December 5, 2025

Mr. Matt Botill
Chief, Industrial Strategies Division
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on the November 6th Biofuels and Land Use Change Public Forum

Submitted electronically: https://ww2.arb.ca.gov/public-comments/lcfs-land-use-change-public-forum-november-6th-2025

Dear Mr. Botill:

The Clean Fuels Alliance America (Clean Fuels)[1] and California Advanced Biofuels Alliance (CABA)[2] appreciate the opportunity to provide comments on the Biofuels and Land Use Change Public Forum. Clean Fuels and CABA have been long-time supporters of the state's overall climate and air quality improvement goals and have collaborated frequently with CARB staff toward achieving those lofty goals. Our members, representing biodiesel, renewable diesel and sustainable aviation fuels, are responsible for over 74% of the volume and 56% of the credits in the LCFS in 2024.

Our longstanding presence in the California fuels market is why both Clean Fuels and CABA were highly disappointed in the most recent rulemaking in which CARB seemed to purposefully penalize the very fuels that has led to the LCFS' early success. The trifecta of anti-biofuels provisions – 1) refusing to update the indirect land use change values, 2) capping credit generation from crop-based biomass-based diesel, and 3) requiring

[1] Clean Fuels Alliance America (Clean Fuels) is the U.S. trade association representing the entire biodiesel, renewable diesel, and sustainable aviation fuel supply chains including producers, feedstock suppliers, and fuel distributors serving the on- and off-road applications, rail, marine, and heating oil markets. Made from an increasingly diverse mix of resources such as recycled cooking oil, soybean oil, and animal fats, the clean fuels industry is a proven, integral part of America's clean energy future.

[2] California Advanced Biofuels Alliance is a not-for-profit trade association promoting the increased use and production of advanced biofuels in California. CABA represents biomass-based diesel (BMBD) feedstock suppliers, producers, distributors, retailers, and fleets on state and federal legislative and regulatory issues.

onerous sustainability certifications for all crop-based biofuels – significantly hurt our industry throughout the supply chain, from the farmers to the feedstock processors, to the fuel producers and to the fleets that use the fuels. Since the completion of the rulemaking, we have turned our attention to implementation of the new provisions, attempting to bring our industry's expertise to the table to develop guidance that is both feasible and efficient for all parties involved.

CARB had the opportunity to correct one of their wrongs by hosting the public forum on biofuels and land use change on November 6th. Resolution 24-14 states:

> "Be it further resolved that the Board directs the Executive Officer to convene a public forum in the next 12 months on the latest science on land use change related to transportation fuels and the impact on greenhouse gas emissions, including the most commonly used models, such as the Global Trade Analysis Project (GTAP) model, and to consider how best to mitigate any risks of harmful land use impacts or food market conflicts identified, for consideration in a future LCFS update. This should include a public discussion and consider viewpoints from industry, environmental advocacy groups, academia, and government agencies such as the United States Department of Agriculture."

We were looking forward to a serious and balanced conversation and what we got instead was the same old story — one propped up by selective facts and philosophical bias – that failed to move beyond outdated assumptions about biofuels' relationship to land use. CARB had the opportunity to address the impacts of crop-based biofuels through the lens of the LCFS, but your failure to provide industry stakeholders with an opportunity to be a part of the forum left a gaping hole.

If we had been invited to present at the Forum, the audience would have learned that we seek to accelerate the adoption of clean fuels because:

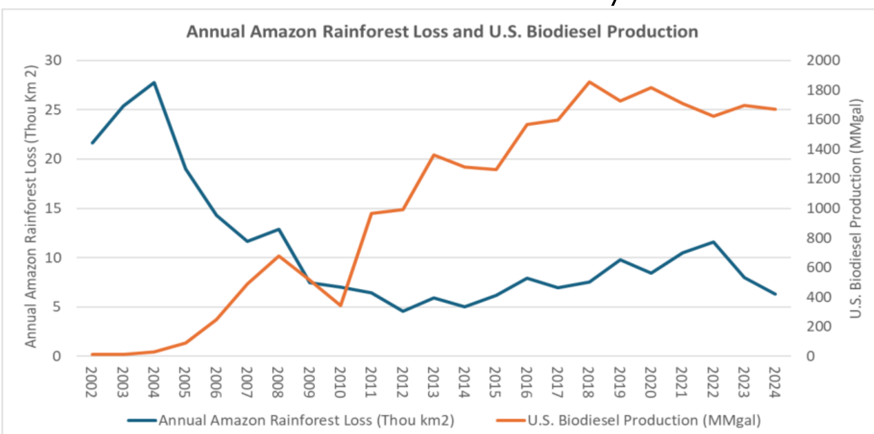
- Mitigating emissions now is substantially more valuable than doing so later – waiting five years to cut emissions requires over 13 times more reductions to have the same climate benefit.
- Good policy is a balance of environmental, social and economic aspects, not the environment at the expense of everything else.
- Biodiesel and renewable diesel offer a cost-effective path to decarbonize heavy-duty transportation by directly replacing petroleum diesel in existing engines and infrastructure, avoiding the high costs of new vehicle technologies or fueling systems.
- Crop-based fuels complement, not compete with, food production. For example, every 50 bushels of soybeans harvested yields 2,350 pounds of protein for food and 570 pounds of soybean oil for clean fuels.
- Responsible land stewardship across the globe matters.
- Agriculture *must* be a part of climate solutions.

The Data Clearly Show

The environmental outcomes that are asserted by many of the panelists simply are not true.

- A 45% jump in soybean yields since the 1990s added 15 billion pounds of soybean oil in 2025—exceeding U.S. biomass-based diesel demand in 2024—without requiring a single acre of new cropland.

- The jump in US biodiesel production also outpaced the amount of Amazon rainforest that has been lost over the last 15 years.



Source: Amazon Rainforest Loss - Brazil INPE PRODES (via Wikipedia); U.S. Biodiesel Production - U.S. EIA

- The volume of biomass-based diesel consumed in California in 2024 was approximately 2.7 billion gallons (approximately 1 billion gallons of those were soy- and canola-based) compared to the 3.04 billion gallons required by the renewable fuel standard. This suggests that no additional feedstock and thus land to grow them on was needed to comply with the LCFS.

Refuting the Chen, Sexton, and Smith Paper

- While the Chen et al. paper improves upon previous analyses of vegetable oil use in biomass-based diesel production, it lacks important detail on food uses and foreign domestic policies impacting the use of these oils that are particularly important to the type of analysis it runs to assess impacts. Importantly, lacking the appropriate level of detail in this type of analysis can exacerbate the uncertainty of the results. More to the point, lacking details on foreign domestic policies prevents the analysis from being able to draw conclusions about the specific impact of U.S. domestic BBD production/consumption on tropical deforestation.

- In both the public forum speaker remarks and the Chen et al. paper, the topic of vegetable oil substitutability was glanced over and continued to be referenced as if all vegetable oils are perfectly substitutable; however, this is not the case. For example, US and EU restrictions on palm oil for BBD production on the industrial side, and strong cultural preferences for certain vegetable oils on the food side prevent substitution for consumption except for on the margins. Clean Fuels is working on research into what those marginal substitution effects look like and is happy to share our findings with CARB in the future.

- Correlation is not causation. Agricultural commodity prices move together due to them having the same/similar inputs. Changes in the price of land, fertilizer, farm equipment, etc. affect all agricultural commodities and therefore will impact all their prices. These comparable inputs are probably a better explanation for the broader synchronization of commodity prices rather than substitutability.

ILUC is a theoretical estimate of emissions attributed to global land conversion modeled as induced by increases in crop-based fuel demand. We believe that CARB should move forward by either refining the current ILUC modeling or by reconsidering the methodology entirely.

Refining the Current ILUC Modeling

We recognize that CARB just finished its 3-year rulemaking process without touching ILUC values and thereby continuing their reliance on the 2014 version of the GTAP-BIO model. But the LCFS also states that CARB should use the best available economic and scientific information, which means that ILUC modeling, where employed, should be regularly updated. We encourage CARB to do what it can to stay true to that mission and, at a minimum, update its ILUC values with modeling that reflects the most recent understanding of:

- Relationships between global agricultural and energy economies.
- Global land cover and land use classifications and data trends.
- Land sector carbon stocks.
- Carbon cycling during land conversion.

While California continues to rely on global and energy economic information from 2004 for its ILUC values, the modelers at Purdue University have updated GTAP-BIO to better reflect the evolution of agriculture and energy markets since then, most recently with the global economy's state in 2017. They have also recently updated their carbon stock and carbon cycling methodologies to reflect the latest soil carbon databases and recommendations from the Intergovernmental Panel on Climate Change.

To capture the evolution in the modeling, Clean Fuels and Farmers Fueling the Future commissioned Life Cycle Associates to examine the Land Use Change Emissions Associated with Soybeans[3]. Figure 1 shows the evolution of ILUC values for soy biodiesel and renewable diesel for various regulatory schemes. It represents a long-run assessment of the global economy with many interactions between sectors and includes the following updates:

- More refined land use categorizations (cropland/pasture/forest)
- Improved nesting structures to distinguish intensification versus land use conversion
- Yield/land intensification updates to account for yield growth, multi-cropping, and cropping previously idle cropland
- Better trade/substitution elasticities
- Higher sector/region resolution from 57 to 65 sectors
- Integration of AEZ-EF v54 with updated 2019 IPCC factors

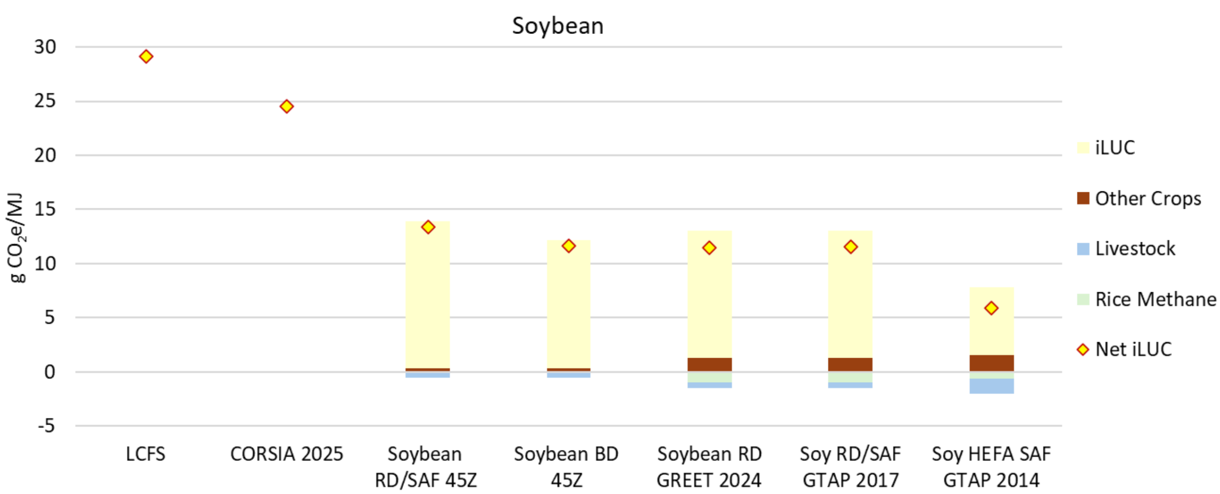


Figure 1. Various ILUC modeling results for Soy Biodiesel and Renewable Diesel

Incorporating these updates into its ILUC modeling seem particularly relevant to CARB's interests given the time spent at the forum discussing feedstocks grown on degraded pastureland and other Brazilian feedstock cultivation efforts, including multi-cropping. Neither of these circumstances are incorporated into the modeling underlying the current ILUC values but would undoubtedly have impacts on the relationship between the LCFS and LUC risk.

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[3] B.D. Healy, S. Unnasch, L. Goyal, Z. Duggal. (2025). Land Use Change Emissions Associated with Soybeans, Considerations for California's LCFS. Life Cycle Associates Report LCA.6276.1.2025. Prepared for Farmers Fueling the Future and Clean Fuels Alliance

Reconsidering the Methodology

ILUC modeling arose from reasonable concerns that large-scale displacement of fossil fuels with crop-based fuels could incentivize expansion of cropland onto natural ecosystems, thereby releasing stored carbon and threatening biodiversity. But the trajectory of modeling this risk has shown over time to be less and less of the threat originally raised. In a series of articles[4][5], Veronica Bradley, Clean Fuels' Director of Environmental Science, attempts to address the many flaws in how the modeling community is trying to quantify that risk and offers a new framework that captures the concerns of ILUC risks while rewarding stewardship, transparency, and continuous improvement across our supply chains. We believe that this approach should reflect key principles that guard against unintended consequences while enabling continuous improvement.

This framework and its implementation should therefore:

1. **Reflect the risk tolerance of the environment in which it operates.** U.S. programs in states with a heavy agriculture presence have more to gain in economic development than risk of inducing deforestation, so their policies should reflect that balance.

2. **Mitigate the risk of converting high carbon stock and biodiverse lands.** If the real concern is tropical deforestation because tropical forests are our planet's lungs, sequester the most carbon, and hold a disproportionate number of the world's known species, then we must focus on what is happening on the ground there.

3. **Be technology neutral.** The problem is not growing any specific agricultural commodity that contributes to clean fuel feedstock production, but rather any crop taking up the land of previously high-carbon stock and biodiverse land.

4. **Dynamically capture changing conditions at different geographical scales**. A U.S. produced biodiesel made from oil processed in the U.S. from soybeans grown in the U.S. where the local, state, and federal governments have not only restrictive land use laws but also strict enforcement mechanisms, should not be penalized. Conversely, a biodiesel made from soybean oil that has its roots in a region that has questionable land use laws or questionable enforcement of the laws on the books should be treated less favorably.

5. **Reward process improvements**. Effective decarbonization demands balancing social, economic, and environmental priorities while relentlessly pursuing better outcomes. This means centering our decisions on practices that improve the long-term sustainability of the land we depend on.

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[4] https://cleanfuels.org/rethinking-iluc-part-1-california-falters-on-clean-fuels/

[5] https://cleanfuels.org/rethinking-iluc-part-2-lessons-for-california-and-other-policymakers/

6. **Consider the informal economy and fraud prevention.** Even with good conservation laws in the books, governments' ability to prevent deforestation is only as good as their enforcement mechanisms that deter bad actors.

Global initiatives recognize the importance of traceable, deforestation-free supply chains. The EU Deforestation Regulation and Science-Based Targets initiative both restrict sourcing from land converted after 2020. By contrast, U.S. and California biofuels programs already require crop-based feedstocks to come from land cultivated before 2008 — twelve years earlier - which means that all domestic feedstocks come from legacy acreage that has been in production for at least the last seventeen years. If everyone else followed those same rules, there would be no ILUC value to assign to any crop-based fuels; all supply chains would be cleaned up; and the blame could no longer be misplaced. As it stands now, however, under the LCFS, U.S. feedstock producers are being penalized for tropical deforestation, even though their operations and supply chains are thousands of miles away.

Summary

While the LCFS is nestled at the nexus of climate, fuel, agricultural, land use and economic policy, CARB cannot realistically believe that it is responsible for resolving all the concerns each of these issues spearheads individually. It can, however, incentivize better outcomes by using its unique position at the center of all these policy topics to improve environmental outcomes of those it regulates, whether that is through better assigning LUC risk based on sourcing region or rewarding the benefits of intermediate oilseed feedstocks broadly and the practices of individuals farmers more specifically.

Clean Fuels and CABA thereby request the following:

- Initiate a Land Use Change Model Modernization Initiative in 2026 to continue the discussion regarding modeling updates as described above

- Confirm that used cooking oil should remain regulated under the specified feedstock provisions (as detailed in the comments submitted by Darling Ingredients)

- Clarify through guidance that novel winter annual and/or intermediate oilseed crops should not be assessed an ILUC (as detailed in the comments submitted by the novel winter annual and/or intermediate oilseed crops stakeholders)

Clean Fuels and CABA thank CARB staff for their continued efforts to strengthen the LCFS and provide the vision for the program to meet California's carbon neutrality goals. Thank you for your consideration of these comments. We look forward to continuing to collaborate with CARB staff.

Sincerely,

Cory-Ann Wind

Cory-Ann Wind
Director of State Regulatory Affairs
Clean Fuels Alliance America

Carlos Gutierrez
Executive Director
California Advanced Biofuels Alliance