August 27, 2024
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission: https://ww2.arb.ca.gov/lispub/comm/bclist.php

Re: Proposed Amendments to the LCFS

I. Introduction

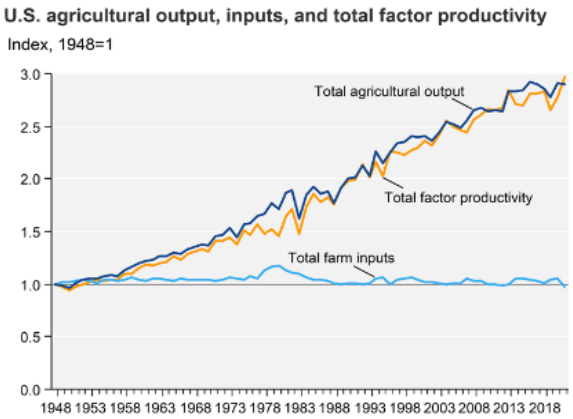
The Sustainable Advanced Biofuel Refiners (SABR) Coalition appreciates the opportunity to comment on the California Air Resources Board's (CARB) proposed changes to the Low Carbon Fuel Standard (LCFS) program. SABR is a national biodiesel trade association made up of nearly sixty organizational members from virtually every state including California, and most of whom do business in California. SABR's members have invested in building out America's first advanced biofuel. SABR members include stakeholders from every link in the value chain from feedstock growers to biodiesel producers, distributors, retailers, and consumers, as well as infrastructure and products and services suppliers. Biodiesel can be produced from a range of feedstocks, including oil from numerous oilseed crops.

SABR members include soybean farmers who produce the nation's most abundant biomass-based diesel feedstock in the United States. Soy oil is a highly sustainable feedstock. Unlike baseline petroleum diesel, which gets more carbon intensive each year, soy-based biodiesel gets less carbon intensive and more sustainable every year. The soybean industry invests heavily in plant science research that results in continuous yield improvements as well as drought and pest tolerance. US soybean farmers are among the highest adopters of technology improvements among all industrial sectors.[1] Farmers have adopted a broad range of precision agriculture technologies that allow them to use fewer energy and inputs to produce more crops on less land each year. See Figure 1.

[1] USDA, Economic Research Service, U.S. Soybean Production Expands Since 2002 as Farmers Adopt New Practices, Technologies. July 2023. https://www.ers.usda.gov/amber-waves/2023/july/u-s-soybean-production-expands-since-2002-as-farmers-adopt-new-practices-technologies/#:~:text=Soybean%20farmers%20also%20use%20many,application%20levels%20according%20to%20need.

These precision agricultural technologies and practices increase productivity and yield, enhance resilience to environmental changes, and reduce GHG emissions.[2] These practices incrementally build on existing practices, like cover cropping, nutrient management, and conservation tillage.[3] Other practices include, but are not limited to, fertilizer management and on-farm energy efficiency improvements (e.g., improved irrigation efficiency, reduced fuel use, and energy conservation).[4] For these and other reasons, SABR has significant concerns about CARB's proposed changes to the LCFS.

Figure 1:



Source: USDA, Economic Research Service, *Agricultural Productivity in the U.S.* data series. Data as of January 2024.

Technological developments in agriculture have been influential in driving changes in the farm sector. Innovations in animal and crop genetics, chemicals, equipment, and farm organization have enabled continuing output growth without adding much to inputs. As a result, even as the amount of land, labor, and other inputs used in farming declined, total farm output nearly tripled between 1948 and 2021.

II. Proposed Cap on Crop-Based Fuels

SABR's top concern is the proposed cap on soy and canola-based biomass-based diesel. This proposed measure is constructed around misplaced negative biases about modern production agriculture and based on contrived theories of indirect land use change (ILUC) that have not held up to nearly two decades of actual scientific evidence and data. The LCFS already has embedded layers of punitive measures against crop-based fuels which makes the LCFS program more expensive with no added benefit. The proposed cap will make the program even more expensive and incentivize even more imports, most notably from China at the expense of America's farmers and rural communities.

The theory of ILUC starts with the flawed assumption that when an agricultural material is used to produce a gallon of biofuel, then agricultural land is necessarily expanded causing a conversion of land from grassland or forestland to cropland. Figure 1 debunks that assumption. The US, as well as much of the rest of the world, is growing more crops on less acres nearly every year. And these crops are harvesting more CO2 and sunshine from the atmosphere every year to produce renewable energy. In the case of soybeans, a legume, they are plants that also harvest nitrogen from the atmosphere, breaking it down for its

[2] USDA, *Climate-Smart Agriculture and Forestry*, https://www.farmers.gov/conservation/climate-smart (last visited July 22, 2024).
[3] *Id.*
[4] USDA, *Climate-Smart Agriculture and Forestry Strategy: 90-Day Progress Report*, at 2 (2021), *available at* https://www.usda.gov/sites/default/files/documents/climate-smart-ag-forestry-strategy-90-day-progress-report.pdf.

own use and returning vital natural nutrients to the soil. This is why most soybean crops require little to no nitrogen fertilizer.[5]

Soybeans are approximately 20% oil and 80% protein meal. The 80% protein meal drives soybean production for food and feed uses. As more soybeans are grown, making more soybean oil available for more renewable, low-carbon biodiesel, the soybeans are co-producing more of the 80% protein meal making more of some of the healthiest and most efficient plant-based protein to feed the world. According to the USDA, the 2024 US soybean harvest will set an all-time record.[6] Soybeans are currently selling at $9.65 per bushel. That is in a similar range they were selling for twenty years ago in 2004 – *not* adjusted for inflation.[7]

III. ILUC Modeling Methods Must Be Reconsidered

ILUC theories and assumptions have been *modeled* for nearly 20 years to forecast future ILUC; those modeled forecasts have been used to assign penalties in real time in the form of carbon scoring to crop-based fuels. We now have the benefit of hindsight to look at two decades of historic data and determine whether the models produced accurate forecasts. They did not.

Just last month, eight scientists told the U.S. Court of Appeals for the District of Columbia Circuit that claims made that the Renewable Fuel Standard (RFS) program has led to the loss of habitat for endangered species and loss of grasslands are untrue.[8] The brief was filed in response to challenges brought by environmental groups to the 2023-2025 renewable fuel standards in *Center for Biological Diversity v. EPA*, Case No. 23-1277 (D.C. Cir. filed July 3, 2024). The scientists said, in the brief, that: "There is no compelling scientific evidence linking the RFS to the conversion of grasslands and loss of biodiversity. Research based on misclassifications of land use and flawed assumptions and methodologies spurred skepticism about the environmental and GHG emission reduction benefits of biofuels but that research has since been disproven."[9] Indeed, the scientists noted that "analyses based on more complete, updated data, found that the average carbon intensity of biofuels is significantly less than conventional gasoline," with this benefit "growing at an accelerated pace" as technologies and practices evolve.[10]

The International Standards Organization (ISO) also has recognized the uncertainty and lack of evidence of indirect emissions from biofuel production. "The conclusion, based on the expertise

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[5] Nitrogen-fixing crops, Wikipedia. https://en.wikipedia.org/wiki/Category:Nitrogen-fixing_crops#:~:text=Plants%20that%20contribute%20to%20nitrogen,lupins%2C%20peanuts%2C%20and%20rooibos.

[6] Record US Soybean Forecast for 2024, Worldgrain.com. https://www.world-grain.com/articles/20369-record-us-soybean-crop-forecast-in-2024#:~:text=The%20USDA%20on%20Aug.%2012,or%2010%25%2C%20from%202023.

[7] Soybean prices, 45-Year Historical Chart. https://www.macrotrends.net/2531/soybean-prices-historical-chart-data#google_vignette

[8] Todd Neeley, *Scientists: RFS Land Use Claims False*, Progressive Farmer, July 8, 2024, https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2024/07/08/scientists-push-court-reject-land.

[9] *Id.*

[10] *Id.*

of, and literature reviewed by, the work group, is that the 'state of science,' in terms of evidence-based research, is inconclusive or contradictory regarding indirect effects of bioenergy."[11] There also is substantial question as to whether the indirect effects of petroleum-based fuels have been adequately assessed. The ISO Work Group went on to say, "There has been more emphasis on sustainability and indirect effects of bioenergy than on fossil fuel scenarios. There needs to be equitable treatment of direct and indirect effects for any energy options being analyzed including baseline fuels."[12]

Equitable treatment of the baseline fuel is also a necessary part of any lifecycle analysis. It should be noted that since 2008, the hydraulic fracturing boom has caused land use changes from fracking wells that can be seen from nearly any domestic commercial airline flight. Yet this land use change from the baseline fuel, which can be seen with the naked eye, is often not included in emissions models for the petroleum baseline.

The RFS statute required that the EPA use 2005 petroleum carbon emissions as the baseline for comparison with measuring biofuel emissions. The EPA declined to include indirect emissions in the petroleum baseline and assumed them to be zero. Both EPA and CARB have historically and to this day cling to the theories that biofuels create significant indirect emissions and baseline petroleum creates no indirect emissions. These theories and assumptions did not factor in major technological developments in both the baseline petroleum and biofuel making both assumptions wrong.

The assumption that biofuels create ILUC emissions did not factor in major yield improvements as discussed above enabled by the broad adoption of precision agricultural technology and sustainable farming practices. And the assumption that there are no indirect emissions including ILUC from baseline petroleum did not factor in the development of hydraulic fracturing, horizontal drilling, and seismic metering, which, along with significant government subsidies, set off the fracking boom in the US. Fracking has improved the nation's energy independence and energy trade balance. ***But fracking has also created significant land use changes*** for baseline petroleum that can be seen from Google Earth. Continuing to follow the assumptions that crop-based fuels create land use changes and petroleum baseline fuels do not, is counter to the evidence.

IV. Updating Model Versions

The factors discussed above highlight the importance of using the most current data available rather than outdated and therefore incorrect data. If CARB is going to continue to attempt to

[11] ISO/Technical Committee 248 Sustainability Metrics for Bioenergy, Work Group 4 on Indirect Effects, 2015 State of Science Consensus Statement.
[12] *Id.*

model indirect emissions for biofuels, it is imperative that CARB adopt the most current version of the GTAP model.

CARB has indicated plans to update all major models for lifecycle emissions calculations except for GTAP-BIO in the upcoming LCFS amendments. The soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. Yet CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO2e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO2e/MJ for soybeans[13]. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based SAF in federal programs.

V. Double Counting of Indirect Emissions at the Federal and State Levels

The re-evaluation of indirect emissions modeling for crop-based biofuels becomes especially important when the Clean Transportation Production Credit (Section 45z) goes into effect in 2025. To the extent Section 45z embraces a California-style carbon intensity scoring system in its incentive structure, it will likely apply indirect land use change (ILUC) penalties to crop-based fuels. Currently approximately half of the nation's biodiesel and renewable diesel fuels (and nearly all the nation's SAF) are sold in California or one of the other states that have embraced a California-style LCFS state program.

Under the current expected approach, a gallon of biodiesel from soybean oil will have an ILUC penalty of 10 g/MJ of CO_2 for assumed land conversion (for which there is no conclusive scientific evidence) assigned at the federal level. If that same gallon is consumed in California, the same 10 g/MJ ILUC penalty is applied again to the same gallon under the LCFS, as if the gallon was burned twice and the same land was converted twice. The combination of the federal 45z and California LCFS will have assigned 20 g/MJ of CO2.[14] And this is the best-case scenario assuming that CARB updates its version of the GTAP-BIO model, which it has not indicated a willingness to do. If it does not, CARB will assign an ILUC penalty of 29.1 g/MJ of CO2, making a total combined ILUC penalty of 39.1 g/MJ on the gallon of soy biodiesel that is applied against the combined value stack of credits. This is nearly four times the amount of ILUC penalty that the GREET model has forecasted that a gallon of soy biodiesel should be assigned. When in reality there is no solidly consistent scientific evidence that the gallon of soy biodiesel will ever cause any land conversion.

This double (or rather, quadruple) counting is already happening today with SAF under the federal SAF credit (40B) combined with the California LCFS. Such a flawed policy is already leading to an alarming spike in questionable used cooking oil imports from China into California. These imports are displacing soybean oil, our nation's most abundant and sustainable agricultural feedstock. This outcome results in bad carbon policy, as well as bad agricultural,

[13] Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University

[14] A gallon of biodiesel contains approximately 125 MJ of energy. https://indico.ictp.it/event/8008/session/3/contribution/23/material/slides/2.pdf

energy, trade and economic policy. All of these factors make it critical that flawed indirect emissions modeling be re-evaluated using current science and actual scientific evidence. This reconsideration should rely on the hindsight of 20 years of data-gathering and actual science rather than relying on future forecasts, failed theories, flawed assumptions and outdated data. There has been twenty years to prove the theory that land use change would be caused by US crop-based fuels, but there is more evidence to the contrary.

VI. Biodiesel is the Lowest Cost, Lowest Carbon Fuel

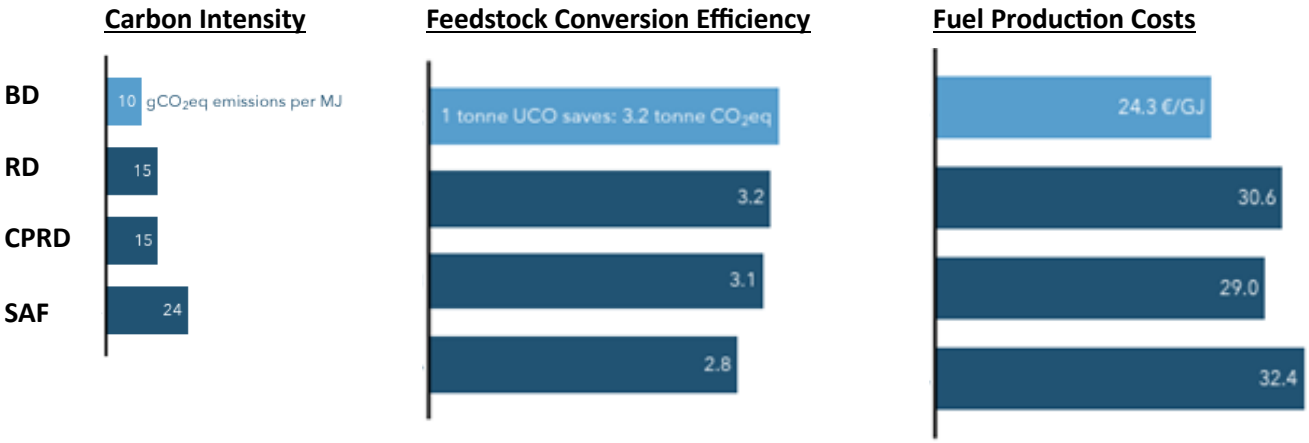
All of the biofuels that are regulated by CARB, fall under the umbrella of the federal RFS and count toward the RFS's annual volume requirements (renewable volume obligations "RVOs"). The RFS was intended to be a floor in the market, but it has become both a floor and a ceiling. This makes the annual RVOs roughly a finite number and a zero-sum game. Since the EPA has categorized biodiesel, renewable diesel, and SAF all in the same biomass-based diesel (D4) category, these fuels compete with each other to fill the volumes in the biomass-based diesel category on a national basis.

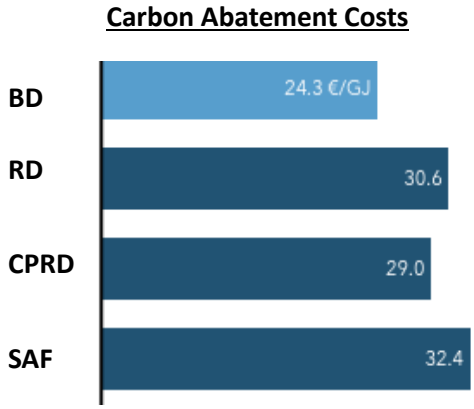
Since California currently represents roughly half of the nation's fuel volume that falls into that BBD category, and that portion is projected to grow, California has an outsized influence on the national market. SABR requests that CARB be mindful of how biofuel regulatory measures taken by California, combined with federal regulatory measures, can create market distortions on the entire US market. Advantaged treatment of SAF for example that results in more gallons of SAF made from imported UCO that comes online in California, means that a gallon of soy biodiesel goes offline somewhere else in the country. This effectively results in an increase in carbon since biodiesel is the lowest cost, lowest carbon biomass-based diesel.

A 2021 European study by a group of scientists in the Netherlands compared four biomass-based diesel fuels including biodiesel (BD), renewable diesel (RD), co-processed renewable diesel (CPRD), and sustainable aviation fuel (SAF).[15] The study was peer reviewed by prominent North American scientists. It compared fuel production costs, conversion efficiencies and carbon reduction abilities of the four fuels using the same feedstock (UCO in this case but the findings would apply to any feedstock when held constant) to determine which fuel was superior in carbon abatement. Their main finding: ***"We find that of all four pathways, biodiesel has the lowest production costs, the highest feedstock efficiency, the highest emission reduction performance and, consequently, the lowest carbon abatement costs."***

See charts below.

[15] Carlo Hamelinck et al., "Conversion Efficiencies of Fuel Pathways for Used Cooking Oil Study Commissioned by EWABA and MVaK Final Report," 2021, https://www.studiogearup.com/wp-content/uploads/2021/03/2021_sGU_EWABA-and-MVaK_Options-for-the-deployment-of-UCO.pdf.





When a gallon of RD or SAF replaces a gallon of biodiesel or BioHeat™ in the biomass-based diesel (D4) category of the RFS, carbon emissions increase by as much as 15% at an increased cost to taxpayers and consumers.

VII. Cite to other Comments

In addition to these comments, SABR supports the comments submitted by the American Soybean Association (ASA) and the National Association of Truck Stop Operators (NATSO).

VIII. Conclusion

SABR is very concerned about CARB's proposal to cap crop-based feedstocks in the LCFS program. This proposal is unjustified and not supported by scientific evidence and will significantly diminish the benefits of the LCFS policy. SABR urges CARB to reconsider its approach to ILUC modeling methods. The preponderance of the scientific evidence indicates that crop-based biofuel does not result in land use changes, and that the baseline petroleum does; yet CARB continues to assume the opposite. CARB has proposed updating all of its models to the most recent versions with the most current data sets, except for the version of GTAP-BIO it uses to measure indirect emissions of crop-based biofuels. If CARB is going to attempt to measure indirect emissions it is critical that it uses the most current data available. CARB should not

double - count carbon emissions assigned to crop-based fuels under the state LCFS program that have already been accounted for under federal biofuel programs.

Finally, CARB should be mindful of the outsized impact that its regulatory measures have on the entire nation's biomass-based diesel fuel and feedstock markets. And it should be mindful of how those regulatory measures interact with federal biofuel policies. All biomass-based diesel fuels only exist because of carbon policy, and biodiesel is the lowest cost, lowest carbon fuel. Biodiesel is a high performing oxygenated fuel that has demonstrated its ability to seamlessly integrate into the nation's infrastructure. Policy advantages given to SAF or RD in the LCFS for example that result in the cannibalization of biodiesel by those fuels, can have the unintended outcome of increasing carbon emissions at a higher cost to consumers and taxpayers.

We appreciate the opportunity to comment on these important policy matters. We thank you for your work and look forward to working with you going forward to help the LCFS realize its important carbon reduction goals. Please contact me if you have any questions.

Sincerely,

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