Advanced Biofuels CANADA
Biocarburants Avancés

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Cheryl Laskowski, Ph.D.
Chief, Transportation Fuels Branch
California Air Resources Board
1001 I Street Sacramento, CA 95814

RE: Crop-based fuels central to Low Carbon Fuel Standard (LCFS) targets

Dear Dr. Laskowski,

Thank you for the opportunity to comment on potential changes to the Low Carbon Fuel Standard Regulation.

Advanced Biofuels Canada is the national trade association for advanced biofuels and renewable synthetic fuels. Our organization has a deep appreciation of the Air Resources Board's critical leadership in decarbonizing fuels. Our members supply the California market with energy-dense, low carbon liquid fuels, primarily alternatives in the diesel fuel pool. We have worked closely with Canada's agricultural and forestry sectors to ensure that efforts to decarbonize transportation occur on a sustainable, durable basis.

Our organization has a long, detailed perspective on the questions raised by a limit on the use of crop-based biofuels. We were directly engaged over a period of five years in the development of an ISO standard, Sustainability Criteria for Bioenergy (ISO 13065:2015). We have also long advised Canadian federal and provincial governments on aspects of biofuel sustainability, some arising from the 2008 energy crisis that precipitated an examination of role of biofuels in food, feed, and other markets.

We wish to comment on aspects of the July 7, 2022, *Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard.* Our comments are directed at the potential limit on crop-based feedstocks for biofuel production and, specifically, a limit on use of lipid-based feedstocks.

<u>Scoping Scenarios – Economy-Wide Carbon Neutrality</u>

Air Resources Board (CARB) staff have evaluated four main scenarios for achieving economy-wide carbon neutrality by 2035 (Alternatives 1 and 2) and 2045 (Alternatives 3 and 4). ARB staff have recommended that the Board consider adoption of Alternative 3, which utilizes a broad suite of existing and emerging fossil fuel alternatives.

Specifically, Alternative 3 models a key role for liquid alternatives to petroleum fuels for decades, assuming billions of gallons annually of liquid renewable alternatives to gasoline, diesel, and jet utilization from 2025 through 2045. This would be a significant increase above current consumption rates in California. Energy-dense, liquid biofuels are delivering immediate greenhouse gas (GHG) and air quality benefits. This will not detract from state efforts to significantly expand electrification, hydrogen, and other alternative fuels. Indeed, biofuels give the compliance credit market liquidity, visibility, and

scale; these are all critical to emerging low carbon fuels.

Studies published in 2021 by UC Davis[i] and UC Santa Barbara show that a 2045 near-neutral transportation sector will be highly reliant on petroleum substitutes compatible with legacy on-road fleets, especially in hard-to-decarbonize sectors such as rail, long-haul transport (medium and heavy-duty trucking), aviation, and marine shipping. Renewable alternatives to gasoline are also important.

To the point, were a crop-based feedstock limit to be adopted, the impact on feasibility of the 2035 preferred scenario and 2045 near-neutral targets would need to be assessed carefully.

Our organization is very familiar with technology pathways either being deployed or in the development pipeline that will produce gasoline- and distillate-class low carbon fuels. Technology developers are pursuing pathways that will obviate the need for crop-based inputs by utilizing lower cost, sustainable feedstocks that can scale to meet climate action demand. For example, a number of synthetic fuel pathways are not reliant on crop-based feedstocks (e.g., biomass residues from forestry, agriculture, or CO_2 capture technologies). However, these pathways have yet to be demonstrated at scale; scaling up low carbon and sustainable biocrude and synthetic crude slates is underway, but capacity is not expected to be sufficient to offset lipid-based feedstocks for renewable diesel and SAF production by 2030. Further, the absence of significant renewable electricity in the state's power grid, and that of adjoining states, will likely delay commercial scale production of renewable synthetic fuels. We wish to be very clear that these fuels will play an indispensable role in the LCF to meet future targets but, at this point, plausible expectations of commercial deployment should be adopted.

Food prices and biofuels

Concerns about the impact of biofuels production on food crops is driven in part by a 'commodity super cycle' that has emerged with the inflationary impacts of the economic recovery from the coronavirus pandemic and the Russia-Ukraine conflict. Global commodity prices in recent months have started to ease, and there is an expectation that this trend will continue.

As was the case in 2008, when crude oil exceeded $160 per barrel, biofuels were scrutinized as a cause of increased food prices. In the years after 2008, it was widely understood that biofuels played a far smaller role that had been purported at the height of the energy crisis. It may well be the case that the current easing of crude oil and commodity price surges will likewise ease pressure on food costs.

Pandemic impact on biomass-based diesel costs

The significant increases in oilseed prices since March 2020 is partly a direct impact of the COVID-19 pandemic which significantly curtailed the production of animal fats and used cooking oils, as countries 'locked down' whole sectors such as hospitality. Other factors, such as labour shortages in palm oil harvesting, have contributed to elevated global lipid feedstocks.

The war in Ukraine has compounded the coronavirus' impact on global food commodities. Globally significant oilseed and cereals flows through the Black Sea are only starting to resume. This easing of export disruptions, and the expectation of further easing, is reflected in the overall Food Price Index dropped 13.3% in July. The FAO Vegetable Oil Index[ii] dropped 19.2% in July after a 7.6% drop in June , and the Cereal Price Index dropped 11.5%; these indexes also saw declines in the preceding three

consecutive months. While these indices are above levels from the previous year, new crop supplies are expected to continue to drive further declines.

Modelling Errors, Inaccuracies

Recent publications by Lark et al. (2020) and Zhang et al. (2021) have alleged large scale conversion of grassland to row crops in the United States, in part based on the USDA's Cropland Data Layer (CDL). Other analyses, such as the Plow Print analysis, have also tapped this dataset. Other researchers – including those from DoE's Argonne National Laboratories, and Southern Illinois University – have critiqued these studies, in part based on deficiencies in the CDL dataset. These critiques have assessed that estimated regional transitions between cropland and pastureland are statistically insignificant, and that market mediated responses (e.g., yield improvements) were not modelled. The USDA itself issued a warning in 2021 about using the CDL for assessments involving nonagricultural land cover categories, stating, "Unfortunately, the pasture and grass-related land cover categories have traditionally had very low classification accuracy in the CDL."[iii]

Other errors were reported, such as mis-characterizing frequent rotations between cropland and managed pastureland as conversion of natural land to cropland. National data show, in fact, that the total area of pastureland increased by 2.1 million acres between 2007 and 2012, and then decreased by 1.4 million acres in 2012-2017. This is despite the inclusion of all drivers of land use (including biofuels). The net increase in pastureland between 2007 and 2017 does not support the view that biofuels use in the US, and in CA, has driven land conversion.

Conclusion

We respectfully submit that a limit on crop-based biofuels should not be predicated on temporal impacts and inaccurate modelling, and that imposing such a limit would significantly imperil California's transportation sector GHG reduction targets. Further, adoption of a crop-based limitation would be a significant material change to the regulatory signal, with repercussions on low carbon fuel supply chain investments.

The LCFS program already has a well-developed indirect land use change model, and imposing an additional restriction appears unwarranted. Further, regenerative agricultural programs across the number of US states are reducing the carbon intensity of crop-based biofuels. Engaging the agriculture sector to be a champion of climate change is a laudable objective. The sentiment in US agriculture toward the LCFS has improved dramatically in the past decade; future opportunities for the farm sector will only strengthen its support for decisive climate action.

We believe that maintaining the stability of the LCFS program is critical to attracting innovative technologies, while incenting incumbent sectors to improve their environmental performance. The continuous improvement in lowering registered CI score of biofuels over the past decade demonstrates the positive impact of the LCFS regulatory design.

[i] Decarbonizing California Transportation by 2045 UC Davis (2021)
[ii] FAO Food Price Index
[iii] USDA CropScape and Cropland Data Layers FAQ (2021)