EARTHJUSTICE

November 8, 2024

via electronic submittal

Clerk of the Board
California Air Resources Board
1001 I. Street
Sacramento, CA 95814

Re: Earthjustice Comments on the Environmental Impact Analysis for Proposed Regulatory Amendments to the Low Carbon Fuel Standard

Honorable Members of the California Air Resources Board:

Earthjustice submits the following comments on the Environmental Impact Analysis ("EIA") for the California Air Resources Board ("CARB") Proposed Amendments to the Low Carbon Fuel Standard Regulation ("Proposed Amendments" or "Project").[1] On September 30, 2024, Earthjustice submitted comments on the Recirculated Draft Environmental Impact Analysis ("RDEIA"). On October 1, 2024, CARB issued a Second 15-day change to the Proposed Amendments, but CARB did not supplement its environmental analysis or introduce any additional mitigation measures.[2]

On the evening of November 6, 2024, CARB published its response to comments on the Draft EIA ("DEIA") and RDEIA as well as the Final EIA ("FEIA"). CARB allowed a single day to provide public comment on the FEIA. Notwithstanding CARB's failure to provide the public a meaningful opportunity to respond to the FEIA, we highlight multiple ways in which CARB's responses and the FEIA do not address or remedy concerns raised in prior comments, and we detail additional deficiencies in CARB's environmental review, including new problems introduced by the second 15-day changes after the comment period for the RDEIA closed. Specifically, CARB's environmental review is deficient in the following respects:

1. CARB fails to analyze and disclose the effects of imminent step-downs in the carbon intensity ("CI") benchmark, as a result of the newly amended Auto Acceleration Mechanism ("AAM");
2. CARB fails to cure the multiple defects in the EIA's analysis of the impacts of increased crop-based biofuel production;

[1] CARB acts pursuant to a certified regulatory program which exempts the agency from preparing an Environmental Impact Report ("EIR") because the environmental analysis CARB is required to undertake is deemed the functional equivalent of an EIR. 17 Cal. Code. Regs. §§ 60000-60007; *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 710. CARB's functional equivalent is an Environmental Impact Analysis ("EIA").

[2] https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf.

3. CARB continues to fail to address the flaws in its analysis of emissions of biofuels combustion in California vehicles;
4. CARB continues to fail to address the violations associated with its analysis and disclosure of localized impacts from biofuel production and to adopt all feasible mitigation measures;
5. CARB fails to cure defects in its treatment of electrolytic hydrogen;
6. CARB fails to analyze and disclose impacts from the production of hydrogen derived from fossil methane and to mitigate those impacts;
7. CARB continues to fail to address and mitigate the impacts of its reliance on direct air capture ("DAC") and to adopt all feasible mitigation;
8. CARB fails to analyze and mitigate the effects of massive reduction in support for electrification of medium and heavy duty vehicles; and
9. CARB continues to fail to analyze a reasonable range of alternatives.

Given the many deficiencies in CARB's analysis and disclosure of the Project's impacts as well as its failure to adopt all feasible mitigation measures, CARB must recirculate an environmental review for public review and comment.

Finally, because comments on the Second 15-Day Change to the Project address the Project's environmental effects, we hereby incorporate by reference those comments, which CARB did not address in its Response to Comments. We also submit into the record by attachment the materials upon which certain prior comments rely. That material is available in the folder linked here, which makes it readily accessible to CARB and thus submitted for inclusion in the record. See Pub. Res. Code § 21167.6(e)(7); *Consolidated Irrig. Dist. v. Superior Court* (2012) 205 Cal.App.4th 697.

I. CARB Fails to Analyze and Disclose the Effects of Imminent Step-Downs in the Carbon Intensity Benchmark.

A. CARB Does Not Explain How the New Changes to the AAM Will Function.

The AAM mechanism, first proposed by CARB in the Initial Statement of Reasons ("ISOR"), is intended to allow CARB to adapt the CI benchmark schedule in response to specified market conditions without having to undertake another rulemaking, meaning that the change in stringency of the program does not require additional public review or Board approval. This approach is unique to these amendments, as any change to an annual benchmark schedule has previously required additional rulemaking. Further, the second 15-day change Proposal introduces ambiguity into how the AAM will function in the future. As commenters have noted, the newly proposed regulatory text is not clear and can be read to allow and lead to very different outcomes for the CI benchmark.[3] CARB has declined to clarify what the regulatory text means.

[3] In one interpretation, a trigger announced in one year (whether that announcement occurs in February, May, August, or November) would go into effect the following calendar year, which would be inconsistent with staff's Notice of Availability statement that the revision would "[provide] further market

In response to a question about the meaning of the new provisions, CARB stated that it will not explain the meaning of the text until it issues the Final Statement of Reason ("FSOR").[4] Per CARB procedure, CARB will issue the FSOR after CARB has issued the Notice of Decision ("NOD") on its environmental review and after the Board votes on whether to approve the Project. Therefore, the regulation's meaning and effects will remain unknown to the public and decision-makers until after the window for analysis and deliberation is closed.

CARB's failure to disclose the meaning and intent of its proposed changes to the AAM violates CEQA's requirement that the agency accurately describe its project. As we explained in our September 30 comments, "[a]n accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 730 (quoting *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193). An accurate project description is "the heart of the EIR process" and "necessary for an intelligent evaluation of the potential environmental effects of a proposed activity." *Sacramento Old City Ass'n. v. City Council* (1991) 229 Cal.App.3d 1011, 1023; *San Joaquin Raptor/Wildlife Rescue Center,* 27 Cal.App.4th at 730. While extensive detail is not necessary, the law requires that CEQA documents describe proposed projects with sufficient detail and accuracy to permit informed decision-making. *See* CEQA Guidelines § 15124 (project description). To adequately evaluate the environmental ramifications of the Project, CARB must first provide a comprehensive description of the project itself and its failure to do so here is a violation of CEQA.

B. Although Future AAM Step-Downs in the CI Benchmark Are Highly Likely to be Triggered, CARB Does Not Analyze or Disclose Their Environmental Effects.

As we explained in our September 30 comments, CARB's modeling in the RDEIA lacks support and violates CEQA because it assumes that the credit price will be $0 during several years in the near future but fails to describe this feature of the Project and analyze the associated, reasonably foreseeable impacts. As modeled, the Proposed Scenario in the 15-day Proposal

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certainty and lead time to LCFS participants," as that would only be true if the trigger was announced in February (10.5 months' lead time). CARB, Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information (Oct. 1, 2024) at 5, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf. The same lead time as the previous version would be given for a trigger announced in May (7.5 months), and less lead time would be given for a trigger announced in August or November (4.5 and 1.5 months, respectively). In another interpretation, there would be additional lead time, consistent with staff's Notice statement but an additional acceleration could be triggered before the previous trigger went into effect, which could cause overcorrection in the market. In both interpretations, sequential year triggers could occur, counter to the original proposal and which staff have not explained in their project description, nor analyzed. *See* also Duffy, James, email correspondence with CARB staff "Re: How to interpret the proposed text in section 95484." (Oct. 16, 2024), https://www.arb.ca.gov/lists/com-attach/1-lcfs2024-2nd15day-BmJcLwNkBTAHeFAP.pdf.

[4] *See* Duffy, email correspondence with CARB staff "Re: How to interpret the proposed text in section 95484." (Oct. 16, 2024), https://www.arb.ca.gov/lists/com-attach/1-lcfs2024-2nd15day-BmJcLwNkBTAHeFAP.pdf.

shows credit prices of $0 in 2029, 2030, 2031 and 2032.[5] This is problematic for at least two reasons.

First, CARB does not explain how the Project can properly claim greenhouse gas benefits (or any other benefit) if it no longer provides a subsidy to purportedly cleaner fuels (due to the $0 credit price). A $0 LCFS credit price implies that the market is saturated with enough low-carbon fuel to meet or exceed regulatory benchmarks without requiring a LCFS financial incentive to encourage the production of these fuels or their delivery to California. A repeated stated purpose of the LCFS is to provide price signals for investment.[6]

Second, given that a $0 credit price implies oversupply of low-carbon fuels relative to the deficits needed to meet annual benchmarks, it is reasonable to expect that the AAM will be triggered at least once before 2030.[7] Triggering an AAM advances the benchmark schedule by a year, such that a trigger effective in 2030 would change the benchmark from the staff's proposed 30% CI reduction to a 34.5% CI reduction. Thus, the annual change from 2029 to 2030 would be nearly 6%, rather than staff's proposed 1.45% change. A step-down of this CI stringency has not been modeled by CARB.[8] The RDEIA does not describe this outcome in the project description or properly analyze its impacts, including effects that are reasonably foreseeable.

Despite these fundamental shortcomings in its analysis, CARB did not update its model to include the environmental effects of the future AAM triggers. This failure persists in the second 15-day change. CARB has not modeled likely step-downs in the CI stringency that are likely to occur as a result of its new AAM proposal. Thus, CARB's failure to explain the meaning and effects of its second 15-day proposal on the CI benchmark violates CEQA.

C. CARB Admits that Changes to the CI Stringency Will Have Environmental and Cost Impacts.

CARB's failure to analyze and disclose the effects of its newly proposed change to the AAM is particularly troubling because CARB itself admits that the program's CI targets will impact the environment. In the DEIA, CARB rejected Alternative 4, which assumed an increase

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[5] *See* CARB, Modeling Output Sheets from 15-Day Package, Proposed Scenario at Row 51, https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day_Proposed_9step_30_final_posted_0.xlsx.

[6] *See* ISOR https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf; CARB's February 2023 LCFS Workshop slides 11, 12, and 14: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/LCFSpresentation_02222023.pdf; CARB's May 2023 LCFS Workshop at slide 6: https://ww2.arb.ca.gov/sites/default/files/2023-05/LCFSPresentation_052223_0.pdf; CARB's August 2023 LCFS Workshop, slide 5, https://ww2.arb.ca.gov/sites/default/files/2023-08/Workshop%20Slides_1.pdf; CARB's April 2024 LCFS Workshop, slide 18, https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.

[7] To trigger the AAM, the program must (1) be generating more credits than deficits and (2) have a credit bank exceeding three quarters of annual deficits. A $0 credit price indicates oversupply of credits relative to deficits. CARB currently has a bank exceeding 29 million credits (CARB Quarterly Data Summary, Q2 2024, published October 31, 2024, https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries), and growth of the credit bank is accelerating.

[8] CARB has not modeled a 9% step-down in 2025 with any changes to the benchmark with one or more AAM triggers, which is a foreseeable outcome of the proposed regulation. Additionally, CARB has not modeled any potential health outcomes from such a foreseeable outcome.

in the CI reduction target to 40% in 2030, among other differences from the Proposed Amendments. CARB offered the following reasons for rejecting Alternative 4:

While this alternative does meet most of the objectives of the Proposed Amendments, it was rejected because increasing the CI reduction target and allowing fewer limits on biofuels crediting in this scenario increases the risk of greater environmental impacts than the Proposed Amendments. The alternative also would result in higher direct costs and CARB is mandated by AB 32 to consider the cost-effectiveness of measures. As an example of potential risk of greater environmental impacts, increasing the CI reduction target to 40% in 2030 would result in an increase of the compliance responses associated with the Proposed Amendments and in turn would result in an increase in the environmental impacts as disclosed on Chapter 4.0.[9]

Given these effects of Alternative 4, CARB staff "did not pursue further evaluation of this alternative for the purposes of the Draft EIA."[10] Although it first rejected a 40% target in 2030, the newly proposed amendments may lead to this very outcome. As one analysis of the original Proposal explains, "Staff's proposal for an AAM includes a prohibition on the AAM being triggered two years in a row but there is no proposed limit on the number of triggers. If multiple triggers occur, such as in 2028 and 2030, **the benchmark could increase in stringency by over 20% in just four years**, demonstrating the accelerated impact of successive triggers on the schedule. In such a case, the target would be 23.25% in 2027 and 43.5% by 2031."[11] In the second 15-day change Proposal, the benchmark could be even more stringent, as appears to allow the AAM to be triggered two years in a row. In other words, the 40% step-down in 2030 may in fact occur under the newly proposed amendments.

Therefore, because CARB has not explained the meaning of its new proposal or modeled its effects, the public and decision-makers do not have sufficient information to understand the impacts of the proposed regulation, which could be significant. These failures violate CEQA. "Only through an accurate view of the project may outsiders and public decision-makers balance the proposal's benefits against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal . . . and weigh other alternatives in the balance." *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192. Here, rather than "demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action," CARB appears to be masking the severity of Project impacts and also failing to adopt feasible measures to reduce the Project's serious environmental harms. *Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 392. Further, without justification, CARB is now proposing key features of an Alternative that it previously rejected on the basis of high environmental risks and cost implications. CARB has not explained or justified the basis for this change.

[9] DEIA at 179 (emphasis added).
[10] *Id*.
[11] Laskowski, Explainer – LCFS Auto Acceleration Mechanism, (2024), https://www.cheryllaskowski.com/ca-lcfs-aam (emphasis in original).

II. CARB Fails to Cure the Multiple Defects in the EIA's Analysis of the Impacts of Increased Crop-Based Biofuel Production.

In our comments on the RDEIA, Earthjustice identified multiple flaws in the EIA's assessment of the impacts from the Proposed Amendments' incentivization of crop-based biofuel production. For example, CARB's environmental assessment relies on outdated modelling that does not reflect existing or anticipated levels of biofuel production, fails to disclose the impacts of increased biofuel production on human health by exacerbating global food insecurity, fails to make a good faith effort to disclose the uncertainties and unsupported assumptions in indirect land use change ("ILUC") modelling, and fails to adopt feasible mitigation to address the significant impacts of increased crop-based biofuel production.[12] Because the FEIA fails to remedy any of these fatal shortcomings, the EIA continues to violate CEQA.

A. The EIA's Reliance on 2014 Biofuel Volumes to Assess Indirect Land Use Impacts of Crop-Based Biofuel Production Violates CEQA's Baseline and Cumulative Impact Requirements.

As Earthjustice stated in earlier CEQA comments, the EIA's assessment of the greenhouse gas impacts of increased crop-based biofuel production improperly relies on decade-old biofuel volumes that fail to reflect the dramatic growth in crop-based biofuels.[13] In failing to model both existing global levels of biofuel production to set a baseline for Project impacts and increased biofuel production resulting both from the Project and past, present, and probable future actions in California, the EIA violates CEQA's baseline and cumulative impact requirements. *See* Guidelines §§ 15125, 15130.

1. Unlike Other Lifecyle Factors that Are Routinely Updated, CARB's CEQA Analysis Applies Decade-Old ILUC Factors for Crop-Based Biofuel Production.

In 2009, CARB first adopted the Global Trade Analysis Project ("GTAP") model as part of its original adoption of the LCFS program.[14] In 2011, the Board directed staff to work with interested stakeholders to update ILUC values for various biofuels.[15] As part of 2015 LCFS readoption, the GTAP model was updated and the Agro-Ecological Zone Emissions Factor ("AEZ-EF") model was created to supplement GTAP's estimates of GHG emissions from various types of land conversions.[16] CARB's methodology for calculating carbon intensity from ILUC is set forth in their December 2014 Detailed Analysis for Indirect Land Use Change as part of 2015 LCFS readoption.[17]

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[12] Earthjustice Comments on RDEIA for the Proposed Regulatory Amendments to the Low Carbon Fuel Standard ("Earthjustice RDEIA Comments") at 3-20.
[13] Earthjustice RDEIA Comments at 4.
[14] *See* CARB, LCFS Land Use Change Assessment, https://ww2.arb.ca.gov/resources/documents/lcfs-land-use-change-assessment.
[15] *Id.*
[16] *Id*.
[17] CARB, Detailed Analysis for Indirect Land Use Change (Dec. 2014), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf.

As part of its 2018 LCFS Update, CARB did not update ILUC values.[18] Instead, CARB stated it "maintains its commitment to periodic review and assessment of land use change emissions" and "is committed to continuing review of indirect effects including land extension/intensification, multi-cropping, and cross-product substitutions for various feedstocks used in fuel production after the completion of this round of rulemaking."[19] Yet in the six years since, CARB conducted no such review. In the 2024 Proposed Amendments to the LCFS, CARB continues to rely on the same ILUC values as it did in the 2015 LCFS Readoption.[20]

ILUC Values in 2015 LCFS

Table 5. Summary of iLUC Values

Biofuel	iLUC (gCO_2/MJ)
Corn Ethanol	19.8
Sugarcane Ethanol	11.8
Soy Biodiesel	29.1
Canola Biodiesel	14.5
Sorghum Ethanol	19.4
Palm Biodiesel	71.4

ILUC Values in Proposed Amendments

Table 6. Land Use Change Values for Use in CI Determination

Biofuel	*LUC (gCO_2/MJ)*
Corn Ethanol	19.8
Sugarcane Ethanol	11.8
Soy Biomass-Based Diesel	29.1
Canola Biomass-Based Diesel	14.5
Grain Sorghum Ethanol	19.4
Palm Biomass-Based Diesel	71.4

Notably, CARB regularly updates other factors used in the LCFS for lifecycle assessment. For example, the Greenhouse gases, Regulated Emissions, and Energy use in Technologies ("GREET") model is a life cycle assessment database developed by Argonne National Laboratory. GREET facilitates evaluating the energy and environmental impacts of various vehicle and fuel technologies across their entire life cycles and is regularly updated. CARB staff adapted the database to develop a California-specific version, called CA-GREET, which is used for many parts of a fuel pathway's CI score. CA-GREET has been updated several times to reflect better or newer information about GHG emissions in fuel pathways. CA-GREET

[18] *Compare* 2015 LCFS Regulations at 60, Table 5: Summary of ILUC Values https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2015/lcfs2015/lcfsfinalregorder.pdf *with* 2018 LCFS Regulations at 157, Table 6, Land Use Change Values for Use in CI Determination, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/fro.pdf (tables showing identical ILUC biofuel values).

[19] CARB, LCFS Amendments to the Low Carbon Fuel Standard Regulation and the Regulation on Commercialization of Alternative Diesel Fuels, Final Statement of Reasons at 491 (Nov. 2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/fsorlcfs.pdf.

[20] 2015 LCFS Regulations at 60, Table 5: Summary of ILUC Values https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2015/lcfs2015/lcfsfinalregorder.pdf; at 122, Proposed Regulation Order, Table 6: Land Use Change Values for Use in CI Determination https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf. While the proposal notes that for certain regions an applicant may have to conduct a separate LUC evaluation, CARB has already approved the current LUC value (29.1) for Argentina, a region not specified in the table and which has significant deforestation issues. *See* https://ww2.arb.ca.gov/resources/documents/2023-lcfs-pathways-requiring-public-comments, Application B0521, approved 12/8/2023, despite public comments noting potential issues.

was updated for the 2015 LCFS readoption (v2.0), the 2018 LCFS amendments (v3.0), and a new version (v4.0) is being proposed as part of the current LCFS amendments. The model is published for public comment along with underlying documentation.[21]

Similarly, the Oil Production Greenhouse gas Emissions Estimator ("OPGEE") is a lifecycle assessment tool estimating the GHG emissions from crude petroleum and natural gas.[22] The model was created in response to Board direction[23] to develop annual CI values for crude oil used in California, which are used to calculate annual incremental deficits for fossil gasoline or diesel fuel.[24] CARB contracted Stanford University to initially develop the model and subsequently update it for the 2015 LCFS readoption (OPGEE v1.1E) and the 2018 LCFS amendments (OPGEE v2.0c), and again for the 2024 update (OPGEE v3.0b).[25] The model is published for public comment along with underlying documentation.[26] Accordingly, CARB's failure to update ILUC factors stands apart from its regular reevaluations of other lifecycle calculations.

2. CARB's Failure to Update ILUC Factors to Account for Significant Increases in Crop-Based Biofuel Production Serves to Understate Project Impacts in Direct Contravention of CEQA.

In evaluating Project impacts, CARB relied on decade-old projections of biofuel production that do not reflect the explosive growth in crop-based biofuel production and corresponding impact on ILUC emissions. Because biofuels are a global market and the United States is now importing biofuels to meet renewable diesel demand,[27] CARB further erred in only looking at domestic production. As the Food and Agriculture Organization of the United Nations ("FAO") observes, where increased productivity cannot meet demand, "mandating the use of biofuels in one region may increase global GHG emissions due to indirect land-use changes in

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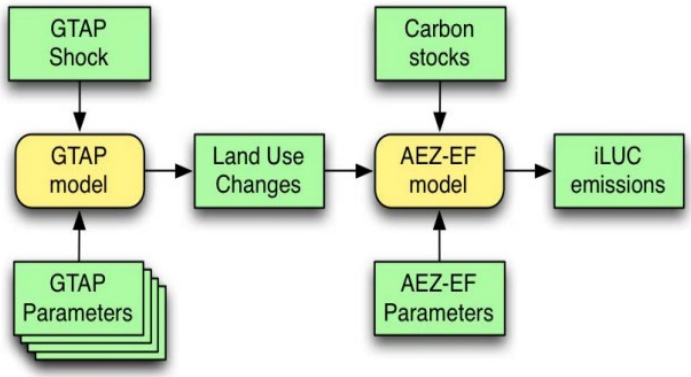
[21] *See* CARB, LCFS Life Cycle Analysis Models and Documentation, https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation.
[22] *See* A. Brandt et al., Oil Production Greenhouse Gas Emissions Estimator, OPGEE v3.0b (June 15, 2022), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/opgee_v3.0b_methodology.pdf.
[23] CARB, LCFS Crude Oil Life Cycle Assessment, https://ww2.arb.ca.gov/resources/documents/lcfs-crude-oil-life-cycle-assessment.
[24] *See* Section 95489 of the LCFS regulation. Incremental deficits are assigned to each affected fuel reporting entity's compliance obligation if the carbon intensity is higher than the standard.
[25] *See* CARB, Public Workshop on Revisions to Oil Production Greenhouse Gas Emissions Estimator (Apr. 26, 2022), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/opgee-carb-presentation.pdf.
[26] *See* CARB, LCFS Crude Oil Life Cycle Assessment, https://ww2.arb.ca.gov/resources/documents/lcfs-crude-oil-life-cycle-assessment.
[27] USEIA, Petroleum & Other Liquids, US Imports of Biodiesel (11.929 million barrels of biodiesel imported in 2023), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPOORDB_IM0_NUS-Z00_MBBL&f=A; USEIA, Petroleum & Other Liquids, U.S. Imports of Renewable Diesel Fuel (8.662 million barrels imported in 2023), https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPOORDO_IM0_NUS-Z00_MBBL&f=A.

locations where the biofuel feedstock is grown."[28] In failing to assess Project impacts based on existing and projected global levels of biofuel production, the EIA violates CEQA's baseline and cumulative impact requirements.

In determining the ILUC emissions from biofuels, as illustrated below in an excerpt from CARB's Analysis of Indirect Land Use Change, the primary input is supply "shock," which "corresponds to an increase in the volume of biofuel production used as an input to model to estimate land use changes."[29]

Figure H-4. Integration of the GTAP-BIO Model with the AEZ-EF Model



To assess ILUC emissions for the readoption of the LCFS in 2015, CARB applied the following shocks, which corresponded to anticipated impacts of the U.S. Renewable Fuel Standard ("RFS") quantities as structured at that time compared to a 2004 baseline.[30] With the exception of sugarcane ethanol, CARB applied shock values that only looked at U.S. biofuel production.[31]

The shock values CARB applied for the 2015 LCFS readoption do not account for the explosion of renewable diesel ("RD") and biodiesel ("BD") derived from crop-based biofuels[32] since that time. As observed by the United States Department of Agriculture ("USDA"), "[d]uring the past few years, the landscape for U.S. renewable diesel production has drastically changed….this dramatic U.S. production and capacity growth is causing significant, market-

[28] FAO, The Future of Land and Agriculture: Trends and Challenges at 36 (2017) https://openknowledge.fao.org/server/api/core/bitstreams/2e90c833-8e84-46f2-a675-ea2d7afa4e24/content.
[29] CARB, Detailed Analysis of Indirect Land Use Change at I-8, I-16, https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf.
[30] *Id.* at I-8, I-25 (for corn ethanol, "production increment corresponds to increasing U.S. corn ethanol production from 3.41 billion gallons produced in 2004 to the 15 billion gallons authorized by the Energy Independence and Security Act of 2007."). *See also* UC Davis, Policy Institute for Energy, Environment and the Economy, Comments on Proposed Low Carbon Fuel Standard Amendments at 8 (Feb. 20, 2024).
[31] *Id.* at I-29; I-31: I-35.
[32] Renewable diesel, like biodiesel, is produced from the same renewable feedstocks such as vegetable oils, animal fats, or used cooking oil (UCO). The difference is that renewable diesel is produced using a hydrogen treatment which makes it chemically equivalent to petroleum diesel and can therefore be blended at higher levels and transported using existing pipelines.

altering shifts both domestically and to foreign feedstock trade."[33] Indeed, the share of biomass-based diesel ("BBD") credited under the LCFS program grew from 1 percent of total volumes in 2011 to 46 percent in 2022 and made up over half of compliance volumes in Q1 of 2023.[34]

Biofuels rely on feedstock availability. The selection of feedstocks for biofuel production primarily depends on the type of biofuel being produced and the technological requirements of the production process. For example, ethanol is typically produced from sugar or starch-based feedstocks such as corn, sugarcane, or sorghum because these materials are rich in sugars that can be easily fermented into alcohol. In the United States, corn is the predominant feedstock for ethanol, while in Brazil, sugarcane is predominant, although both can be used in E10 fuels.

Similarly, RD and BD are produced from lipid-based feedstocks like vegetable oils (soy, palm, canola), animal fats, and recycled greases. These oils and fats undergo processing where the lipid molecules are transformed into fatty acid methyl esters ("FAME") for biodiesel or hydrocarbons for renewable diesel. These processes require feedstocks with high lipid content, which make vegetable oils and animal fats ideal, but also highly interchangeable.

The volumes of available feedstocks for biofuels are limited by agricultural capacity, land use considerations, and competing uses for these feedstocks in food, feed, and industrial sectors. Increasing demand for biofuels has significant impacts on global markets and food costs. As more agricultural land is dedicated to biofuel feedstock production, there is less land available for food crops, which can lead to increased food prices and heightened food security concerns, especially in regions heavily dependent on agricultural imports.

Moreover, because crop-based oil markets are global and oils such as soy and palm are highly interchangeable, diversion of one type of oil for use as a biofuel can increase demand for another type of oil for other uses. As noted by the International Council on Clean Transportation ("ICCT") in its February 20, 2024 comments on the Proposed Amendments:

> When soybean oil is diverted from food, feed, and oleochemicals markets it is often substituted with palm oil;[35] this greatly increases its upstream emissions impacts because palm oil is often grown on high-carbon stock land….This risk is "especially [likely] if RFS program total biofuel mandates increase in the future."[36] Due to soy-palm substitution and

[33] USDA, Foreign Agricultural Service, U.S. Renewable Diesel Production Growth Drastically Impacts Global Feedstock Trade (June 2024), https://fas.usda.gov/data/us-renewable-diesel-production-growth-drastically-impacts-global-feedstock-trade.
[34] ICCT, Memo to CARB Staff Re: Soy oil market distortions under the LCFS program at 2 (Aug. 2023).
[35] Santeramo et al., Linking soy oil demand from the US Renewable Fuel Standard to palm oil expansion through an analysis on vegetable oil price elasticities, 127 Energy Policy 19-23 (Apr. 2019), https://www.sciencedirect.com/science/article/abs/pii/S0301421518307924.
[36] USEPA, Biofuels and the Environment: Third Triennial Report to Congress (External Review Draft) at IS-22, https://cfpub.epa.gov/ncea/biofuels/recordisplay.cfm?deid=353055.

> pressure that soy expansion places on other markets, soy [biomass-based diesel] BBD's ILUC emissions may even exceed that of fossil fuel.[37]

Global biofuel consumption has grown dramatically over the past two decades. According to an industry report on global bioenergy, biofuel production increased nine-fold from 2000-2018, with 160 billion liters (42 billion gallons) of biofuels produced in 2018.[38] A 2017 report by FAO found that "[b]etween 2000 and 2009, the consumption of vegetable oil for all purposes grew at an annual rate of 5.1 percent, while the consumption of vegetable oil for biofuel production grew at an annual rate of 23 percent," noting the increase in production of bioenergy crops has led to a conversion of considerable areas of forest into farmland.[39] Thus, the concern over the impacts of land use changes grows as biofuel demand increases. Land use change effects of biofuels can lead to climate-related effects, through intensification and conversion of carbon-rich areas (such as peatland or rainforests) which release carbon upon conversion to agricultural land. For this reason, the shock values CARB used to determine ILUC emissions matter in determining the severity of project impacts.

The relationship between biofuel volumes and ILUC impacts is further illustrated in EPA's 2023 evaluation of five different ILUC models to better understand the potential GHG impacts of increased use of biofuels. The evaluation, termed the Model Comparison Exercise ("MCE") looked at baseline uses of biofuels (2014 for the GTAP model) and what GHG effects an additional 1 billion gallons of ethanol or soy biodiesel would show across the five models.[40] The results showed that with increasing demand of crop-based feedstocks for biofuels, GHG emissions also increased. While CARB's previous study evaluated GTAP for similar effects, the EPA study used updated models and higher volumes of biofuels than CARB's earlier approach. The MCE results had two overarching conclusions. First, significant uncertainty exists across models. Increases in GHG emissions from land use change ranged from 10 $kgCO_2$/MMBTU for GTAP to 295 $kgCO_2$/MMBTU for the Applied Dynamic Analysis of Global Economy ("ADAGE") model.[41] These differences, according to EPA, are due to the sensitivity of each

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[37] ICCT, Comments on Proposed Low Carbon Fuel Standard Amendments (Feb. 20, 2024), https://www.arb.ca.gov/lists/com-attach/6886-lcfs2024-AmsCZwFjACcAWQJu.pdf.

[38] World Bioenergy Ass'n, Global Bioenergy Statistics 2020, https://www.worldbioenergy.org/uploads/201210%20WBA%20GBS%202020.pdf.

[39] FAO, The Future of Land and Agriculture: Trends and Challenges at 35-36 (2017).

[40] USEPA, Model Comparison Exercise Technical Document at 44, 113 (2023), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1017P9B.pdf. In LCFS carbon intensity units, this is a CI increase of 10.55 gCO2e/MJ to 311.23 gCO2e/MJ above the current LUC value for soy (1 g CO2e/MJ = 1.055 kg CO2e/MMBTU). As discussed below, the much smaller increase in carbon intensity in GTAP likely reflects that model's inability to assume biofuel production results in the conversion of unmanaged forest. Models like ADAGE that have this capability showed ILUC impacts that well exceed the carbon-intensity of fossil diesel.

[41] USEPA, Model Comparison Exercise Technical Document at 44, 113 (2023), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1017P9B.pdf. In LCFS carbon intensity units, this is a CI increase of 10.55 gCO2e/MJ to 311.23 gCO2e/MJ above the current LUC value for soy (1 g CO2e/MJ = 1.055 kg CO2e/MMBTU). As discussed below, the much smaller increase in carbon intensity in GTAP likely reflects that model's inability to assume biofuel production results in the conversion of unmanaged forest. Models like ADAGE that have this capability showed ILUC impacts that well exceed the carbon-intensity of fossil diesel.

model's framework and assumptions, meaning the system as a whole may not be understood enough to model with certainty. Second, all models showed that with increasing volumes of soy-based biofuel, greenhouse gas emissions from ILUC also increase. Even under the lower-end increase from increased biofuel production modelled in GTAP, ILUC emissions from soy diesel increase by approximately 36 percent from the 29.1 gCO_2e/MMBTU used by CARB in its environmental analysis.

Accordingly, CARB's failure to examine the impact of crop-based biofuels in light of significantly higher production volumes serves to understate impacts in direct contravention of CEQA's analytical requirements. Increased deforestation pressures from substantially increased production levels fundamentally compromise the integrity of CARB's environmental analysis in at least two ways.

First, under CEQA, existing environmental conditions "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." CEQA Guidelines § 15125(a). CARB relies on 2004 baseline levels of biofuel production from which it evaluates ILUC impacts, but the 2004 baseline production levels are far less than the levels of biofuels currently produced domestically, much less globally, and thus are not reflective of existing conditions. Indeed, despite their relevance in understanding Project impacts, the EIA's description of the environmental setting omits any reference to existing levels of crop-based biofuel production.[42]

Moreover, CARB has long been aware of the low quantities of biofuels modelled to assess ILUC impacts and the need for an updated analysis. In its FSOR for the 2018 LCFS Rulemaking, CARB recognized that "the GTAP model database used reflected the global economy when negligible quantities of inedible oil and tallow were used in biofuel production which limited contributions of these feedstocks to impact cross-product substitutions" and stated "Staff is committed to periodically updating life cycle analysis modeling tools and is committed to revisiting indirect effects analysis in a future rulemaking."[43] Yet despite skyrocketing biofuel production in the years following CARB's stated commitment, it failed to update shock values in this rulemaking to properly assess Project impacts.

Because biofuels are a global market[44] and the United States is now importing biofuels to meet RD demand, CARB further erred in only looking at domestic production. As FAO observes, where increased productivity cannot meet demand, "mandating the use of biofuels in one region may increase global GHG emission due to indirect land-use changes in locations where the biofuel feedstock is grown."[45]

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[42] *See* DEIA, Attachment A: Environmental and Regulatory Setting for the Proposed Low Carbon Fuel Standard.

[43] CARB, Final Statement of Reasons for 2018 LCFS Amendments at 484 (Nov. 2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/fsorlcfs.pdf?_ga=2.241016003.135030859.1728496245-198839816.1713644471.

[44] The close integration of the U.S. into international markets means that crop price changes in the U.S. caused by biofuels are reflected internationally. Roberts et al., *Identifying Supply and Demand Elasticities of Agricultural Commodities: Implications for the US Ethanol Mandate*, 103 Am. Econ. Rev. 2265 (2013).

[45] FAO, The Future of Land and Agriculture: Trends and Challenges at 36.

To comport with CEQA and properly analyze project impacts, CARB should have started with a shock value that represented existing global levels of crop-based biofuel production. As EPA states in its Model Technical Analysis, "soybean oil does have near perfect substitutes for many end uses, in the form of other vegetable oils."[46] Accordingly, a soybean oil shock could include other vegetable oil production levels as a means of understanding the carbon intensity of biofuel production at current levels.

From a baseline reflecting existing global levels of crop-based biofuel production, CARB should then have used shock values representing increased biofuel production both under the Proposed Amendments and when considered in the context of projected growth elsewhere. The Proposed Amendments are not the only driver of increased crop-based biofuel production and its associated impacts. In its July 2022 workshop, CARB recognized that "[c]lean fuels programs in Oregon, Washington, Canada, Brazil and EU will likely increase global demand for crop-based fuels."[47] CARB similarly stated in its November 2022 LCFS workshop that "[i]n light of expected increase in global production capacity, staff continues to evaluate the need for adjustments to prevent potential deforestation, land conversion, and adverse food supply impacts."[48] The International Energy Agency ("IEA") estimates that globally, "[b]iofuel demand is set to expand 38 billion litres [roughly ten billion gallons] over 2023-2028, a near 30% increase from the last five-year period."[49] As each billion gallons of soybean oil based renewable diesel requires about 15 million acres of land to grow - an area roughly the size of West Virginia – the potential cumulative impacts of increased global biofuel production are far from trivial. [50] Yet despite recognizing escalating land-use pressures from increased biofuel production from policies in other states and countries, CARB's cumulative impacts assessment is limited to assessing related projects under California's 2022 Scoping Plan.[51] Moreover, what cumulative analysis the EIA does conduct ignores the Project's cumulative effect on impacts from crop-based biofuels.

Indeed, the land pressures from crop-based biofuel production are a classic example of a cumulative impacts problem, with increased global biofuel production correlated to tropical deforestation, food insecurity, and other harms. The EIA's failure to "discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable" violates CEQA. Guidelines § 15130(a). In addition, even if the EIA had included a cumulative impacts assessment for biofuel production, limiting it to projects under the statewide Scoping Plan would be wholly inadequate particularly where, as here, CARB acknowledged potential impacts from

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[46] USEPA, Model Comparison Exercise Technical Document at 97.
[47] CARB, LCFS Public Workshop: Potential Changes to the Low Carbon Fuel Standard, Slide 36 (July 7, 2022), https://ww2.arb.ca.gov/sites/default/files/2022-07/LCFSWorkshop_Presentation.pdf.
[48] CARB, LCFS Public Workshop: Concepts and Tools for Compliance Modeling, Slide 28 (Nov. 9, 2022), https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentation.pdf.
[49] IEA, Renewables 2023, Analysis and forecast to 2028 at 94 (Jan. 2024), https://iea.blob.core.windows.net/assets/96d66a8b-d502-476b-ba94-54ffda84cf72/Renewables_2023.pdf. (38 billion liters equates to slightly over 10 billion gallons).
[50] Murphy, UC Davis Institute of Transportation Studies, https://its.ucdavis.edu/blog-post/making-policy-in-the-absence-of-certainty-biofuels-and-land-use-change/. *See also* Zhang et al., Grassland-to-cropland conversion increased soil, nutrient, and carbon losses in the US Midwest between 2008 and 2016, Environ. Res. Lett. 16 054018 (2021), https://iopscience.iop.org/article/10.1088/1748-9326/abecbe/pdf.
[51] DEIA at 141 *et seq*.

increased global production. Guidelines § 15130(b)(3) (requiring lead agencies to "define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used.").

CARB's assertion in the Response to Comments that a "lack of consensus and the time- and resource-intensive process that would be necessary to pursue a comprehensive reevaluation of land use change modeling" preclude it from updating ILUC impacts does not excuse its CEQA violations.[52] First, CEQA requires that impacts be analyzed based off existing conditions. Reliance on 10-year-old analysis that does not comport with existing and projected levels of crop-based biofuel production violates this fundamental requirement. Second, at a minimum, CARB could have updated shock values to reflect current and projected levels of biofuel production similar to EPA's analysis without undergoing a "comprehensive revaluation" of the model. Finally, this is the same excuse CARB has fallen back on in previous LCFS updates. As set forth above, following those updates, CARB committed to relook at ILUC but failed to do so, despite amendments in 2018 and 2019, and a four-year process for the current amendments.[53] CARB cannot continue to rely on the same excuse for reliance on woefully outdated information particularly where, as here, that reliance violates CEQA's analytic requirements.

B. The EIA Continues to Mislead Decision-Makers and the Public by Failing to Disclose the Fundamental Flaws in GTAP.

Even if the EIA correctly used existing and projected volumes of crop-based biofuel production to evaluate the Project's ILUC impacts, the EIA would continue to violate CEQA by failing to disclose the uncertainties and unsupported assumptions in GTAP. As discussed above, EPA evaluation of how different ILUC models respond to increased shock values yielded a range of results, with smaller increases under GTAP, and a large increase under ADAGE such that ILUC emissions exceeded those of fossil fuels.[54] This range of outcomes is because GTAP and other models rely on economic elasticities, which define the sensitivity of supply and demand to price changes. These elasticities are key inputs in determining how land use changes in response to changes in crop prices and production demand (such as from biofuels). However, the derivation of these elasticities is often entirely subjective or based on limited datasets, leading to questionable projections of land use change. As noted by prominent researchers, "[t]he GTAP-BIO model reflects the subjective expert opinion of a relatively small group of researchers. There is an apparent tendency for evidence that might support parameters leading to higher ILUC estimates to be robustly challenged by GTAP-BIO modelers, while weaker analysis that supports the generation of lower ILUC estimates has been readily accepted."[55]

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[52] Response to Comments at 14.
[53] CARB, Public Engagement to Inform Proposed Low-Carbon Fuel Standard Regulatory Updates.
[54] USEPA, Model Comparison Exercise Technical Document at 44, 113 (2023), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1017P9B.pdf. Converting from kgCO2eq/MMBTU (1 g CO2e/MJ = 1.055 kg CO2e/MMBTU). As discussed below, the much smaller increase in carbon intensity in GTAP likely reflects that model's inability to assume biofuel production results in the conversion of unmanaged forest. Models like ADAGE that have this capability showed ILUC impacts that well exceed the carbon-intensity of fossil diesel.
[55] Malins et al., *How robust are reductions in modeled estimates from GTAP-BIO of the indirect land use change induced by conventional biofuels?*, Journal of Cleaner Production 258 (2020) 120716.

Rather than only rely on GTAP using decade-old assumptions, CARB should have evaluated multiple models to determine whether they were adequate for use and based on peer-reviewed data, and whether the assumptions (such as elasticities) are calibrated to the volumes of biofuels being evaluated.[56] CARB should then have run multiple scenarios on models deemed adequate. Finally, CARB should have conducted uncertainty analyses for each model, such as Monte Carlo simulations.[57]

Moreover, rather than disclose key model shortcomings, the EIA attempts to hide them. For example, the DEIA states, "[a] fuel that is more likely to displace sensitive lands, such as forests, would have a higher LUC value, making it less attractive for use in complying with the Proposed Amendments."[58] While this would be the case if the model CARB used was capable of assessing the impact of biofuel production on displacement of sensitive lands, GTAP is unique among ILUC models in *not* having this capability. GTAP is "the only model with zero area of non-commercial land available for conversion to a commercial use."[59] GTAP's inability to account for biofuel production resulting in direct conversion of forests, savannas, and other carbon-rich ecosystems results "in lower overall CI estimates compared to when non-commercial land is represented and available for conversion."[60] With recent satellite data showing a clear trend of increasing deforestation and land conversion alongside rising soybean consumption in the biofuel sector, key GTAP assumptions are not supported by substantial evidence.[61]

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[56] Models use elasticities to predict the response of one variable based on another variable. In economic modeling, elasticities are generally derived using historical data, econometric techniques, and theoretical assumptions to estimate relationships between variables like price, supply, and demand. Because we have not seen the level of supply and demand for biofuels, it is at least questionable whether elasticities are static no matter the conditions. In fact, many elasticities can show non-linear behavior at extreme ranges of variables. Policy shifts can also affect elasticities, and we are seeing more policies to expand biofuels globally.

[57] In CARB's 2015 analysis, Monte Carlo simulations were used to assess uncertainties for the LUC factors. These simulations allowed CARB to evaluate how uncertainties in parameters like elasticities, land-use changes, and market responses might impact the carbon intensity scores of biofuels. These simulations are typically used to model a range of possible outcomes based on variations in input data, providing a more comprehensive understanding of potential impacts and risks. Monte Carlo simulations are a statistical technique used to model and understand the behavior of complex systems by simulating a large number of possible outcomes. The method is based on repeated random sampling to estimate the probable results of a process that has inherent uncertainty or variability. It's particularly useful in scenarios where models have high complexity or uncertainty in the system. CARB conducted 30 iterations, which is on the low end of what is considered sufficiently large. *See* William Oberle, Monte Carlo Simulations: Number of Iterations and Accuracy (July 2015), https://apps.dtic.mil/sti/tr/pdf/ADA621501.pdf.

[58] DEIA at 69.

[59] Plevin et al., Choice in land representation materially affect modeled biofuel carbon intensity estimates, Journal of Clean Production, 349:131477 at 2 (2022).

[60] *Id.*

[61] *See* Feng et al., Doubling of annual forest carbon loss over the tropics during the early twenty-first century 5 Nature Sustainability 441-451 (Feb. 2022), https://www.nature.com/articles/s41893-022-00854-3; Song et al., Massive soybean expansion in South America since 2000 and implications for conservation, 4 Nature Sustainability 784-792 (2021), https://www.nature.com/articles/s41893-021-00729-z.

While CARB acknowledged this limitation in the 2018 LCFS Updates, it subsequently did nothing to remedy this defect in evaluating ILUC impacts under the Proposed Amendments. In its FSOR for the 2018 LCFS update, CARB acknowledged that "[i]n GTAP-BIO, all forestry land is treated as producing timber, so the conversion of any forestry land results in a decline in timber output from the converted area, creating pressure elsewhere to increase timber production, counteracting some of the forest removal in terms of carbon emissions. If non-commercial forest land were available for conversion, this market-mediated effect would not occur, most likely resulting in an increase in LUC emissions."[62] CARB's exclusive reliance on a land use model that excludes deforestation as a potential result of increased biofuel production coupled with 10-year-old shock values serves to significantly understate project impacts and in not a supportable basis from which to assess ILUC impacts. Moreover, rather than disclose this limitation, the EIA improperly suggests that ILUC factors used by CARB account for deforestation when they do not. Moreover, CARB's own assertion that it did not model all the potential areas for feedstock production, along with the global nature of fuel production, shows that CARB should have revised its modeling to include ILUC estimates that accurately reflect the potential risks.[63]

C. The EIA Continues to Fail to Address Impacts of Increased Crop-Based Biofuel Production on Global Fuel Insecurity and Its Corresponding Impacts on Public Health.

As discussed in Earthjustice's comments on the RDEIA, the RDEIA ignores the health impacts of increased crop-based biofuel production from increased food insecurity.[64] Because the FEIA fails to remedy this fundamental defect, the EIA continues to violate CEQA. Moreover, CARB's response to Earthjustice's comments is wholly deficient, falling far short of CEQA's requirement that a lead agency provide "good faith, reasoned analysis" in response to comments. Guidelines § 15088(c).

The CARB's Response to Earthjustice's comments on the impact of increased biofuel production on global food insecurity is to refer to Master Responses 2 and 3."[65] Neither of these responses constitute a "good faith, reasoned analysis" response to Earthjustice's comment. Guidelines § 15088(c). Master Response 2 purports to address deforestation impacts from crop-based biofuel production and Master Response 3 states the CARB is not required to analyze speculative impacts without specifically addressing food insecurity.[66]

As an initial matter, the link between increased demand for biofuels and increased food insecurity is well-documented. As researchers have found, in a review of over one hundred economic modeling studies of the potential impact on prices from increased biofuel demand, "[t]he overwhelming consensus in the literature we surveyed is that, as predicted by basic

[62] CARB, LCFS Amendments to the Low Carbon Fuel Standard Regulation and the Regulation on Commercialization of Alternative Diesel Fuels, Final Statement of Reasons at 490 (Nov. 2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/fsorlcfs.pdf.
[63] Response to Comments at 14.
[64] Earthjustice RDEIA Comments at 8-9.
[65] Response to Comments at 349.
[66] Response to Comments at 12-17.

economics, biofuel demand (and hence biofuel policy) results in increased food prices."[67] The impact of increased food prices falls on poor households in the developing world the hardest. This is because "food consumption of poor households in the developing world is more sensitive to food commodity prices than consumption in the developed world is, and thus these poorer households will be disproportionately affected by food price increases caused by biofuel demand."[68] Accordingly, the evidence that increasing (or maintaining) demand for food-based biofuels can be expected to increase poverty and reduce food security is compelling."[69]

Indeed, the purported greenhouse gas benefits CARB claims from biofuel are premised on reduced demand for food due to lack of affordability. As CARB acknowledged in its 2014 Detailed Analysis of Land Use Change that is the basis of the ILUC factors CARB continues to use in assessing the impact of the Proposed Amendments:

> The LCFS, together with biofuel production mandates in the U.S. and Europe, will result in the diversion of agricultural land from food production to biofuel feedstock production. ***This diversion of agricultural land to biofuel production will exert an upward pressure on food commodity prices, and potentially lead to food shortages, increasing food price volatility, and inability of the world's poorest people to purchase adequate quantities of food.*** GTAP analysis predicts that price increases resulting from the additional demand for biofuels will result in reduced crop production, leading to lower food consumption.[70]

CARB cannot recognize the link between biofuel production and food insecurity and include the corresponding reduction in food demand to assess greenhouse gas emissions from biofuels while simultaneously asserting this is a speculative impact. As observed by leading researchers, "[p]olicy makers should give serious consideration to the balance between the environmental benefits delivered by biofuel policy and the incidental harm done through increased food prices."[71] Yet in failing to so much as disclose this impact, particularly, where, as here, it underpins the Project's ILUC analysis, the EIA precludes any such discussion and in direct contravention of CEQA, sweeps these serious concerns "under the rug." *Save the Hill Group v. City of Livermore* (2022) 76 Cal.App.5th 1092, 1108.

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[67] Malins, *Thought for food: A review of the interactions between biofuel consumption and food markets* at 3 (Sept. 2017), https://www.transportenvironment.org/uploads/files/Cerulogy_Thought-for-food_September2017.pdf.
[68] *Id.* at 8.
[69] *Id.*
[70] CARB, Detailed Analysis of Indirect Land Use Change at I-21 (2014), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf (emphasis added).
[71] Malins, *Thought for food: A review of the interactions between biofuel consumption and food markets* at 8 (Sept. 2017), https://www.transportenvironment.org/uploads/files/Cerulogy_Thought-for-food_September2017.pdf.

D. The EIA Fails to Adopt All Feasible Mitigation Measures to Reduce Impacts from Increased Biofuel Production.

1. Adding Sunflower Oil to the Virgin Oils Subject to the Credit Limit Is Insufficient to Address Resource Shuffling.

Earthjustice's comments on the RDEIA explained the importance of extending the 20 percent limit on crop-based fuel production to all virgin oils rather than only soybean and canola oil to prevent resource shuffling given the interchangeability of vegetable oils.[72] CARB's addition of only sunflower oil to the 20 percent limit in its second set of 15-day changes to the Proposed Amendments fails to adequately address this concern. By not including all oil feedstocks, including corn oil, the Proposed Amendments continue to enable resource shuffling through the substitution of other virgin oils.

Other sources of edible oil for biodiesel production include rapeseed, peanut, olive, coconut, mustard, and linseed,[73] and current corn-based fermentation facilities could be converted to make drop-in fuels.[74] Yet, CARB has not evaluated what feedstocks would replace soy, canola, and sunflower. CARB also stated that the credit limit is meant to "[avoid] sending a long-term signal for virgin soy or canola oil to serve California demand."[75] However, the issues on food insecurity and deforestation are not limited to soy and canola oil. Further, CARB states that "[t]he State must ensure that other regions are able to also access increasing volumes of low-carbon alternative fuels."[76] Yet, by failing to put an overall limit on biofuels, producers will likely continue to send fuel to California, as shown by CARB's own modeling.[77] Producers may not even be limited in virgin oil volumes because of the ease of feedstock switching.

2. Assigning Excess Crop-Based Oils the Benchmark CI Is Ineffective in Deterring Production.

As Earthjustice explained in comments on the RDEIA, CARB's proposal to assign biofuel volumes that exceed 20% of virgin oil feedstock the compliance benchmark CI is at best a short-term signal that fails to provide the necessary disincentive for long-term change.[78] This is because assigning excess volumes the benchmark CI still offers an advantage to biofuel producers. Though these excess volumes won't generate credits in the LCFS, they also do not

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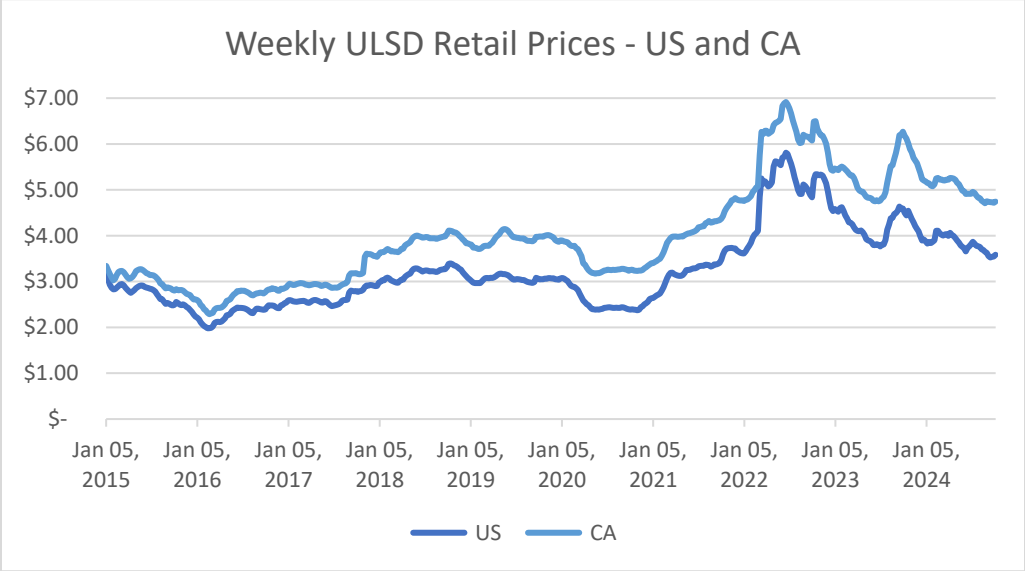
[72] Earthjustice RDEIA Comments at 16.
[73] Ambat et al., Recent advancement in biodiesel production methodologies using various feedstock: A review, 90 *Renewable and sustainable energy reviews* 356-69 (2018), https://www.sciencedirect.com/science/article/abs/pii/S1364032118301588.
[74] *See* Targray, Feedstock Supply for Biodiesel and Renewable Diesel Producers, https://www.targray.com/biofuels/feedstock ("First-generation biofuel is produced from vegetable oils and food crops such as palm, rapeseed, soy, beets and cereals like corn and wheat.").
[75] CARB, Notice of Public Availability of Modified Text and Availability of Additional Documents for Frist 15-Day Changes at 4 (Aug. 12, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_notice.pdf.
[76] *Id.*
[77] In the CATS output for the 15-day Proposal, CARB shows BD/RD will continue to be used in CA, even when deficit-generating. See Virgin Oils credit quantity and Waste Oils credit quantity, https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day_Proposed_9step_30_final_posted_0.xlsx. (Starting in 2034, virgin is deficit-generating.)
[78] Earthjustice RDEIA Comments at 13-14.

generate deficits. Producers can continue delivering biofuels to California without facing a strong enough penalty to deter production.

Assigning excess biofuel volumes the benchmark CI (which means these fuels generate neither credits nor deficits in the LCFS) is not ineffective in limited increased production of virgin feedstocks because producers continue to benefit from other incentives including federal subsidies[79] and lower California's Cap-and-Trade ("C&T") compliance obligations.[80] In addition, as shown below in Figure 1, retail prices for diesel in California are higher than the rest of the United States, creating an additional incentive to produce biofuels for the California market.

Figure 1[81]



In contrast, assigning excess volumes the CI of fossil diesel would serve as effective mitigation by providing a more robust deterrent. By equating virgin oil biofuels to fossil diesel in the LCFS, CARB would send a clearer signal that biofuels exceeding the 20 percent threshold carry similar LCFS compliance burdens as fossil diesel. This approach would increase the compliance cost, creating a stronger incentive to reduce reliance on virgin oils. Furthermore, even with continued federal support through the RFS and BTC/PTC, and lower C&T obligations, the higher compliance cost associated with the diesel CI would significantly reduce the attractiveness of biofuel production beyond the 20 percent limit.

The fact that biofuels will eventually become deficit-generators under the Program as the benchmark CI decreases over time is insufficient by itself to limit their supply into California absent assignment of the CI of fossil diesel for excess production. First, even if virgin oil

[79] Including the Blender's Tax Credit/Producer's Tax Credit of $1/gallon, Section 48 IRS Tax Credit up to 30%, and RFS RIN credit prices, currently around $1/RIN.
[80] Biofuels are considered "biogenic" and do not count toward GHG emission thresholds for cap-and-trade compliance purposes. 17 Cal. Code of Regs § 95852.2(a).
[81] USEIA, U.S. On-Highway Diesel Fuel Prices*(dollars per gallon), https://www.eia.gov/petroleum/gasdiesel/.

biofuels generate deficits due to the declining benchmark CI, the compliance burden will still be much lower than that of fossil diesel. For example, virgin oil biofuels have a CI of around 60 gCO2e/MJ,[82] whereas the CI of fossil diesel is 105.76. The cost of compliance for biofuel producers would still be lower than for fossil diesel, meaning that generating deficits on biofuels remains a more attractive option than producing fossil diesel, even as the benchmark declines. As demonstrated in Table 1 below, according to the current benchmark schedule, the policy would be effective for 5 years from 2028 to 2032. In 2033 the CI of oils above and below the limit would become equivalent. If one or more AAMs are triggered, the policy shortens. Accordingly, CARB's assertion in its Response to Comments that the 20 percent limit "avoids sending a long-term signal for virgin soy, or sunflower oil to serve California demand" is wholly without merit as the minimal disincentive of the benchmark CI score will sunset by no later than 2033.[83]

Table 1: Carbon Intensity of Oil Volumes Above and Below the 20% Limit Over Time without AAM Trigger.

CARB Proposal	**CI for volumes <20%**	**CI for volumes >20%**[84]
2025-2027	60	60
2028	60	77.10
2029	60	75.57
2030	60	74.03
2031	60	69.27
2032	60	64.51
2033	60	60

Second, CARB's modeling shows that biofuels will continue to be supplied even after the benchmark declines to a point where biofuels begin generating deficits.[85] This suggests that the incentives to continue producing biofuels, even at a deficit, outweigh the disincentives created by assigning the benchmark CI. Therefore, simply assigning the benchmark CI to excess volumes is

[82] BD/RD CI is an average of non-retired, approved soy and canola CI pathways: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx
[83] Response to Comments at 12-13.
[84] The CI values for 2028-2032 reflect CARB's proposed benchmark CI for diesel, as provided in the "LCFS Benchmark" tab of the modeling input sheet https://ww2.arb.ca.gov/sites/default/files/2024-08/scenario_inputs_15Day_Proposed_9step_30_final_posted_0.xlsx. In 2033, the benchmark CI for diesel is 59.75. The regulation states that the CI for volumes over 20% will be assigned the higher of the actual CI or the benchmark CI.
[85] *See* CATS output for 15-day changes, https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day_Proposed_9step_30_final_posted_0.xlsx.

not enough to stop producers from supplying biofuels over the 20% limit. Once the benchmark CI is below 60, all virgin oil fuels become deficit generating. However, from CARB's California Transportation Supply ("CATS") output, there is not a noticeable drop in RD consumption expected.

Other stakeholders, including ICCT, have also raised concerns with the ineffectiveness of the CI Benchmark. As set forth by ICCT:

> The *de facto* penalty for exceeding the crediting limit ranges from approximately $0.06 to $0.23 per diesel-gallon equivalent (DGE) depending on the year, before going away entirely. If these fuels were treated as having a CI of the fossil baseline, their effective penalty would $0.55 per DGE, creating a stronger disincentive for exceeding the limit. In short, this small penalty is not expected to meaningfully change producer behavior given that it is far lower than the sum of incentives renewable diesel sold in California receives.[86]

Accordingly, CARB's failure to apply the fossil diesel benchmark to excess virgin oil fuels falls short of CEQA's mitigation requirements.

In rejecting this mitigation measure in the FEIA Response to Comments, CARB talks out both sides of its mouth. In Master Response 2, CARB states that the "20 percent value is based on historical reported data under the LCFS program" and rejects the suggestion this provision would increase consumption of fossil diesel as "speculative."[87] Yet elsewhere in the Response to Comments, CARB rejects assigning ULSD to surplus oils as it "would likely increase diesel production and increase both GHG emissions and air pollution."[88] Even if CARB's claims that diesel production would increase despite its earlier insistence any such increase is speculative, as CARB elsewhere recognizes, the purpose of the 20 percent limit is to "serve as a guardrail against potential future land conversion or deforestation."[89] To serve as a guardrail, the provision must be effective.

Moreover, CARB already assigns palm oil a CI near that of fossil diesel to "send a strong signal that disincentivizes use of this fuel."[90] CARB currently assigns palm oil feedstocks a LUC value of 71.4, which would result in a CI of any palm-based fuel near to or even higher than the fossil CI. Because of this, CARB has stated they have no reported palm-based fuels in the program. This has sent an appropriate long-term signal, unlike the proposal to put then annual benchmark CI for other fuels CARB is trying to disincentivize in California. CARB is proposing

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[86] ICCT, Comments on Second Notice of 15-day changes to the Proposed Regulation Order (Oct. 16, 2024).
[87] Response to Comments at 13.
[88] Response to Comments at 358.
[89] Response to Comments at 13. Moreover, as described in Earthjustice's RDEIA comments, CARB's claim that renewable diesel provides GHG and air quality benefits compared to fossil diesel suffers from numerous analytical flaws that are compounded by the inability of its model to assess how redirecting funding from biofuels to electric vehicles could provide superior benefits.
[90] Proposed Amendments to the Low Carbon Fuel Standard Regulation, Appendix E: Purpose and Rationale of Proposed Amendments to the Low Carbon Fuel Standard Requirements at 13 (Jan. 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appe.pdf.

to modify the palm oil CI to be equivalent to that of fossil diesel in the proposed regulation. Due to the interchangeability of vegetable oils, increasing biofuel demand for soy and other virgin oils increases demand for palm oil for non-biofuel uses. As ICCT notes:

> Soy oil market distortion will impact other vegetable oil markets due to the fungibility of vegetable oils in food and feed markets and in consumer products. Relative to other feedstocks, palm and soy oil are particularly cross-price elastic, meaning that palm oil supply is responsive to changes in the price of soy oil. Using a regression model, Santeramo and Searle identified a causal relationship between increased soy biodiesel demand and increased palm oil imports in the United States between 1992 and 2016.[91]

Accordingly, assigning the excess production of all virgin oils the CI of fossil diesel like CARB proposes for palm oil is both necessary and appropriate given similar harms from increased demand for use of these crops for biofuels.

III. CARB Continues to Fail to Address the Flaws in Its Emissions Analysis of Biofuels Combustion in California Vehicles.

CARB's Response to Comments and the FEIA fail to remedy flaws in its air quality analysis that have led to systematic undercounting of criteria pollutant emissions from the Proposed Amendments. These flaws in the EIA undermine its purpose as an informational document and render inadequate any mitigation of these impacts.

A. CARB Fails to Justify Claimed Emissions Reductions.

Notably, in the Response to Comments, CARB changes its assessment that "almost all" emissions benefits results from use of RD and BD in legacy engines to "the majority," as excerpted here:[92]

> used in NTDE engines. The majority ~~Almost all~~ of the air quality and health improvements that come from the tailpipe emissions reductions from the Proposed Amendments and subsequent increased biofuels use are a result of these additional PM reductions from increased RD and BD use in legacy engines, a conclusion that is supported by the results of the 2021 LED study.

The Response to Comments concedes that "[g]iven the much higher PM emission rates in legacy engines, when RD and BD are used in legacy engines, the RD and BD results in a much more significant total reduction of emissions and much more significant health benefits than when the same fuel is used in new technology diesel engines ("NTDE") engines."[93] Given that "majority" can mean 50.01%, the environmental analysis fails to articulate where the other purported benefits are created. In fact, the Response to Comments concedes "[t]he most significant health and air quality improvements from the use of RD and BD come from the use of these fuels, as opposed to fossil ULSD, in legacy engines..."[94] The analysis fails to explain the

[91] ICCT, Memo to CARB Staff: Soy oil market distortions under the California LCFS Program at 8 (Aug. 2023).
[92] Response to Comments at 366
[93] Response to Comments at 365-366.
[94] Response to Comments at 365.

source of the additional emissions reductions above and beyond "the majority" it claims occurs by burning RD and BD in combustion engines.

Similarly, the CEQA analysis also fails to articulate whether this analysis is double-counting any purported emissions benefits from other regulations that require use of RD.[95] In its April 10 workshop presentation, CARB failed to show how the LCFS regulation is the primary driver of additional RD that is needed to offset increased NOx from BD when other regulations require use of RD in large swaths of offroad equipment.[96]

As noted in prior comments, the CEQA analysis is also flawed because it integrates the federal RFS and tax credit incentives into the production cost inputs for renewable diesel and biodiesel in the California Transportation Supply ("CATS") model for both the baseline and analyzed scenarios to isolate the impact of the LCFS and ensure that production changes reflect the additive value of the LCFS. Therefore, the change in RD and BD volumes between the baseline and proposed scenario is estimated as a result of the additional incentive provided by LCFS.

The environmental analysis is also faulty because it uses the CATS model to determine fuel volumes and emissions benefits from the LCFS. The model was developed to show least-cost compliance paths for meeting California's LCFS benchmarks by assigning the lowest-cost alternative fuels first, up to the volume required to meet the annual CI target. It was not designed to develop emissions benefits.

Moreover, by constraining the baseline used in the CEQA analysis to simply meet the compliance requirements, the model is not capable of showing volumes that might enter California regardless of the LCFS, thus underestimating what might occur in the absence of the LCFS and making the difference between the Proposal and baseline volumes artificially higher. Volumes of alternative fuels are likely to be used in California even without the LCFS. The Renewable Fuel Standard and federal tax credits will continue to mandate or encourage these fuels, and CA-specific regulatory requirements such as RD use requirements in California's offroad rule and reduced Cap and Trade obligations will continue to drive fuel availability and supply into California.[97]

Therefore, the past approach in prior CEQA analysis for prior LCFS amendments, which apportioned benefits to the LCFS is more appropriate to present an accurate depiction of the impacts of this decision.[98] Alternatively, one could model RFS prices at $0 to determine the

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[95] See, e.g., Cal Code of Regs. tit. 13 sec. 2449.1.

[96] CARB, Workshop Presentation (April 10, 2024), Slides 24-29, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_attd.pdf (showing that CARB assumes PM reductions for NTDEs in both BD and RD, when the study shows they are not different from fossil.). CARB assumes no NOx increases for NTDEs using BD, when the 2021 LED study shows increases. Any assumptions for NTDE emissions will have a large effect since 81% of all VMT (2024) is with NTDEs versus legacy engines, and will be 90% by 2032. See https://ww2.arb.ca.gov/sites/default/files/2024-09/NTDEv.nonNTDE%20vehicle%20split.xlsx.

[97] Moreover, the Renewable Identification Number prices in the model are not dynamic, such that, like the LCFS, volumes of biofuel attributable to the RFS are not dynamic, which is not modeled in CATS.

[98] *See* CARB Selected Response to Earthjustice's Public Records Act Request.

volume of fuel that the LCFS would deliver. The LCFS acts to incentivize the lowest-CI fuel to be used in California because, unlike the RFS, it rewards incremental CI reductions.

B. CARB Fails to Justify Its Decision to Disregard the Findings of Its Own 2021 Study.

As explained in prior comments, CARB's 2021 Low Emissions Diesel ("LED") study found that, in NTDE engines:

- BD NOx has higher emissions than fossil diesel.
- RD NOx has similar emissions to fossil diesel.
- RD cannot offset BD NOx impacts.
- BD and RD have PM emissions similar to fossil diesel.[99]

The study notes the fuels tested complied with the ADF regulation except for the cetane number, which is higher than ADF specification requirements. According to CARB, the cetane number can affect the NOx emissions levels, with very high cetane diesel fuels offsetting or reducing biodiesel NOx emissions.[100] According to the EIA, soybean oil has a lower cetane number than other feedstocks, similar to ULSD.[101]

CARB's efforts to write off this analysis by noting staff is engaging in "further research" to determine whether these alarming findings are "applicable" does not comply with CEQA's mandate to take an approach that is most protective of the environment.[102] To the extent "further research" is needed, CARB must take a conservate approach in the interim, based on its most recent findings. The approach is further outrageous because the 2021 LED study emanated from the ADF and 2018 LCFS amendments to confirm assumptions that biofuels in NTDEs would not have an adverse effect on PM and NOx.[103] Now, staff is conveying that the results are inadequate because it could lead to potentially significant emissions impacts that would need to be mitigated. This attempt to sweep important findings under the rug violates CEQA.

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[99] CARB, Low Emission Diesel Study: Biodiesel and Renewable Diesel Emissions in Legacy and New Technology Diesel Engines (Nov. 2021), https://ww2.arb.ca.gov/sites/default/files/2021-12/Low_Emission_Diesel_Study_Final_Report_12-2921.pdf.

[100] CARB, Appendix B: Final EA for the LCFS and ADF Regulations (2015) at 30, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2015/lcfs2015/environmentalanalysis.pdf

[101] USEIA, Biodiesels produced from certain feedstocks have distinct properties from petroleum diesel (May 3, 2018), https://www.eia.gov/todayinenergy/detail.php?id=36052.

[102] CEQA must be interpreted in such a manner as to afford the fullest possible protection of the environment. *See Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1106–7; *Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal. 3d 247, 259.

[103] Also, in the 2015 ISOR for the ADF regulation, Staff proposed "a review to be completed by December 31, 2019 in order to make sure that the offsetting factors are on track and that the in-use requirements for biodiesel are operating as expected." CARB, ISOR for Proposed Regulation on the Commercialization of Alternative Diesel Fuels (2015), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2015/adf2015/adf15isor.pdf

C. CARB Fails to Justify Its Decision to Lock Biodiesel Volumes at 2022 Levels.

CARB's decision to "lock[] in" BD volumes at 2022 volumes in the modeling lacks a sound justification.[104] Figure 2 depicts an excerpt of the modeling spreadsheet in which CARB staff overrode the model and locked in 2022 BD volumes into all future BD volumes, thereby preventing the air quality modeling to find any future BD growth and emissions associated with that growth.

Figure 2: Excerpt of CARB Modeling Inputs for 15-Day Package[105]

108	2022	Biodiesel	35463211159	inf	2022 gallons	281163967
109	2023	Biodiesel	35463211159	inf	Lock at 2022 volumes	
110	2024	Biodiesel	35463211159	inf		
111	2025	Biodiesel	35463211159	inf		
112	2026	Biodiesel	35463211159	inf		

CARB fails to address the fact, asserted in our September 30 comments, that BD is a lower cost fuel that the cost-optimizing CATS model would likely select if CARB had not read in volumes as stable to override such an outcome. While it may be the case that BD volumes have remained steady or declined in the past "several" and "two years," respectively, past trends are not evidence of future market changes. In fact, as noted in prior comments, CARB has consistently failed to predict biofuels volumes, wildly underestimating the future growth of RD in recent years. There is no assurance here that steady BD volumes are a certainty such that any future growth, and the associated potential for health-harming NOx increases, should be overridden by staff in the model. Under the conservative approach required by CEQA, CARB must analyze and mitigate the Project's potential air quality impacts. Because BD growth is possible and reasonably foreseeable, CARB should have modeled and disclosed its effects. Instead, CARB assumed away any growth and turned a blind eye to the possibility of NOx increases and the need for mitigation.

D. CARB Improperly Relies on the Alternative Diesel Fuel Regulation to Mitigate Concerns about Air Quality Impacts.

CARB states in its Response to Comments that "CARB currently implements a Regulation on the Commercialization of Alternative Diesel Fuels (ADF regulation), which is designed to ensure that the use of biodiesel blends do not result in excess NOx emissions relative to ULSD."[106] For numerous reasons, this response fails to address the problems with NOx that we raised in our prior comments.

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[104] Response to Comments at 364.
[105] CARB, Modeling Input Sheets from 15-day Package, Production Limits tab at cell E109, https://ww2.arb.ca.gov/sites/default/files/2024-08/scenario_inputs_15Day_Proposed_9step_30_final_posted_0.xlsx.
[106] Response to Comments at 366 (citing Title 13, Cal. Code Regs., §§ 2293 et seq.); see also CARB,

First, CARB designed the ADF regulation to sunset when specific measures are met for on-road and off-road equipment. In fact, CARB Staff previously determined that the on-road sunset would likely occur in 2023, consistent with previous analyses, while the off-road sunset would likely occur in 2030 or later, saying, "[t]his proposed amendment would mitigate potential future NOx emissions increases due to biomass-based diesel use attributed to the LCFS."[107]

Second, the ADF Regulation has not adequately accounted for NOx emissions because it does not incorporate the findings of the 2021 LED study. While the study was published in 2021 CARB could have been aware of its core findings before it updated the ADF in 2020.[108] Public records show that it was aware of preliminary findings in 2020. Yet the regulation ignores its results. And in any event, CARB has failed to update the ADF regulation based on the critical 2021 data indicating that RD does not offset the NOx emissions from BD in new technology diesel engines.

Third, and perhaps most importantly, there are currently no ADF additives that are certified as effective to mitigate the NOx increases from biodiesel use. CARB's own documentation shows the additives contemplated by the ADF regulation have not been effective. Although CARB certified six additives to mitigate the NOx impacts of biodiesel in accordance with the 2016 ADF regulation, in October 2019, CARB issued a Product Alert for fuel additives, noting none met the NOx standards.[109] The Product Alert allowed continued use of the certified additives to meet ADF NOx compliance. In addition, CARB posts volumes of biodiesel blends used in California beginning in 2016; however, these reports have not been published since 2020.[110] Therefore, one year after the additives were found ineffective, reporting of biodiesel blend volumes inexplicably stopped. CARB has not evaluated the NOx impacts given the NOx-mitigating additives previously certified were not effective, although allowed to be used for

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Appendix B: Final EA for the LCFS and ADF Regulations, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2015/lcfs2015/environmentalanalysis.pdf.

[107] CARB, Appendix D: Final EA for the LCFS and ADF Regulations at 3, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/finalea.pdf?_ga=2.156816696.2031453169.1708908111-1500701763.1655066223; *see also* CARB, Appendix G: Draft Supplemental Disclosure Discussion on NOx Potentially Caused by the LCFS Regulation (March 6, 2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/appg.pdf?_ga=2.65713197.2031453169.1708908111-1500701763.1655066223; CARB, Final Supplemental Disclosure Discussion on NOx Potentially Caused by the LCFS Regulation (Sept. 17, 2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/rtcea.pdf.

[108] CARB amended the ADF in 2020 to "reinforce the emissions certification testing requirements and require biodiesel additives and ADF formulations to be uniformly certified according to new certification procedures." It stated that "[t]he proposed amendments ensure the efficacy of additives or ADF formulations certified to mitigate potential oxides of nitrogen (NOx) emissions increases from the use of biodiesel. *See* CARB, ADF Rulemaking, https://ww2.arb.ca.gov/our-work/programs/alternative-diesel-fuels/alternative-diesel-fuels-rulemaking-history. see also, CARB, Selected Response to Earthjustice's Public Records Act Request.

[109] CARB, Product Alert: Fuel Additives (Oct. 31, 2019), https://ww2.arb.ca.gov/sites/default/files/2019-10/ADF_Product_Alert_10-31-19.pdf.

[110] CARB, Alternative Diesel Fuels Reporting Summaries, https://ww2.arb.ca.gov/sites/default/files/2019-10/ADF_Product_Alert_10-31-19.pdf (showing no reporting after 2020).

compliance through mid-2021. Nor has CARB explained how it is mitigating the NOx not controlled by the additives.

These flaws render the CEQA analysis a failure as a disclosure document in masking serious and real air pollution harms.

IV. CARB Continues to Fail to Address the Violations Associated with Its Analysis and Disclosure of Localized Impacts from Biofuel Production and to Adopt All Feasible Mitigation Measures.

CARB concludes that the Project's long-term operations could result in significant and unavoidable impacts to air quality.[111] Despite this acknowledgment, CARB (1) fails to adequately disclose or analyze a wide range of emissions, (2) relies on outdated health impact assumptions, and (3) fails to provide sufficient information about the magnitude and severity of health-harming emissions. These deficiencies violate CEQA, and CARB's Response to Comments and FEIA fail to remedy these violations.

A. The EIA Fails to Analyze Emissions of Numerous Health-Harming Pollutants from Biofuels Production.

Throughout all the environmental review documents for the Proposed Amendments, CARB limits its quantitative and qualitative analysis of health-harming air pollutants to PM2.5 and NOx emissions.[112] The DEIA relies on the air quality analysis methodology in the "Health Impact Analysis" conducted in the Standardized Regulatory Impact Assessment ("SRIA").[113] In the first 15-day change, CARB conducted additional modeling of air quality which it presents in the RDEIA. The FEIA provides no additional air quality modeling even though Earthjustice and other commenters pointed out numerous flaws including CARB's failure to provide quantitative assessments for pollutants other than PM2.5 and NOx emissions.[114] The RDEIA claims that "reduction[] in criteria pollutants and air toxics" is expected, while also acknowledging that biofuel production "may result in criteria pollutant and other emissions."[115] Yet the RDEIA fails to identify any specific air pollutants beyond PM2.5 and NOx and fails to disclose how emissions of pollutants other than PM2.5 and NOx would either increase or decrease as a result of the Proposed Amendments.[116]

CARB's lack of analysis is jarring given that evidence shows that many other types of air pollutants caused by the Project could have significant impacts. For example, as explained in prior comments,[117] facilities that manufacture hydrogen from methane using steam-methane reformation—which is an input to biofuels refining and which CARB admits are likely to

[111] RDEIA at 52-55; SRIA, Appendix B-2.
[112] RDEIA at 45-53, DEIA at 52-65, ISOR at 38-54, Appendix C-1: Standardized Regulatory Impact Assessment (hereinafter "SRIA"), Appendix B at 1-12.
[113] RDEIA at 45-53, DEIA at 52-65.
[114] SRIA, Appendix B at 1-12.
[115] RDEIA at 44, 52-53.
[116] RDEIA at 44; RDEIA at 52-53.
[117] Earthjustice, September 30, 2024 Comments at 29.

increase as a result of the Project[118]—emit not only PM2.5 and NOx but also other pollutants harmful to human health. The Bay Area Air Quality Management District, for example, has identified several additional toxic air contaminants as well as specific polycyclic aromatic hydrocarbons reported in steam-methane reformation emissions that CARB failed to analyze for their specific emission rates and potential impacts.[119] Several of these pollutants are known to pose specific health risks, such as carbon monoxide and volatile organic compounds.[120] The EIA does not justify its omission of these other air pollutants, nor does the EIA disclose that pollutants other than NOx and PM2.5 are emitted by steam-methane reformation.

Additionally, biofuel refining itself—which would also increase as a result of the Proposed Amendments[121]—releases significantly greater amounts of certain hazardous air pollutants than petroleum refineries.[122] These include carcinogens like formaldehyde and acetaldehyde as well as hexane and acrolein, which can cause nerve damage and lung and eye irritation, respectively.[123] In fact, more acrolein is emitted from the biofuels industry than any other sources in the U.S., according to EPA's Toxics Release Inventory.[124] These four pollutants also contribute to the formation of ground-level ozone, or smog, which is linked to a wide variety of respiratory ailments; as well as microscopic, soot-like particulates that can trigger heart and asthma attacks.[125]

Biofuel refining can also worsen acute air pollutant exposures as a result of refinery flares.[126] This is supported by site-specific evidence: Since the conversion of the Phillips 66

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[118] RDEIA at 31 ("Potential compliance responses to the Proposed Amendments could include the construction of new or expanded hydrogen production facilities, using steam methane reformation, electrolysis, or gasification technologies.").

[119] The Air District calculated TAC emissions for a hydrogen facility. Bay Area Air Quality Management District ("BAAQMD"), Engineering Evaluation Report Application No. 12842: Chevron Energy and Hydrogen Renewal Project (Sept. 19, 2008) at pdf page 83 – 84; BAAQMD, Emission Inventory for the Chevron Richmond Refinery: Chevron Products Company – Abated Criteria Pollutant Emissions for Calendar Year 2008 (Aug. 1, 2013); *see also* Pamela L. Spath et al., Life Cycle Assessment of Hydrogen Production via Natural Gas Steam Reforming, National Renewable Energy Laboratory (Feb. 2001).

[120] *See* Sun et al., Criteria Air Pollutants and Greenhouse Gas Emissions from Hydrogen Production in U.S. Steam Methane Reforming Facilities, Env't Sci. & Tech., Vol. 53 Issue 12, (May 24, 2019) ("Sun et al."), https://pubmed.ncbi.nlm.nih.gov/31039312/; Center for Disease Control, Polycyclic Aromatic Hydrocarbons (PAHs), https://www.epa.gov/sites/default/files/2014-03/documents/pahs_factsheet_cdc_2013.pdf.

[121] RDEIA at 52-53 ("proposed Amendments would result in shifting fuel production activities and the establishment of new fuel production. This production or combustion of individual alternative fuels in specific applications may result in criteria pollutant and other emissions.").

[122] Environmental Integrity Project, Farm to Fumes: Hazardous Air Pollution from Biofuel Production (June 12, 2024) (hereinafter "EIP Report") at 3, https://environmentalintegrity.org/wp-content/uploads/2024/06/EIP_Report_FarmtoFumes_06.12.2024.pdf.

[123] EIP Report at 3.

[124] EIP Report at 3. Data from EPA's 2020 National Emissions Inventory, reported by biofuel facilities EIP identified, available at https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data.

[125] *Id.*

[126] Blundell at al., Natural Gas flaring, respiratory health, and distributional effects, Journal of Public Economics 208 (2022); *see also* Tran et al., Air Quality and Health Impacts of Onshore Oil and Gas

Rodeo and Marathon Martinez refineries from petroleum to biofuel, several flaring incidents have been reported at the refineries.[127] At these sites, refinery flaring released spent catalyst chemicals, heavy metals, and diesel fuel onto adjacent communities.[128] Despite these documented air quality emergencies, CARB does not disclose or analyze biofuel refinery flaring impacts on air quality.

Relatedly, CARB acknowledges potential air quality impacts from transportation of feedstock to biofuels refineries,[129] yet fails to analyze and quantify these impacts. Transportation of biofuel feedstock is associated with the emission of several criteria pollutants such as diesel particulate matter and PM10 that CARB failed to analyze.[130] These effects will be heightened and concentrated in communities near refineries. CARB could have quantified these transportation emissions by analyzing expected biofuel volumes to determine the amount of feedstock needed to determine the number of trucks needed to transport the feedstock. Instead, CARB merely offers conclusory statements.

CARB could have, and should have, analyzed these foreseeable emissions; the agency's failure to disclose or account for air contaminants beyond PM2.5 and NOx violates CEQA. *See, e.g., Sierra Watch v. County of Placer* (2021) 69 Cal.App.5th 86, 98–99 (finding EIR inadequate because it failed to evaluate a category of pollutants that would result in environmental impacts due to increased vehicle miles traveled resulting from the Project). CEQA obligates agencies to collect information necessary to identify significant environmental impacts and propose feasible mitigation measures. *Sierra Club v. Board of Forestry* (1994) 7 Cal.4th 1215, 1220. Without the required information, the court in *Sierra Club v. Board of Forestry* concluded, meaningful assessment of a Project's impacts under CEQA is impossible. *Id.* Here, CARB's inadequate disclosure and insufficient analysis of health-harming air pollutants precludes a legally sufficient analysis of air quality impacts.

B. CARB Fails to Adequately Support Its Emissions Estimates.

The air quality emissions analysis CARB does provide is flawed and based on outdated, misleading data. As mentioned above, the EIA bases its analysis of NOx and PM2.5 emissions on the Health Impact Analysis evaluation conducted in 2023 in connection with the SRIA and on modeling of air quality impacts of the first 15-day changes. However, the Proposed Amendments

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Flaring and Venting Activities Estimated Using Refined Satellite-Based Emissions, Geo Health, 8 (Jan. 31, 2024).

[127] *Id.*

[128] Lauer, *Biofuel is poised to usurp crude oil refining in the Bay Area. But are their 'renewable' fuels a green solution or 'greenwashing'?*, EAST BAY TIMES (Feb. 4, 2024), https://eastbaytimes.com/2024/02/04/biofuel-is-poised-to-usurp-crude-oil-refining-in-the-bay-area-but-are-their-renewable-fuels-a-green-solution-or-greenwashing/; *Health officials conduct surprise inspection at Martinez refinery after recent incidents*, ABC7 NEWS (Dec. 26, 2023), https://abc7news.com/martinez-refining-company-surprise-inspection-refinery-flaring-air-quality/14228185/; Goldberg*, Federal Agency Probes Marathon's Martinez Refinery After Two Large Fires Last Month*, KQED (Dec. 5, 2023), https://www.kqed.org/news/11968786/recent-fires-at-marathons-martinez-refinery-spark-major-safety-concerns.

[129] RDEIA at 53.

[130] Marathon Martinez EIR, Appendix AQ/GHG: Air Quality and Greenhouse Gas Technical Analysis (July 2021) at pdf page 77, 78, 85 (Marathon Martinez EIR found air impacts of transportation significant because of cumulative emissions).

differ from and first 15-day change in ways that could affect emissions and their health impacts.[131] For example, the Proposed Amendments extend crediting periods for certain biomethane pathways for many years beyond the time period contemplated in the first 15-day change. It also grants large dairies avoided methane credits even if a future regulation prevents methane venting – a glaring departure from life-cycle accounting methodologies that CARB purports to use as the basis for determining the CI scores of fuels that participate in the program. Crediting of large dairy operations has a wide range of air quality and health impacts.[132] It follows that the Project's extension of the timelines for these credits will increase health impacts, rendering the SRIA's Health Impact Analysis and the RDEIA findings outdated and inadequate. The FEIA has not remedied these errors.

Additionally, the EIA relies on unrepresentative data to form its NOx and PM2.5 emissions estimates. The EIA bases its NOx and PM2.5 emission estimates for biofuels production used in its modeling on emission factors calculated from Kern Oil & Refining Co. Bakersfield refinery emissions.[133] This refinery, however, lacks co-located steam-methane reformation hydrogen production, meaning its emissions are not representative of those most similar to what the Proposed Amendments would incentivize. By contrast, Phillips 66 refinery in Rodeo represents a far larger share of RD in the LCFS, and its environmental review information suggests refinery NOx and PM2.5 emission factors roughly three to four times those that the EIA uses from Kern Oil & Refining Co. Bakersfield facility.[134] The FEIA does not correct this error. CARB's reliance on unrepresentative data to calculate emissions factors renders its analysis inadequate and makes it difficult for decision-makers and the public to understand the Proposed Amendments' impacts.

CARB's reliance on outdated and unrepresentative emissions data violates CEQA. Indeed, courts have invalidated CEQA documents that relied on outdated and incomplete scientific information. *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners* (2001) 91 Cal.App.4th 1344, 1380 (EIR using "scientifically outdated information" was not a reasoned, good-faith effort to inform decision-makers and the public); *Citizens to Preserve the Ojai v. County of Ventura* (1985) 176 Cal.App.3d 421, 430-32 (EIR violated CEQA by omitting any analysis of major source of cumulative air pollution).

C. CARB Fails to Analyze Impacts on Refinery Adjacent Communities.

CARB fails to analyze impacts of the Proposed Amendments on refinery adjacent communities likely to experience increased pollution as a result of the Proposed Amendments.

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[131] Earthjustice September 30, 2024 Comments at 29.
[132] *See* LCJA, Comments on the Proposed Amendments to the Low Carbon Fuel Standard (Feb. 20, 2024) at 2–5, www.arb.ca.gov/lists/com-attach/app-zip/6969-lcfs2024-Am5RNFA3WXkGX1Az.zip.
[133] *See, e.g.,* Community for a Better Environment, Comments on the Proposed 2024 Low Carbon Fuel Standard Regulation (Feb. 20, 2024) at 11.
[134] Rodeo Renewed Project, Draft Environmental Impact Report State Clearinghouse No. 2020120330 (Oct. 2021), *available at* https://www.contracosta.ca.gov/DocumentCenter/View/72880/Rodeo-Renewed-Project-DEIR-October-2021-PDF; Draft Revised Environmental Impact Report State Clearinghouse No. 2020120330 (Oct. 2023), *available at* https://www.contracosta.ca.gov/DocumentCenter/View/80824/Phillips-66-Rodeo-Renewed-Project-Draft-Revised-EIR-October-24-2023. All CEQA documents for Phillips 66 Rodeo Project available at https://www.contracosta.ca.gov/7945/Phillips-66-Rodeo-Renewed-Project.

In the RDEIA, CARB concludes that after mitigation, "air quality impacts resulting from the operation of new or modified facilities associated with the Proposed Amendments would remain significant and unavoidable."[135] This conclusion is not altered in the FEIA. These significant impacts are a result of increased biofuel production and transport as well as steam-methane reformation to supply biofuel refineries with necessary hydrogen.[136] Indeed, CARB "[s]taff expects proposed amendments will increase the production of low-carbon fuels in California, which will result in increased emissions at the production facilities."[137] According to the EIA "potential local increases in emissions would be largely dependent on the extent and location of increased biofuel production."[138] However, the EIA does not identify refineries or hydrogen production facilities in California that are beginning new or expanding existing production, evaluate potential emissions from these facilities, or assess the impact of these emissions on frontline communities. Instead, CARB downplays potential localized increases and asserts that "the extent of increased biofuel production and the location of potential new biofuel facilities cannot be known at this time and would be too speculative to quantify."[139] This is both factually inaccurate and legally insufficient under CEQA.

The locations of already existing or already approved biofuel refineries, as well as refineries capable of immediate conversion to biofuel production are identifiable. For example, Phillips 66 Rodeo, Marathon Martinez, and AltAir Paramount are three approved refinery biofuel conversions located in communities with some of the worst air pollution in the state.[140] The cities of Rodeo, Martinez, and Paramount contain environmental justice communities where residents are disproportionately burdened by pollution and vulnerable to health risks.[141] As CalEnviroScreen data demonstrates, census tracts nearest the Marathon refinery experience a pollution burden in the 82-91 percentile of state census tracts.[142] Residents in the census tract

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[135] RDEIA at 55.
[136] SRIA at B-2; RDEIA at 53.
[137] SRIA at B-2.
[138] RDEIA at 54.
[139] RDEIA at 54.
[140] Phillips 66 Rodeo and Marathon Martinez have nameplate capacities of 680 and 480 million gallons per year, respectively, making them two of the largest renewable diesel producers in the state. Gerveni et al., *Overview of the Production Capacity of U.S. Renewable Diesel Plants for 2023 and Beyond*, FARMDOCDAILY (Mar. 29, 2023), https://farmdocdaily.illinois.edu/2023/03/overview-of-the-production-capacity-of-u-s-renewable-diesel-plants-for-2023-and-beyond.html.
[141] *See* CBE RDEIA Comments at 7. Both the Rodeo and Martinez refinery communities are designated as "disadvantaged communities" by the California Environmental Protection Agency under SB 535. *SB 535 Disadvantaged Communities*, CAL. OFF. ENV'T HEALTH HAZARD ASSESSMENT, https://oehha.ca.gov/calenviroscreen/sb535 (last visited Nov. 7, 2024) (see "Disadvantaged Communities Map" and search for census tracts 6013358000, 6013320001, 6013320004, and 6013315000). The City of Paramount in Los Angeles County is also an environmental justice community, where residents are exposed to a range of industrial pollutants.
Verified Petition for Writ of Mandate and Complaint for Declaratory and Injunctive Relief at 11, *Communities for a Better Environment v. City of Paramount*, Los Angeles County Central District Superior Court, available at https://climatecasechart.com/wp-content/uploads/case-documents/2022/20220516_docket-na_petition-for-writ-of-mandate.pdf.
[142] CalEnviroScreen 4.0, CAL. OFF. ENV'T HEALTH HAZARD ASSESSMENT, https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/page/CalEnviroScreen-4_0/?org=OEH (Marathon Martinez: search for census tracts 6013320001 and 6013315000).

closest to the Phillips 66 refinery experience a pollution burden greater than 86 percent of census tracts in the state.[143] Similarly, residents in the census tracts in and around the AltAir Paramount refinery experience a pollution burden in the 89-98 percentile.[144] As a result, these refinery communities experience increased rates of asthma, cardiovascular disease, and other health burdens.[145]

Exhibit 1 contextualizes the locations of these biofuel refineries alongside the baseline air pollution for communities adjacent to these facilities, demonstrating the feasibility of identifying and analyzing air quality impacts of increased biofuel production.

CARB should, and could, connect this data and assess the impact of increasing biofuel production on these communities. Other public agencies have conducted similar analyses because current LCFS biofuel refining incentives have already resulted in rapid increases in biofuel production. [146] For example, the Environmental Impact Report ("EIR") for the AltAir Paramount refinery analyzed foreseeable air quality impacts from expanding biofuel production at the refinery. The EIR for the expansion project estimated that the expanded refinery would release 1,743 pounds of VOCs and 2,133 pounds of NOx emissions per day, and it would require 50 rail car unloads per day and 540 diesel truck trips.[147] CARB could have done a similar analysis here to disclose reasonably foreseeable impacts from increased production of biofuels at these refineries. Even if CARB cannot determine the exact location of all future biofuels refineries it could provide a range of estimated emissions based on reasonable assumptions grounded in existing data on refinery conversion and expansion potentials. CARB's failure to analyze these impacts runs afoul of CEQA's "purpose [] to alert the public and its responsible officials to environmental changes before they have reached [] points of no return." *Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 392.

Additionally, Exhibit 1 aggregates data from the U.S. Energy Information Administration identifying all refineries in California with the key equipment necessary to be converted with relatively minor retooling into a biofuel refinery.[148] Again, CARB could have easily identified these facilities and analyzed a range of potential impacts of biofuel production on air quality in surrounding communities.

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[143] CalEnviroScreen 4.0, CAL. OFF. ENV'T HEALTH HAZARD ASSESSMENT, https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/page/CalEnviroScreen-4_0/?org=OEH (Phillips 66 Rodeo: search for census tract 6013358000).

[144] CalEnviroScreen 4.0, CAL. OFF. ENV'T HEALTH HAZARD ASSESSMENT, https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/page/CalEnviroScreen-4_0/?org=OEH (AltAir Paramount: search for census tracts 6037553601, 6037553601, and 6037553502.)

[145] *See* CalEnviroScreen data charts.

[146] Martin, *A Cap on Vegetable Oil-Based Fuels Will Stabilize and Strengthen California's Low Carbon Fuel Standard*, THE EQUATION (Jan. 30, 2024), https://blog.ucsusa.org/jeremy-martin/a-cap-on-vegetable-oil-based-fuels-will-stabilize-and-strengthen-californias-low-carbon-fuel-standard/.

[147] CBE RDEIA Comments at 7; Verified Petition for Writ of Mandate and Complaint for Declaratory and Injunctive Relief at 11, *Communities for a Better Environment v. City of Paramount*, Los Angeles County Central District Superior Court, available at https://climatecasechart.com/wp-content/uploads/case-documents/2022/20220516_docket-na_petition-for-writ-of-mandate.pdf.

[148] Refinery capacities by individual refinery were determined based on the US Energy Information Administration: Washington, D.C. Annually updated online spreadsheet available at https://www.eia.gov/petroleum/refinerycapacity/.

CARB's acknowledgement that the Proposed Amendments will further incentivize biofuel production which will result in significant and unavoidable air quality impacts[149] is insufficient without an accompanying analysis that apprises the public of the severity and magnitude of these potential impacts. This sort of analysis is not only appropriate but required, even for a programmatic environmental review such as this one. *See Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 17 Cal.App.5th 413, 440.

The *Cleveland National Forest Foundation* court found that the adequacy of an agency's discussion of environmental impacts is an issue distinct from the extent to which the agency is correct in its determination whether the impacts are significant. The "designation of a particular adverse environmental effect as 'significant' does not excuse the [agency's] failure to reasonably describe the nature and magnitude of the adverse effect." *Id.*; *see also Berkeley Keep Jets,* 91 Cal.App.4th at 1371 (the EIR's approach of simply labeling the effect "significant" without accompanying analysis of the project's impact on community health was found inadequate under CEQA). The court in *Cleveland National Forest Foundation* invalidated a Programmatic EIR where the agency failed to identify sensitive receptors based on available information. *Cleveland National Forest Foundation* 17 Cal.App.5th at 440. The fact that "more precise information may be available during the next tier of review did not excuse [the agency] from providing the information it could reasonably provide now." *Id.* The California Supreme Court also held that CEQA obligates agencies to collect the necessary information to identify significant environmental impacts and propose feasible mitigation measures—even at a programmatic level; without the required information, meaningful assessment of a plan or program's impacts under CEQA are impossible. *Sierra Club v. Board of Forestry* (1994) 7 Cal.4th 1215, 1236-1237 (invalidated logging plan because of failure to analyze impact to sensitive species).

Here, it is insufficient for CARB to simply conclude, without analysis, that long-term air quality impacts of the Proposed Amendments will be significant and unavoidable. CARB should have, and could have, analyzed the foreseeable air quality impacts from new or expanding biofuel production at existing biofuel refineries and refineries easily capable of conversion. CARB's failure to disclose localized impacts and analyze the public health and air quality implications of the Proposed Amendments leaves the public and decisionmakers in the dark about the Project's pollution burdens and public health impacts to frontline communities. The programmatic nature of this environmental review does not excuse CARB's failure to disclose and assess the magnitude and severity of air quality impacts from the Proposed Amendments' impacts on biofuel production at already existing biofuel refineries. Failing to provide this analysis violates CEQA.

Critically, CARB has already committed to examining the localized impacts of biofuels refining in the LCFS. In the CEQA Functional Equivalent Document for the 2008 Scoping Plan, CARB stated that "[t]he LCFS regulatory proposal will contain a more detailed analysis of the potential air quality impacts. Such impacts include the evaluation of the lifecycle greenhouse gas emissions and environmental impacts, potential air quality impacts associated with the production, transportation and use of the fuels, and an assessment of the potential localized and

[149] RDEIA at 55.

cumulative air quality impacts of building in-state production facilities."[150] CARB has underscored this obligation in its representations in court. The 2008 Scoping Plan was the subject of litigation in which petitioners challenging the FED for the plan pointed to its failure to examine and disclose localized impacts from expanded biofuel refining, among other violations. In its response brief, CARB stated that "Petitioners could have, but did not, challenge the environmental review conducted by ARB of the LCFS directly. That is the appropriate venue for petitioners to raise this complaint" – i.e. Petitioners' complaint that CARB failed to analyze in the FED the localized and cumulative air quality effects of the expansion of future facilities' biofuel production.[151] Thus, CARB has already admitted that it is able and obligated to examine localized impacts in the LCFS rulemaking process.

Finally, while CARB acknowledges—though fails to analyze—foreseeable localized increases in air pollution, the agency asserts that those impacts will be partially offset by end use of biodiesel, renewable diesel, and alternative jet fuel use which would maintain air pollution levels regionally.[152]

In its Response to Comments, CARB states that "the Proposed Amendments have the potential to introduce localized pollution to communities within the proximity of biofuel production facilities and routes for biofuel feedstock and finished fuel transportation. However, CARB staff does not believe significant localized increases would be likely and anticipate overall beneficial long-term operational impacts statewide."[153] CARB does not offer any evidence or analysis to support these conclusions. Since CARB has not analyzed localized impacts, it has no basis for concluding that it "does not believe significant localized increases would be likely."[154]

And even if there were an offsetting effect, potential regional or statewide benefits from end-use of biofuels (which are themselves questionable given NOx concerns and double counting, as we explain above) does not excuse CARB's failure to analyze and mitigate worsening air quality and public health risks for refinery communities. Statewide improvements are not adequate mitigation for localized impacts.

V. CARB Fails to Cure Defects in Its Treatment of Electrolytic Hydrogen.

In our comments on the RDEIA, we explained how use of electrolytic hydrogen could increase GHGs if proper safeguards are not in place. As one recent analysis finds, "[e]lectrolytic hydrogen that relies on fossil fuel power would fail to reduce net climate pollution across all end uses," with the exception of steel production.[155] It warns that "[h]ydrogen would almost universally do more harm than good if its production isn't subject to strict guardrails (i.e., requiring electrolyzers to draw from new, deliverable, hourly matched clean energy) that prevent

[150] Climate Change Scoping Plan Appendices, Volume III: CEQA (Dec. 2008) at J-27 https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume3.pdf (emphasis added).
[151] CARB, Respondents' Brief - AIR et al. vs. CARB CPF-09-509562 (July 12, 2010) (emphasis added).
[152] RDEIA at 53.
[153] Response to Comments at 19.
[154] *Id*.
[155] Esposito, Hydrogen Policy's Narrow Path: Delusions And Solutions (Aug. 26, 2024) at 5, https://energyinnovation.org/publication/hydrogen-policys-narrow-path-delusions-and-solutions/.

it from increasing fossil fuel power plant electricity generation—even after accounting for its use downstream."[156] CARB fails to address this problem and analyze the emissions impacts of the Project's reliance on electrolytic hydrogen that is not subject to hourly matching requirements and other necessary guardrails. CARB also does not analyze the energy impacts associated with increased demand for electricity and associated strain on the electric grid. We highlighted these failures in our prior comments, and CARB has failed to address them. These omissions violate CEQA; they undermine the role of the RDEIA as an informational document and lead to insufficient mitigation of adverse Project effects.

VI. CARB Fails to Analyze and Disclose Impacts from the Production of Hydrogen Derived from Fossil Methane.

A. CARB Fails to Analyze the Effects of Delaying the Phase Out of Credit Generation for Fossil Methane-Derived Hydrogen from 2030 to 2035.

In the Second 15-Day change, CARB allows the fossil fuel-derived hydrogen that is not paired with biomethane credits to remain in the program until 2035.[157] This is a significant change from the 2030 phase out date in the First 15-Day Change.

The production of fossil-fuel derived hydrogen via steam-methane reformation emits GHGs and a wide range of air pollutants that are harmful to human health, as described above and in prior comments. In the FEIA, CARB fails to disclose, analyze, and mitigate the effects of the 2035 phase out date on both greenhouse gas emissions and air pollution. Its most updated air quality and GHG modeling is from the first 15-day change, which assumes a 2030 phase out.

CARB also fails to analyze and disclose the extent to which the continued allowance of fossil fuel-derived hydrogen in the program is consistent with the State's carbon neutrality mandates, as articulated in Assembly Bill ("AB") 1279[158] and applicable air quality standards. For these reasons, the EIA violates CEQA.

B. CARB Fails to Cure Defects in the EIA's Analysis of the Effects of Fossil-Fuel Derived Hydrogen Paired with Biomethane Attributes.

As we asserted in prior comments, CARB's failure to analyze the GHG emissions and other impacts of fossil hydrogen paired with book-and-claim biomethane credits violates CEQA. In its FEIA, CARB fails to remedy this violation. Evidence shows that the GHG benefits of book-and-claim biomethane credits derived from dairies and other sources of biomethane are largely illusory and that the negative CI scores assigned to livestock methane projects risk rewarding and expanding polluting management practices.

Two new reports reinforce this showing.[159] In one study of Iowa dairy farms, evidence suggests that the LCFS's biomethane incentives may lead to herd size increases and other

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[156] *Id*.
[157] https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf.
[158] AB 1279 (Muratsuchi, 2022).
[159] Jordan, 'More manure means more energy': Iowa dairies with biogas digesters are growing their herds, which concerns water quality advocates: Review shows 23% boost in animal units (Nov. 3, 2024), https://www.thegazette.com/agriculture/more-manure-means-more-energy-iowa-dairies-with-biogas-digesters-are-growing-their-herds-which-c/.

environmentally damaging outcomes. The analysis found that since 2021—when Iowa permitted 15 new digester facilities and the Legislature passed a law allowing animal feeding operations with digesters to exceed the state's limit of 8,500 animal units—almost half of the 15 farms added to their herd. Taken together, the total number of cows went from 84,861 before the sites got their digester permits to 104,424 after—a 23 percent increase.[160] As Leadership Counsel for Justice and Accountability ("LCJA") detailed in their prior comments, this increase in herd size can cause higher methane emissions than would have otherwise occurred as well as other localized water and air pollution impacts. For instance, according to the report, digester releases of manure have also caused discharges of pollution to the detriment of local waterways.[161]

A second recent report, published since the closure of the comment period on the RDEIA, underscores these risks.[162] "When credit prices have been high, the combination of incentives from the LCFS program and several related state and federal programs have been sufficient to potentially encourage larger herd sizes, specifically to produce additional methane emissions to capture for profit… a perverse incentive that has been documented in other carbon offsetting programs."[163] CARB does not address this evidence or account for these effects from its treatment of so-called "renewable hydrogen."

C. CARB Fails to Analyze and Disclose Cumulative Effects of Expanded Biofuels and Fossil Fuel-Derived Hydrogen Production on Impacted Communities.

An EIA must "discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." Guidelines § 15130(a). Here, the EIA fails to examine the extent to which the Project's increase of biofuels and hydrogen production will cumulatively impact communities near refineries where production of both fuels is reasonably foreseeable to occur. As detailed above, the production of biofuels and of hydrogen emit a wide range of pollutants. They are also produced in communities that are already bearing substantial pollution burdens, as illustrated in Exhibit 1. As CARB admits, the Project will lead to expansion of the production of both fuels and therefore increased localized impacts in production areas. CARB was therefore obligated to examine the cumulative effects of the Project. Its failure to do so violates CEQA. See *Citizens to Preserve the Ojai v. County of Ventura* (1985) 176 Cal.App.3d 421, 430-32 (EIR violated CEQA by omitting any analysis of major source of cumulative air pollution).

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[160] *Id.*

[161] *Id.*; *see also* Iowa Department of Natural Resources, Administrative Consent Order 2022 AFO- \18, https://programs.iowadnr.gov/legal/documents/637933066169476294 2022AFO18.pdf?_gl=1*kje968*_gcl_au*MTU3NjQ0MDk1NS4xNzI4OTE4MjM4 (detailing discharge from digester into local waterway.).

[162] Cullenward, California's Low Carbon Fuel Standard (Oct. 7, 2024), https://kleinmanenergy.upenn.edu/research/publications/californias-low-carbon-fuel-standard/.

[163] *Id.* at 13.

VII. CARB Continues to Fail to Address and Mitigate the Impacts of Reliance on Direct Air Capture and to Adopt All Feasible Mitigation.

In addition to the deficiencies enumerated in our September 30, 2024 comments with respect to DAC, CARB failed to analyze and disclose the energy impacts of the Proposed Amendments' reliance on DAC. The CEQA Guidelines recognize that wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources, may result in a significant environmental impact.[164] "If analysis of the project's energy use reveals that the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources, [an] EIR shall mitigate that energy use."[165] Such impacts to energy use, utilities and service systems must be evaluated under CEQA.[166]

Here, the EIA does not meet the basic requirements for evaluating and mitigating energy use because it brushes aside possible significant energy-use-related environmental effects. As detailed in our September 30, 2024 comments, CARB's analysis shows that reliance on DAC will be substantial, but CARB fails to acknowledge these effects. For instance, CARB fails to examine the energy use of DAC including the strain that DAC reliance would put on the electric grid. CARB does not analyze the extent to which the reliance on energy-intensive DAC could amount to unnecessary consumption of energy resources because, as explained in our September 30 comments, it would function as an offset to fossil fuel use rather than a technology to mitigate residual or legacy emissions, as contemplated by the Scoping Plan.

CARB also fails to address the risk that new energy demand to power DAC risks competing with and adversely impacting critical transportation electrification efforts in California. CARB's rules require widespread deployment of ZEVs, which will increase demand for electricity to power the transportation sector. CARB fails to address the fact that the Project's DAC reliance could hamper necessary transportation electrification, thereby undermining attainment of state ZEV goals and reducing the many climate and air quality benefits of zero-emission transportation technology.

CARB acknowledges that DAC will increase electric load but fails analyze the associated environmental effects.[167] Further, the DEIA states that "[o]n-site energy generation and storage to power the capture equipment are key mitigation strategies involving photovoltaic electricity generation, battery storage, and microgrid systems. Increased electricity demand would be met by increased generation, both on-site and off-site."[168] As we noted in our September 30 comments, CARB provides no justification for making such an assumption. The Proposed Amendments do not require DAC projects to be powered exclusively by off-grid renewables and

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[164] 14 Cal. Code Regs § 15126.2(b).
[165] *Id.*
[166] *See* Public Resources Code section 21100(b); CEQA Guidelines §§ 15126.2(b), Appendix F: Energy Conservation. Guidelines; Appendix G, Environmental Checklist Form, § XIX.
[167] See ISOR, Appendix E of https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appe.pdf ("the process of capturing CO 2 directly from the atmosphere has higher electricity demand, which makes it financially challenging and may drive the need for additional electricity load.").
[168] DEIA at 31.

there is therefore no sound basis for assuming such power mix in the analysis. Without such a requirement, there is no basis for finding that DAC projects' impacts would in fact be mitigated.

Courts have found mitigation measures insufficient under CEQA when they failed to require actual mitigative action, and instead required reports or fee arrangements. *See Cal. Clean Energy Comm. v. City of Woodland* (2014) 225 Cal. App. 4th 173, 197 (finding that fair share fee mitigation measures that "do not require the City to undertake any *action* . . . stand in contrast to the 'CEQA require[ment] that feasible mitigation measures actually be implemented as a condition of development . . .'"); *id.* at 199 (finding a mitigation measure inadequate because it "requires the City to take no action other than to coordinate . . . to prepare a plan . . . [and] does not require any action by the City to mitigate the [impacts] it may discover to result [from the Project]."). Here, there is not even a requirement to plan, study, or report on adoption of the referenced on-site solar energy generation, much less any requirement that it actually be installed. This baseless assumption is insufficient under CEQA. *See King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal. App. 5th 814, 877–88 (finding that a mitigation measure relying on the purchase of credits "from an established agricultural farmland mitigation bank" or "equivalent program" was inadequate given that the record did not establish such banks or programs even existed or "were available."). In making such an unsupported assumption about the source of power generation for future DAC use, CARB is masking a potentially significant effect of the Project and failing to mitigate its adverse impacts on the environment.

VIII. CARB Fails to Analyze and Mitigate the Effects of Massive Reductions in Support for Electrification of Medium and Heavy Duty Vehicles.

CARB's second 15-day change includes major rollbacks to investments in electrification of medium and heavy duty vehicles ("MHDV") when compared to staff's original Proposal in the ISOR. CARB does not disclose or analyze the effects of these changes. Based on an independent analysis undertaken by ICCT, the changes amount to a loss of annual revenue ranging from $176 and $1,261 million from 2025-2035 under the current proposal; enough to subsidize the cost gap of nearly 100,000 Class 8 sleeper cabs between 2025 and 2035."[169] The effect of lower number of ZEVs will be increased diesel emissions, which include toxic and carcinogenic diesel particulate matter as well as NOx and other pollutants. These adverse impacts will be felt most acutely in already overburdened communities near major transportation corridors. Moreover, the analysis fails to disclose how this shift impacts attainment efforts for a range of pollutants, including the 1-hour ozone standard, the 8-hour ozone standard, and the fine particulate matter standards. CARB fails to address these effects, and this failure violates CEQA.

IX. CARB Continues to Fail to Analyze a Reasonable Range of Alternatives.

As we noted in prior comments, there are fundamental flaws in CARB's analysis of alternatives to the Proposed Amendments. The alternatives chosen do not contribute to "a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation"[170] because they fail to consider a ZEV-focused alternative that limits combustion fuels even though such an alternative would "feasibly attain most of the basic

[169] O'Malley et al., Closing the heavy-duty charging infrastructure crediting cost gap (Oct. 28, 2024).
[170] CEQA Guidelines § 15126.6(a).

objectives of the project but would avoid or substantially lessen any of the significant effects of the project"[171] including air quality impacts. *See Save Our Capitol! v. Dep't of Gen. Servs.* (2023) 87 Cal. App. 5th 655.

In assessing whether a Project's alternatives analysis is deficient, "[e]xamining alternatives begins with project objectives because it is these objectives that a proposed alternative must be designed to meet." *Golden Door Properties, LLC v. County of San Diego* (2020) 50 Cal. App. 467, 546. Here, the RDEIA identifies "reduc[ing] the CI of fuels used in California's transportation sector" as the objective of the current LCFS regulation,[172] and identifies several objectives of the Proposed Amendments, including improving California's "long-term ability" to support the "use of increasingly lower-CI transportation fuels and to improve the program's overall effectiveness," as well as "support[ing] the transition of biomethane fuel pathways for combustion out of transportation" and incentivizing ZEV fueling infrastructure buildout.[173] By failing to analyze a ZEV-focused alternative scenario, the EIA ignores "an alternative that would feasibly attain" most Project objectives "while also lessening the project's significant impacts," and thus violates CEQA. *See Save Our Capitol!*, 87 Cal App. 5th at 703.

As commenters have explained throughout this rulemaking process, a ZEV-focused alternative could be achieved through a combination of measures including effective restrictions on crop-based biofuels, such as a cap on volumes, which the alternatives analysis does not evaluate.[174] Rather than design and analyze an alternative that would limit the oversupply of credits for combustion fuels to the benefit of zero-emissions alternatives, CARB constructs and rejects Alternative 2. According to CARB, Alternative 2 is a "version" of the "Comprehensive EJ Scenario" that was analyzed and rejected in the ISOR.[175] For numerous reasons, CARB's inclusion of Alternative 2 does not satisfy CEQA.

First, Alternative 2 does not include restrictions on biofuel volumes. Commenters have proposed such a limit since the initiation of this rulemaking.[176] Further, modeling of an alternative regulatory design by Stanford researchers found that capping lipid biofuels, among other measures, would unleash an infusion of dollars from the LCFS to transportation electrification pathways, [177] thereby propelling deployment of electric cars and trucks beyond current levels. Such growth in zero-emissions transportation could provide substantial climate and air quality benefits when compared to the Proposed Amendments. A volume limit on

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[171] *Id.*
[172] RDEIA at 4.
[173] *Id.* at 8–9.
[174] *See, e.g.*, ICCT comments on the ISOR (Feb. 20, 2024) at (proposing an alternative that "[s]et[s] a cap on the volume of lipid-derived fuels credited under the LCFS program", among other alterations from the Proposed Alternative.). 20, 2024) (proposing an alternative that "[s]et[s] a cap on the volume of lipid-derived fuels credited under the LCFS program", among other alterations from the Proposed Alternative.).
[175] DEIA at 175.
[176] O'Malley et al., Setting a lipids fuel cap under the California Low Carbon Fuel Standard (Aug. 2022)
[177] Wara et al., Simulating an "EJ Scenario" for the Low Carbon Fuel Standard Rule Update using the ARB CATS Model (May 31, 2023), https://ww2.arb.ca.gov/sites/default/files/2023-05/Stanford%20Presentation.pdf.

biofuels would also reduce climate, global hunger, and biodiversity harms, as well as localized harms in frontline refinery communities, as detailed above and in our prior comments.

Second, CARB creates a methane "cliff" in Alternative 2, abruptly ending all avoided methane crediting in 2025 even though groups that proposed credit restrictions suggested a phase out over time. An analysis of the EJ Scenario by Stanford University researchers explains why such an immediate end to all avoided methane crediting was misguided and led CARB to reach skewed conclusions about the EJ Scenario's effects.[178] The modeling of the Stanford experts "shows that a scenario consistent with many of the asks from the environmental justice community, can be constructed using CARB's modeling tools and consistent with many of CARB's stated objectives both from the Scoping Plan Update and as stated in the current LCFS amendment process."[179]

Third, CARB did not eliminate DAC credits as the EJ Scenario proposed. As we explained in our RDEIA comments, CARB claims in the DEIA that the exclusion of DAC in Alternative 2 would make it challenging to achieve the proposed 90% CI reduction by 2045, stating: "compliance with the regulation is difficult without direct air capture, so this scenario risks creating demand for credits that exceeds available supply beyond 2030."[180] Yet this assertion is not adequately supported by the modeling provided.

Fourth, CARB's modeling does not allow for ZEVs to increase. Consequently, there is no way for the public to know what an alternative focused on ZEV support rather than combustion fuels would yield in terms of improved air quality and associated health benefits. CARB could have read ZEV numbers into the model to see what higher levels looked like, even if they could not do an optimization under CATS. CARB did not do this, and as a result, it did not accurately model what the proposed EJ alternative would yield in terms of air quality, health, and equity benefits**.**

Fifth, CARB did not consider adjustments to the Proposed Amendments' CI benchmark that, when combined with restrictions on oversupply of biofuels and biomethane credits, could have served to meet the Project's objective of increasing the credit price while also reducing harms and distortions caused by these fuels and minimizing the pass-through costs.

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[178] Wara et al., Comments of Wara et al. Regarding Proposed Amendments to the Low Carbon Fuel Standard (May 10, 2024) at 7-8. ("It is our understanding that the EJAC proposed the immediate elimination of future pathway approvals for dairy methane at current carbon intensity (CI) scores.6 Such an approach would allow already-approved pathways to maintain their LCFS approval for the entirety of their 10-year duration. With this timeline, most current contracts would sunset by 2032. This approach contemplates not a "cliff" but a more gradual transition of dairy methane crediting to higher CI values, honoring CARB commitments to existing LCFS pathways while also increasing the carbon intensity (CI) of dairy methane by 2032."). Wara et al. then "illustrate a more gradual transition to a higher dairy methane CI," by assuming "that the Board decides to stop approval of future pathways with the CI scores in Table 3, and instead adopts a higher CI for dairy methane projects more in line with methane produced from sewage treatment plants (which are assumed flare methane to carbon dioxide rather than simply venting methane to the atmosphere). This gradually increases the average CI score of dairy methane so that it reaches a positive value of ~44 gCO2e/MJ by 2032."

[179] *Id*. at 8.

[180] DEIA at 175.

CARB could have explored alternatives that included some or all of these adjustments. Indeed, the "illustrative scenario," modeled by Stanford researchers allowed for "reasonably similar credit prices to those proposed by CARB staff," and achieved "similar emission reduction objectives in the liquid fuels sector, and it does not rely on burning more fossil fuels in order to limit RD or livestock dairy book-and-claim crediting." [181] According to their analysis, the illustrative scenario achieved this "by relying on modest changes to assumptions about the mix of ZEV and emitting vehicles on the road that we believe more realistically depict what has and is actually happening in California since the Scoping Plan modeling was conducted."[182] Although this illustrative scenario was presented to CARB in May of 2024, CARB failed to analyze it in the FEIA.

In sum, the numerous errors in CARB's analysis led CARB to explore an inadequate range of alternatives and to improperly conclude that measures proposed by commenters and in the EJ Scenario are infeasible and will not meet the Project's objectives. CARB thus failed to provide critical information about how the Proposed Amendments could be modified to achieve most of the Project's objectives while avoiding environmental harms. These failures violate CEQA. See *Save Our Capitol!*, 87 Cal. App. 5th at 703.

X. A Revised EIA Must Be Recirculated for Public Review and Comment.

Because of the inadequacies discussed above, the environmental review conducted thus far cannot form the basis of a final EIA. As explained in our prior comments, CEQA requires lead agencies to prepare and recirculate a supplemental draft "[w]hen significant new information is added to an environmental impact report" after public review and comment on the earlier draft. Pub. Res. Code § 21092.1. The opportunity for meaningful public review of significant new information is essential "to test, assess, and evaluate the data and make an informed judgment as to the validity of the conclusions to be drawn therefrom." *Sutter Sensible Planning, Inc. v. Sutter County Board of Supervisors* (1981) 122 Cal.App.3d 813, 822; *see also City of San Jose v. Great Oaks Water Co*. (1987) 192 Cal.App.3d 1005, 1017. An agency cannot simply release a draft report "that hedges on important environmental issues while deferring a more detailed analysis to the final [EIR] that is insulated from public review." *Mountain Lion Coalition v. California Fish and Game Comm'n* (1989) 214 Cal.App.3d 043, 1052.

To cure the flaws in the RDEIA identified in this letter, CARB must obtain substantial new information. This information is necessary to adequately assess the proposed Project's environmental impacts, and to identify effective mitigation and alternatives capable of alleviating the Project's significant impacts. This new information will clearly necessitate recirculation. CEQA requires that the public be given a meaningful opportunity to review and comment upon this significant new information in the form of a second recirculated draft EIA.

[181] Wara et al. at 8.
[182] *Id.* at 8.

Conclusion

For all of the reasons described above, the EIA fails to comply with the requirements of CEQA. We respectfully request that CARB correct these errors and recirculate a revised draft EIA for public review and comment.

Sincerely,
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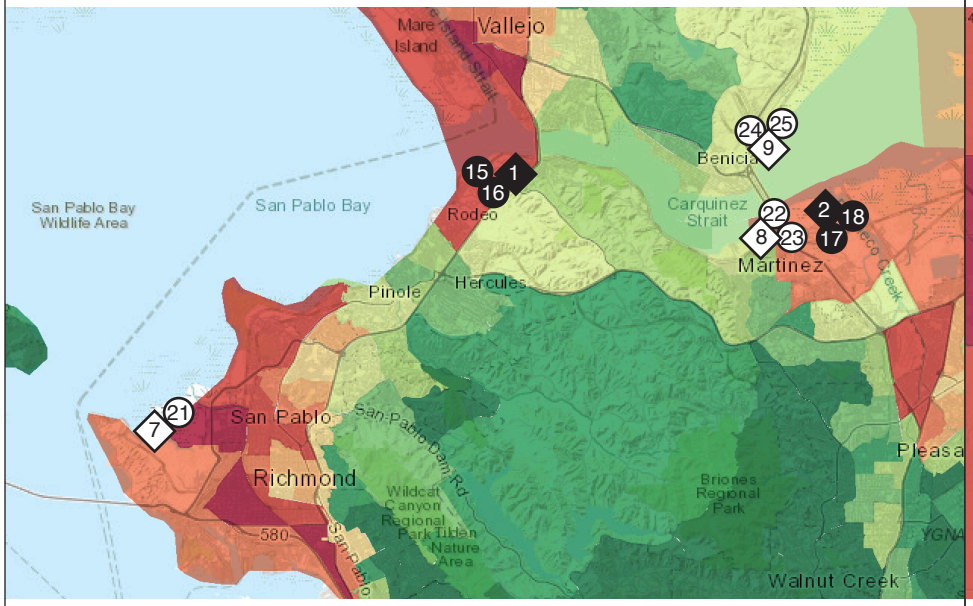
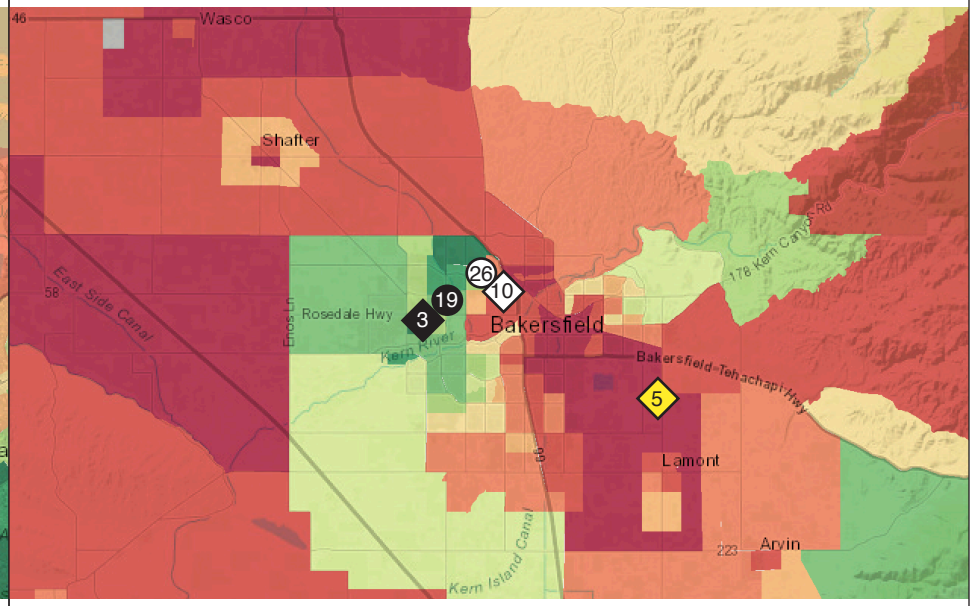
Exhibit 1

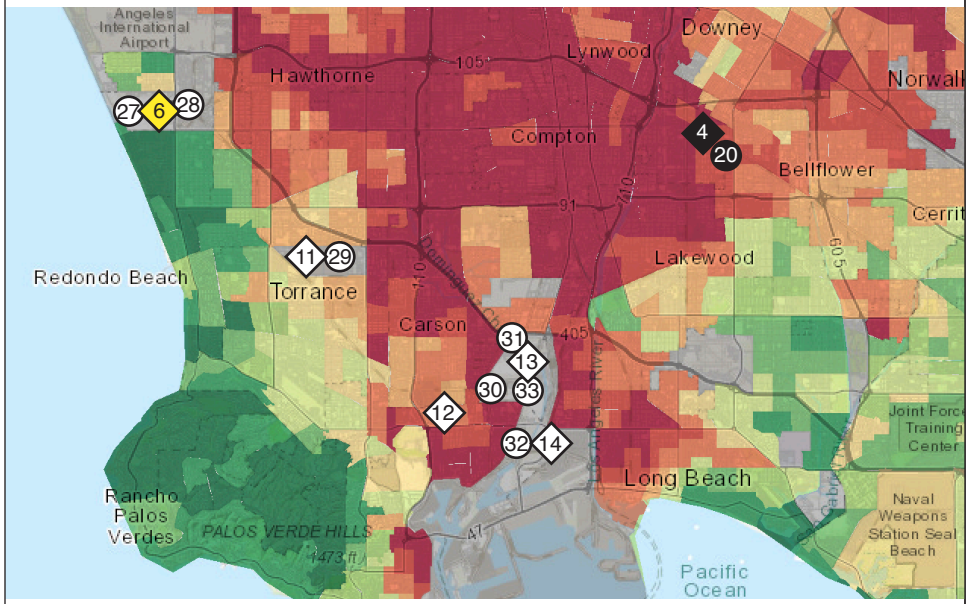
A. Northeastern San Francisco Bay Area



B. Bakersfield Area



C. Southern Los Angeles County



Maps 1. Communities near co-located refining and hydrogen steam methane reforming (SMR) plants face disparately high cumulative environmental impacts.

Co-located Infrastructure Key

- **Fully converted biofuel refineries**
- **Oil refinery partially processing biofuels**
- **Oil refinery available to process biofuels**
- **SMR plant fully dedicated to hydrogen production for biofuel refining**
- **Other SMR plant (co-located with refinery)**

HEFA: Hydrotreated esters and fatty acids; an oil refining technology that makes biofuels using hydrogen. Enviroscreen data maps from Calif. Office of Environmental Health Hazard Assessment. See next page for refinery and hydrogen plant data and references.

Cumulative Impact Key

Overall Percentile

CalEnviroScreen 4.0 Results

- >90 - 100 (Highest Scores)
- >80 - 90
- >70 - 80
- >60 - 70
- >50 - 60
- >40 - 50
- >30 - 40
- >20 - 30
- >10 - 20
- 0 - 10 (Lowest Scores)

Maps, continued. Facility addresses and notes.

Oil Refinery Fully Converted to HEFA Biofuel Processing

1. Phillips 66 Co., Rodeo 1380 San Pablo Ave., Rodeo 94572
2. Marathon/Neste, Martinez 150 Solano Way, Martinez 94553
3. Bakersfield Renewable Fuels, Bakersfield 6451 Rosedale Hwy., Bakersfield 93308
4. AltAir, Paramount 14700-08 Downey Ave., Paramount 90723

Oil Refinery Partially Processing HEFA Biofuels ("co-processing")

5. Kern Oil & Refining, Bakersfield Hwy. 184 & E. Panama Ln. 93307
6. Chevron, El Segundo 324 W. El Segundo Blvd., El Segundo 90245

Oil Refinery Available to Process HEFA Biofuels

7. Chevron, Richmond 841 Chevron Way, Richmond 94802
8. PBF Energy Corp., Martinez 3485 Pacheco Blvd., Martinez 94553
9. Valero Energy Corp., Benicia 3400 E. 2nd Street, Benicia 94510
10. San Joaquin Refining, Bakersfield 3542 Shell Street, Bakersfield 93308
11. PBF Energy Corp., Torrance 3700 W. 190th Street, Torrance 90504
12. Phillips 66 Co., Wilmington and Carson (two lots) 1520 Sepulveda Blvd., 90745 and 1660 W. Anaheim Street, 90744
13. Marathon, Carson and Wilmington (two lots) 2350 E. 223rd Street 90810 and 23208 Alameda Street 90810
14. Valero / Ultramar, Wilmington 2402 E. Anaheim Street, Wilmington 90744

SMR Plant Dedicated to Hydrogen Production for HEFA Refining

15. Air Liquide, Rodeo (in Rodeo refinery), 1380 San Pablo Ave., Rodeo 94572
16. Phillips 66 Co., Rodeo* 1380 San Pablo Ave., Rodeo 94572
17. Air Products, Martinez (abuts Marathon) 150 Solano Way, Martinez 94553
18. Marathon/Neste, Martinez* 150 Solano Way, Martinez 94553
19. Bakersfield Renewable Fuels,* Bakersfield 6451 Rosedale Hwy., Bakersfield 93308
20. AltAir, Paramount* 14700-08 Downey Ave., Paramount 90723

Other Existing SMR Plant (co-located with refinery)

21. Chevron, Richmond* 841 Chevron Way, Richmond 94802
22. PBF Energy Corp., Martinez* plt. 1 3485 Pacheco Blvd., Martinez 94553
23. PBF Energy Corp., Martinez* plt. 2 3485 Pacheco Blvd., Martinez 94553
24. Valero Energy Corp., Benicia* 3400 E. 2nd Street, Benicia 94510
25. Linde Inc., (abutts Benicia refinery) 331 E.Channel Road, Benicia 94510
26. San Joaquin Refining, Bakersfield* 3542 Shell Street, Bakersfield 93308
27. Chevron, El Segundo* 324 W. El Segundo Blvd., El Segundo 90245
28. Air Liquide, El Segundo (at Chevron refinery) 324 W. El Segundo Blvd., 90245
29. Air Products, Torrance (at PBF refinery) 3700 W. 190th Street, Torrance 90504
30. Phillips 66 Co., Wilmington and Carson* (two lots) 1520 Sepulveda Blvd., 90745 and 1660 W. Anaheim Street, 90744
31. Air Products, Carson (abutts Marathon) 23300 S Alameda Street, Carson 90810
32. Air Products, Wilmington (near Valero/Ultramar) 700 N. Henry Ford Ave. 90744
33. Marathon, Carson and Wilmington* (two lots) 2350 E. 223rd Street 90810 and 23208 Alameda Street 90810

*At most of the refineries, SMR plants shown in the maps are owned and operated by the refiners themselves, in addition to any hydrogen supplied by SMR plants with other owners.

NOTES ON HEFA BIOFUEL REFINING

Four full conversions from petroleum crude to HEFA biofuel refining were completed, permitted or planned as of November 2024. Marathon and Neste completed phased-in commissioning of their 48,000 barrels per day HEFA refinery near Martinez in late 2023. Phillips 66 reported commissioning the full conversion of its Rodeo refinery to process 100 percent HEFA feeds at up to 67,000 b/d during early summer 2024. These commissions were reported in causal analyses for significant flaring at the plants, which were made public under BAAQMD Rule 12-12.

A full conversion from petroleum refining to a small HEFA biofuel refinery was completed years ago and was followed by a proposed capacity expansion to 25,000 b/d that is now permitted and underway at AltAir in Paramount. This includes a new refiner-owned SMR plant. Bakersfield Renewable Fuels reported that a full conversion to HEFA processing at the former Big West refinery site is in construction with planned start-up in late 2024.

Other refineries in California have begun HEFA co-processing (adding plant oils and animal fats to the feedstock in refineries that continue to refine petroleum crude as well). These include Kern Oil & Refining in Bakersfield, Chevron El Segundo, and, before its full refinery conversion discussed above, Phillips 66 Rodeo. See apps. B0079, B0394, B032502, B032301, and B024101 in CARB "Tier 2 Pathway" application reviews; https://ww2.arb.ca.gov/resources/documents/2023-lcfs-pathways-requiring-public-comments. Kern Oil refinery reportedly supplies all hydrogen for its co-processing from catalytic naphtha reforming. *Id.* This unique HEFA processing strategy reflects its low refinery complexity.

Further, HEFA co-processing by at least one crude oil refiner in California was not disclosed publicly until long after it had begun, and HEFA diesel demand is rising. This suggests other refiners may begin co-processing before it is publicly reported. The map shows all refineries in California that reported hydro-processing capacity capable of conversion to HEFA refining (hydrocracking, gas oil hydrotreating, distillate hydrotreating, or combinations of these hydro-processing units).

NOTES ON CUMULATIVE IMPACT MAPPING

Maps shown here were accessed from CalEnviroScreen 4.0 using the California Office of Environmental Health Hazard Assessment (OEHHA) mapping tools on 29 Oct. 2024 at https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40. OEHHA integrates and weights data for 21 environmental health indicators to measure and report cumulative environmental health impacts at the census tract level in its CalEnviroScreen mapping. All OEHHA indicators and weightings were included ("left on") in the mapping reproduced here.

CalEnviroScreen is a widely used cumulative impacts metric and is well documented. See August, L., et al., 2021. *CalEnviroScreen 4.0;* Report on the fourth version of CalEnviroScreen. California Office of Environmental Health Hazard Assessment: Sacramento, CA. Accessed 29 Oct. 2024 from the "CalEnviroScreen 4.0 Report" tab at https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40. Among other things, the report documents how data availability and quality were addressed among the many indicators used. For example, gray-shaded areas in Map C above (cross-hatched white shading in some of the CalEnviroScreen maps of the same area) indicates census tracts that OEHHA has designated "Top 20% pollution, no CalEnviroScreen score." *Id.*

Attachments

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