuffling provisions, and these effects have likely reduced leakage, it has probably not eliminated it. Moreover the program may also be diverting activity and emissions to other states through the interaction of inter-regional and global markets for industrial goods. This is the unfortunate fact of any emissions control program that is regionally confined. This does not mean that the program should not be undertaken, just that it is not as effective as a comprehensive global (or even national) program. California cannot create that outcome but understand the shortcomings of what it does create, a program that will have leakage effects for all sectors, including via forest offsets.

Sincerely,



Brian C. Murray, PhD
Director, Duke University Energy Initiative
Research Professor, Nicholas School of the Environment and Sanford School of Public Policy
Duke University

CALIFORNIA LEGISLATURE

STATE CAPITOL
SACRAMENTO, CALIFORNIA
95814

May 8, 2019

The Honorable Jared Blumenfeld, Secretary
California Environmental Protection Agency
1001 I Street
P.O. Box 2815
Sacramento, CA 95812

The Honorable Mary Nichols, Chair
California Air Resources Board
1001 I Street
P.O. Box 2815
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Re: Concerns with the environmental integrity of California's carbon offsets program

Dear Secretary Blumenfeld and Chair Nichols,

This letter addresses the role of carbon offsets in California's cap-and-trade program—specifically, the concern that methodological weaknesses in the U.S. Forest Protocol may be undermining its environmental integrity and frustrating California's progress toward its legally binding 2030 greenhouse gas emissions limit, as established by SB 32 (Pavley, Chapter 249, Statutes of 2016).

According to data from the Air Resources Board (ARB), the U.S. Forest Protocol has generated 122 million offset credits as of April 10, 2019. This volume is 80% of the nearly 153 million offset credits that have been issued so far in the state's cap-and-trade program for greenhouse gas emissions. Each offset credit allows its owner to emit one ton of carbon dioxide-equivalent, which means that these 122 million U.S. Forest Protocol offsets enable polluters to emit an additional 122 million tons of carbon dioxide-equivalent beyond their limits under the cap-and-trade program. Beyond enabling higher greenhouse gas emissions in California's capped sectors,

offsets also enable associated criteria and toxic air pollutants, many of which are emitted in disadvantaged communities that already experience disproportionate environmental impacts.

The size of the forest offsets program is significant both in relation to the broader cap-and-trade program and to ARB's strategy for achieving the 2030 statewide greenhouse gas emissions limit. ARB's 2017 Scoping Plan calls on the cap-and-trade program to reduce 236 million tons of carbon dioxide-equivalent on a cumulative basis over the period 2021 through 2030, making it the single largest contributor to the state's post-2020 climate policy portfolio. For comparison, the 122 million U.S. Forest Protocol offsets issued to date represent more than half of the cumulative reductions ARB expects from the cap-and-trade program over the next decade. Due to the size of the forest offsets program, any problem affecting the quality of forest offset credits would also affect the environmental integrity of the entire offsets program, the broader cap-and-trade program, and, potentially, California's ability to achieve the SB 32 limit.

To address these risks, state law requires that offset credits must reflect emission reductions that are "real, permanent, quantifiable, verifiable, and enforceable" (Health & Safety Code § 38562(d)(1)). Offsets may only be awarded to projects that generate emission reductions that are "in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur" (*Id.* at § 38562(d)(2)). Finally, offset projects' credited emission reductions should "occur[] over the same time period" and be "equivalent in amount to any direct emission reduction" required pursuant to California's climate laws (*Id.* at § 38562(d)(3)).

A number of recent criticisms suggest that the Protocol's standards may not be consistent with these requirements. Because of the forest offset program's prominent role and the substantial criticisms that have been made about its performance, a thorough and independent review of the environmental integrity of the U.S. Forest Protocol is needed to give policymakers confidence that the credits the protocol generates are real and contribute to state climate policy goals.

This letter describes two concerns with the U.S. Forest Protocol's methodology for addressing emissions leakage. In the context of forest offsets, leakage occurs when a landowner increases carbon storage on a particular forest parcel by reducing planned timber harvesting but, as a result, some of the avoided harvest shifts (or "leaks") to another forest parcel to satisfy existing demand for forest products. This effect occurs because markets for forest products, such as timber and paper pulp, are regional and often international in scope. Properly accounting for leakage is necessary to ensure that offset credits comply with state legal standards for environmental integrity because if offset protocols do not properly account for leakage, they will enable a larger increase in pollution within the cap-and-trade program than the reductions they achieve outside the program's capped sectors.

First, as the Independent Emissions Market Advisory Committee (IEMAC) observed in its 2018 Report, ARB applies a leakage factor of 20% in the U.S. Forest Protocol, meaning that 20% of the reduction in timber harvesting attributable to an offset project is assumed to be displaced and therefore expected to occur somewhere else. ARB's U.S. Forest Protocol is based on a voluntary protocol developed by the Climate Action Reserve, however, and the voluntary protocol

currently uses a leakage factor of 80% for projects of this type—four times higher than the number used in ARB's protocol. As the IEMAC wrote in its 2018 offsets chapter:

> Given that the U.S. Forest protocol is the largest of the protocols in terms of credits issued, it would be helpful to have a better understanding of the scientific basis for leakage factors and the temporal accounting between reductions that are credited, emissions that leak, and actual physical emissions reductions or avoided emissions that take place. It would also be helpful to know if [ARB] is considering revising the protocol to reflect the Climate Action Reserve changes. The subcommittee recognizes, however, that leakage factors may be highly contextual to each individual project and therefore empirically difficult to estimate. Nevertheless, if reliance on the protocol continues to be large, additional information would be useful to understand whether and to what degree leakage is occurring, as well as to evaluate whether or not credits under this protocol can be reliably deemed "quantifiable" pursuant to state law.[1]

The IEMAC went on to make two related recommendations:

> 2) We … recommend that [ARB] either conduct or solicit research to determine whether the leakage rate for avoided conversion projects in the forestry protocol is appropriate.
>
> 3) We further recommend that [ARB] consider whether it should amend the U.S. Forest Offset Protocol to change the leakage factor for Improved Forestry Practices to be consistent with recent changes to the Climate Action Reserve Forestry Protocol.[2]

Beyond the discrepancies between leakage rates used in ARB's U.S. Forest Protocol and the voluntary Climate Action Reserve standard on which it was based, a 2018 report from the Environmental Commissioner of Ontario found that ARB never cited any studies nor presented any other affirmative evidence supporting its selection of a 20% leakage factor.[3]

Second, new research suggests that there may be significant issues with the protocol that speak to the IEMAC's interest in the "temporal accounting between reductions that are credited, emissions that leak, and actual physical emissions reductions or avoided emissions that take place." According to a UC Berkeley study, the U.S. Forest Protocol significantly over-credits forest offset projects due to an inconsistency between the way the Protocol awards credits for avoided timber harvests and the way the it accounts for leakage.[4] Offset projects that claim to avoid timber harvests are given a lump-sum, upfront payment in the form of offset credits. These credits are intended to reflect climate benefits based on the assumption that, under a business-as-usual scenario, the forest would be harvested immediately. Although the Protocol assumes that such projects avoid timber harvesting in their first year of crediting, it accounts for leakage as

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1 2018 Report of the Independent Emissions Market Advisory Committee (Oct. 2018) at 45.
2 *Id.* at 47.
3 Environmental Commissioner of Ontario, Ontario's Climate Act: From Plan to Progress (2018) at 144-45.
4 Dr. Barbara Haya, Policy Brief: The California Air Resources Board's U.S. Forest Projects offset protocol underestimates leakage. Berkeley Carbon Trading Project Policy Brief, Center for Environmental Public Policy, Goldman School of Public Policy, UC Berkeley (May 2019).

though modest harvesting were expected to occur in every year for 100 years in the business-as-usual scenario. This approach appears to be fundamentally inconsistent because a forest is either harvested in one large event in one year, or continuously in smaller events over many years—but not both. Furthermore, the choice to mix assumptions appears structured to generate the maximum number of credits awarded to the project in its first year, despite the physical inconsistencies implied by the assumptions necessary to enable this outcome.

The UC Berkeley study concludes that the effect of this temporal disconnect is large and concerning. In spreading out leakage impacts over 100 years, rather than accounting for leakage contemporaneously with the timber harvest that is purportedly avoided in an offset project's first year, the Protocol awards significantly more credits to projects than the emissions they have actually avoided, net of leakage, until the end of the 100-year period. As a result, many of the credits issued today reflect an environmental debt that will only be paid off over the course of 100 years. Even if ARB's current leakage factor of 20% is accurate, the UC Berkeley study finds that 35% of the 122 million U.S. Forest Protocol offsets represent emission reductions that have not yet occurred. If a higher leakage factor of 80% is justified, then 82% of the 122 million existing credits represent reductions that have not yet occurred. Nevertheless, all of these credits can be used to increase in-state emissions today.

Furthermore, the time horizon over which forest offset projects' emission reductions are credited appears to be inconsistent with the purposes and objectives of state law. As mentioned above, state law indicates that when ARB chooses to authorize market-based programs like carbon offsets, these programs should reflect emission reductions that occur "over the same time period" as the direct reductions required under AB 32 and SB 32 (Health & Safety Code § 38562(d)(3)). As you know, the only statewide greenhouse gas emission reductions targets codified in statute are for the years 2020 and 2030 (*Id.* at §§ 38550, 38566). Similarly, the cap-and-trade program itself, which ARB designated as a direct emission reduction measure in its 2017 Scoping Plan,[5] is authorized only through the end of 2030 (*Id.* at § 38562(c)(2)). Yet forest offset credits are being used under the cap-and-trade program to justify higher in-state emissions today on promise of avoided emissions over the course of the next 100 years—a timeframe that extends well beyond the cap-and-trade program's statutory authorization.

Finally, it is worth noting that forest carbon offsets do not help California achieve its statewide emission limits for 2020 and 2030. This is because ARB's statewide greenhouse gas emissions inventory does not count emissions from the natural and working lands sector, which includes forestry, toward the statewide limits. Therefore, any reduced or avoided emissions in this sector—whether from projects located in California, or, as authorized by and common under the U.S. Forest Protocol, elsewhere in the United States—do not actually contribute to the statewide emission limits ARB is charged with achieving. Instead, the primary rationale for offsets should be seen as a mechanism to reduce compliance costs for polluters regulated under the cap-and-trade program. That rationale is strained, however, in the presence of significant allowance

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[5] ARB, California's 2017 Climate Change Scoping Plan (Nov. 2017) at 6 (describing the Scoping Plan's policies that "require direct emission reductions" as including the cap-and-trade program); *id.* at 34, Table 4 (listing the cap-and-trade program as a regulation that "Prioritize[s] … Direct GHG Reductions").

overallocation conditions that are described in a March 1, 2019, letter from legislative leaders to your offices and confirmed in the data disclosure attached to your April 22, 2019, response.

In light of the concerns outlined here, ARB should undertake an independent review of the U.S. Forest Protocol that is conducted by technical experts who lack financial conflicts of interest with both buyers and sellers in the state's forest offsets program. Such a review should include a careful analysis of leakage issues as well as whether projects under the protocol are producing reductions that are additional to what would be expected under business-as-usual conditions in the absence of the offsets program.

The case for offsets as a viable climate policy strategy rests on the assertion that offset protocols are sufficiently rigorous to ensure that credited reductions are "real, permanent, quantifiable, verifiable, and enforceable" as well as additional with respect to any greenhouse gas emission reductions that would have occurred in the absence of the offset project. Fundamentally, offset credits allow higher in-state emissions under the cap-and-trade program today, on promise of reduced or avoided emissions somewhere else. An independent evaluation of the technical concerns outlined here is essential if policymakers are to be confident that the offsets program is operating pursuant to the requirements of state law.

Thank you for your continued leadership on climate policy and your diligence to ensure that California achieves the 2030 SB 32 target for greenhouse gas emission reductions. We look forward to working together in the coming months and years.

Sincerely,

Bob Wieckowski, Chair
Senate Budget and Fiscal Review
Subcommittee #2

Laura Friedman, Chair
Assmebly Natural Resources Committee

William W. Monning, Senator
ARB Ex Officio Member

Eduardo Garcia, Assmeblymember
ARB Ex Officio Member

Ben Allen, Chair
Senate Environmental Quality Committee