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Cheryl Laskowski, Ph.D.
Branch Chief – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: November 9, 2022, LCFS Workshop – Potential Changes to the Low Carbon Fuel Standard

Dr. Laskowski,

We appreciate the opportunity to provide feedback to potential changes on the Low Carbon Fuel Standard.

Fidelis New Energy, LLC ("Fidelis") is an energy transition company driving decarbonization through investments in renewable fuels, low-carbon intensity products, and carbon capture and storage. Using proprietary technology and processes, Fidelis aims to develop, invest, and deliver climate positive and carbon negative infrastructure to reach carbon reduction and climate positive targets. Fidelis develops carbon negative sustainable aviation fuel, renewable diesel, renewable naphtha, clean hydrogen, and clean ammonia infrastructure; in addition to developing and operating, CO2 capture units, pipelines, sequestration sinks, and related transportation and sequestration infrastructure.

We applaud the continued efforts of the California Air Resources Board to implement AB 32 and the continued success of the low carbon fuels standard, which has over-performed its target metrics, reaching a 9.36% carbon intensity reduction in 2021.

Fidelis encourages CARB to adopt more stringent CI targets as presented in the July 7th and November 9th workshops to encourage the continued success of the LCFS programs. These increased CI reduction targets would reduce statewide greenhouse gas ("GHG") emissions while providing strong market signals and leading to stable credit prices that support the additional innovation and investment required to support statewide emissions reduction targets.

Specifically, Fidelis supports the adoption of the carbon intensity benchmark schedule presented under alternative C:

Carbon Intensity Benchmark Reduction	***2030***	***2035***	***2040***
	35%	51%	69%

The LCFS market has been an overwhelming success to date delivering significant GHG reductions faster and at a modest price, the average price per credit was only $106[1] for the month of October this year. This credit price in addition to the carbon intensity reduction of 9.36% in

[1] *Monthly LCFS Credit Transfer Activity Report for October 2022.*
https://ww2.arb.ca.gov/resources/documents/monthly-lcfs-credit-transfer-activity-reports

2021 and the cumulative credit bank exceeding 10 million metric tons through Q2 2022, [2] should give CARB the confidence that the market will continue to respond by supplying low carbon, clean fuels to support these meaningful GHG benchmark reduction targets.

Additionally, there are long term costs associated with delaying the carbon intensity reductions benchmarks. California's transportation sector has historically been responsible for 50% of GHG emissions, 80% of NOx Emissions, 95% particulate matter ("PM") emissions. The significant reductions in toxic and hazardous air pollutants like PM and NOx seen in California are largely driven by the adoption of clean burning fuels like renewable diesel. As referenced in the 2022 Draft Scoping Plan, these emission reductions have major health benefits, including the reduction in premature pollution-related deaths.[3] Adopting the stringent carbon intensity benchmark reductions outlined in alternative C, will accelerate the reduction of co-pollutant emissions from the transportation sector, reducing premature pollution-related deaths.

Fidelis strongly supports and believes in continuous evaluation of sustainability across all technologies and feedstocks – which is the foundation of CARB's LCFS legislation. However, despite overwhelming written public comment consensus against adopting a limit on crop-based biofuels, CARB's California Transportation Supply ("CATS") model Alternatives A and B, presented on November 9th, include this component. Potentially adopting this virgin-oil biofuel limit ignores science-based examinations of crop-based biofuel sustainability and signals a worrisome departure from LCFS' technology-neutral approach. This historical stance has led to the program over-performing on emission reduction targets to date – leading the way for other states, regions, and countries like Canada to follow California's impressive leadership role on environmental, public health, and safety matters. Imposing a cap would ignore several key advancements in crop-based biofuels such as drastic improvements in crop growth and environmental outcomes, the important role many high protein crops play in supporting low-cost animal feed, the development of secondary crop rotations and non-food crops, and other innovative farming techniques. A cap would oversimplify and dramatically inflate the "Food v. Fuel" concern, as well as ignore the existing carbon intensity-based framework for handling any potential adverse impacts of crop-based biofuels through induced land use change ("ILUC") values.

Caps on crop-based biofuels ignore significant improvements in both farming yield and sustainability. Improvements in U.S soy farming between 1980 and 2015 led to a 120% increase in soybean production, while land use per bushel decreased by 40% and energy use decreased by 35%. These advancements led to an overall greenhouse gas emissions decrease of 45% per bushel. Reductions that stemmed from a significant improvement in soybean yields also resulted in both soil and water conservation, improving by 47% and 33%, respectively.[4] As highlighted in the *Field to Market: Alliance for Sustainable Agriculture* report, crops across the board have seen increased yields and improved environmental performance. These advancements maximize the availability and sustainability of crop production for food, feed, and biofuel demand.

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[2] https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentation.pdf
[3] 2022 Scoping Plan Update (ca.gov)
[4] Field to Market: The Alliance for Sustainable Agriculture, 2016. *Environmental and Socioeconomic Indicators for Measuring Outcomes of On Farm Agricultural Production in the United States (Third Edition).*

A cap on crop-based biofuels also ignores the numerous positive environmental impacts amplified by sustainable farming through the broader adoption of cover crops (like pennycress, camelina, and carinata as well as canola when grown as winter cover crop in southern United States), innovative land management practices, and utilization of marginal acreage. These innovative practices, termed "Low Land Use Change Risk Practices" under the International Civil Aviation Organization's ("ICAO") Carbon Offsetting and Reduction Scheme in International Aviation ("CORSIA"),[5] have numerous widely recognized environmental impacts even before considering the additional production of biofuels: soil improvement, erosion prevention, weed and pest control, and increased biodiversity.[6,7] These are all in addition to cover crops being planted off-season from the main food-based crop, thus not interfering with the main growing season. Since it is an edible oilseed, utilizing canola as a winter cover crop has the added benefit that of boosting the total amount of food, feed, and fuel produced without increasing the number acres cultivated. Additionally, canola has a very high oil yield of ~46% compared to soybean oil yields of ~18%; thus, canola is an excellent addition to increasing the overall food and fuel security while helping combat the causes of climate change. As illustrated, capping crop-based biofuels does not align with scientific consensus that biofuels from cover crops have numerous positive environmental impacts in addition to supplying clean transportation fuels and displacing fossil fuels, and a cap on crop-based biofuels would decrease the adoption of these positive impact practices.

In addition to ignoring the improvements of crops yield and innovative farming practices, a cap on virgin oil-based biofuels overlooks the importance that these biofuels often have on the prices of co-product animal feed and over inflates the impact biofuel production has on the price of crops and food, which are both more directly correlated with the price of crude oil. For example, soy and canola-based biofuels are often the focus of proponents of capping virgin oil feedstocks, which often ignore the positive impact that utilization of these crops in biofuels have on supplying low-cost protein meals for animal feeds and over inflate the price impact that soy oil has on food costs. The USDA projects 9.8%, 11.4%, and 16.7% growth in global consumption of beef, pork, and poultry, respectively, between 2023 and 2031[8]. Supporting demand for protein rich livestock feed requires steady expansion of protein-rich crops like Soybeans and Canola. Without the support of biofuels, protein supply for livestock feed would see dramatic increases in pricing that would radiate throughout the value chain, impairing both farmers and consumers negatively and avoiding an advantageous optimization opportunity that is mutually beneficial for lowering both food and meal prices for the meat supply chain.

Beyond helping to lower the cost of animal feed, the price of soybean oil has an insignificant impact on the cost of food whereby food costs are more correlated to fossil crude oil. USDA data shows that consumers are relatively insulated from farm costs, with farmers,

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[5] ICAO (2022). *CORSIA Methodology for Calculating Actual Life Cycle Emissions Values.*
[6] USDA Northeast Climate Hub. *Cover Cropping to Improve Climate Resilience Fact Sheet*. https://www.climatehubs.usda.gov/sites/default/files/CoverCropsFactsheet_Feb2019_web508.pdf
[7] Sustainable Agriculture Research & Education (2007). *Managing Cover Crops Profitably Third Edition.*
[8] USDA (February 2022). *USDA Agricultural Projections to 2031*. https://www.usda.gov/sites/default/files/documents/USDA-Agricultural-Projections-to-2031.pdf

receiving approximately $0.16 for every $1 food dollar spent.[9] Research by the American Soybean Association has shown that if the price of soy oil were to double, the price impact to retail food prices would be 0.34% for bread and 2.6% for chips, assuming that retailers do not switch to a substitute vegetable oils, further illustrating the mitigated correlation. The price of soybeans doubling due to biofuel consumption is not supported based on historical trends of soybean prices as illustrated below.

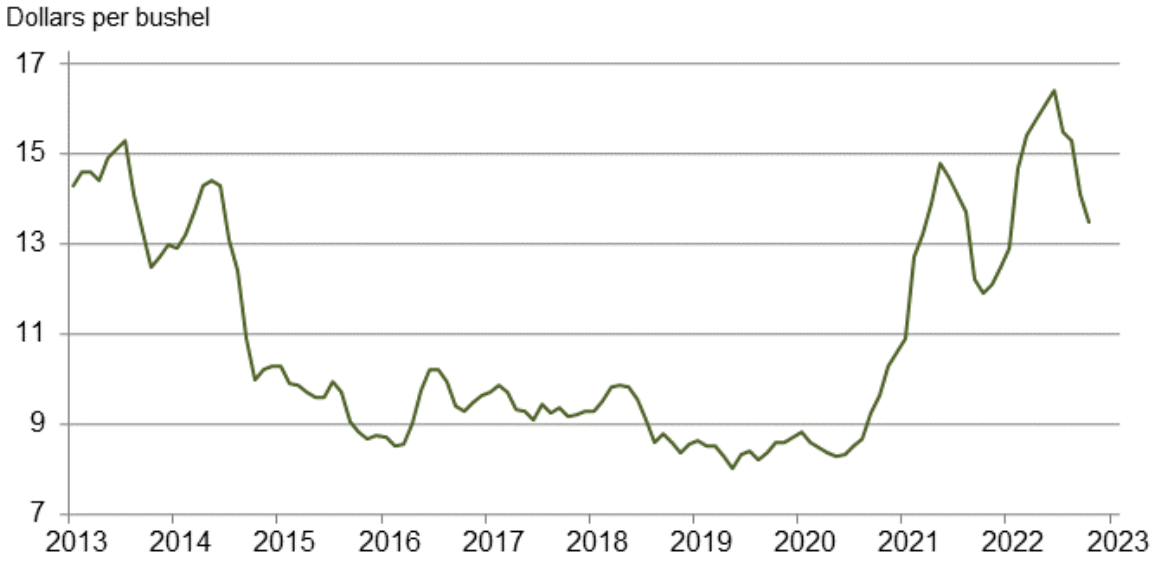

Figure 1. Prices received for Soybeans by Month - United States[10]

Even with the adoption of RFS in 2005, and California's LCFS in 2009, soybean prices fell from a peak in 2013, at approximately $15, to under $9 per bushel in 2016 where it was relatively consistent until rising in mid-2020, largely following the broader commodity markets with the COVID 19 pandemic. This shows that while there was significant, consistent, expansion of crop-based biofuels within the US with the production of biodiesel expanding from 0.7 billion gallons to 1.8 billion gallons between MY 2010-2011 and MY 2017-2018 period, there was no clear correlation to the movement of the soybean price, which is the most commonly used vegetable oil for biodiesel production.[11] Further, the pricing data illustrates that that even with the demand for biomass diesel during this period increasing, the soybean prices halved, illustrating that food pricing was not impaired by the biofuel industry growth. Soybean prices follow the broader commodity markets, including food and crude oil, which generally trend together based on global economic impacts, not a specific utilization of the soybean oil for biofuels.

[9] National Farmers Union (August 2017). https://nfu.org/wp-content/uploads/2014/12/083017-FarmerShare.pdf
[10] UDSA NASS (November 2022). Prices Received for Soybeans by Month – United States https://www.nass.usda.gov/Charts_and_Maps/Agricultural_Prices/pricesb.php
[11] EIA (May 2019). *Soybean Oil Comprises a Larger Share of Domestic Biodiesel Production*. https://www.eia.gov/todayinenergy/detail.php?id=39372

Furthermore, analysis of soybean prices from the introduction of the RFS in 2006 show that soybean oil and crude prices move in tandem - with 62% of the variation in Soybean oil prices explained by crude oil prices, proving biofuel expansion is not the driver for movement in vegetable oil pricing. This analysis is supported by research proving 64.17% of food price variance is explained by crude oil price movements.[12] It appears that biofuels are a positive catalyst for the farming industry through a consistent, profitable demand to support value creation and promote a resource to counteract the crude pricing impacts that the farming industry lacks control over.

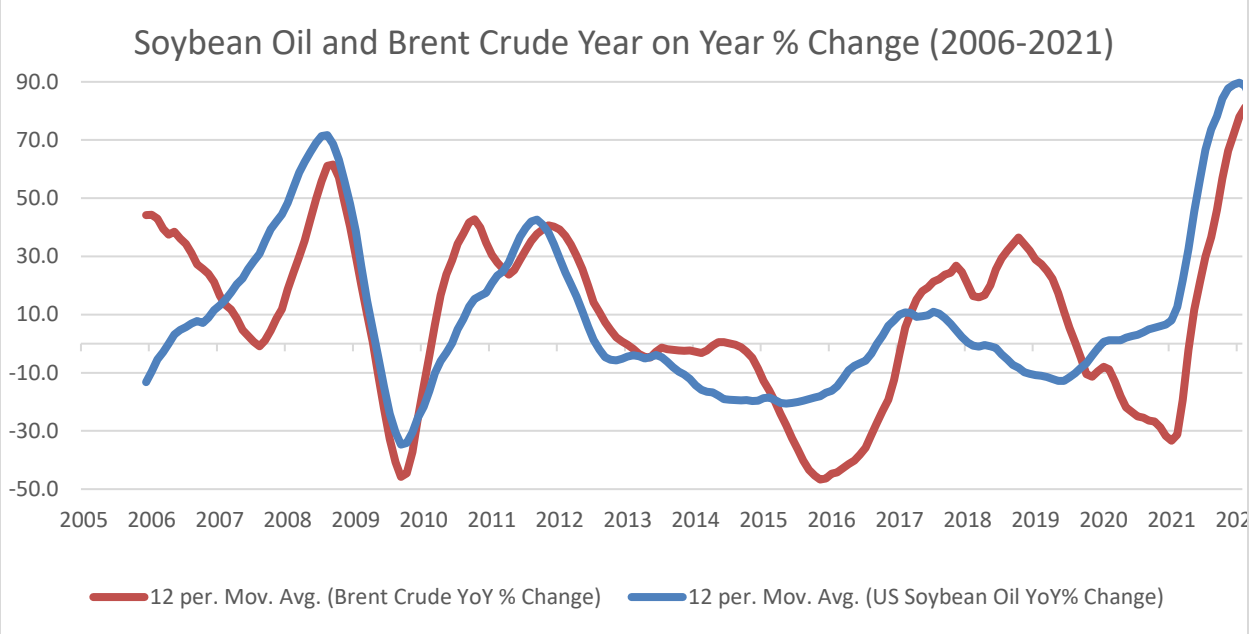

Figure 2. Soybean Oil and Brent Crude Year on Year Percent Change (2006-2021)[13]

Capping crop-based biofuels runs in contradiction to the CARB 2022 Scoping Plan and Executive Order N-79-20 which both highlight the need of renewable fuels. The 2022 Scoping plan expects that in 2045 only 20% of aviation fuel demand is met by electricity or hydrogen, with the remaining demand met by sustainable aviation fuel. Placing a cap on crop-based biofuels could prevent the required supply of sustainable aviation fuel needed to displace fossil jet fuel currently and, in the future, in addition to those potentially needed in the event of delays in development for hydrogen and electric alternatives. Additionally, Executive Order N-79-20 explicitly directs the transition expedited regulatory process for the repurposing and transition of upstream and downstream oil production facilities in California. The main avenue to repurpose legacy oil and gas assets is to produce sustainable aviation fuel, renewable diesel, and hydrogen to avoid emission leakage, as stated in the 2022 Scoping Plan. This transition to SAF and RD production will require crop-based biofuels including both developing cover crop-based bio-oils and traditional oil crops in addition to waste oil and greases. A cap on crop-based biofuels stands

[12] Taghizadeh-Hesary, et al. (2019) *Energy and Food Security: Linkages through Price Volatility*. Energy Police, Volume 128, pages 796-806. https://doi.org/10.1016/j.enpol.2018.12.043.
[13] Data sources: FRED (https://fred.stlouisfed.org/), International Monetary Fund Primary Commodity Prices

in opposition to the CARB's 2022 Scoping Plan and Governor Newsom's executive order N-79-20.

Similarly, the proposed cap on crop-based biofuels, ignores the existing mechanism of addressing concerns with crop-based biofuels through the assignment of iLUC emission factors to certain crop-based biofuels to address indirect market impacts and the associated greenhouse gas emissions. Assigning iLUC values where applicable, enables a neutral comparison of technologies and fuels in the LCFS market and delivers the maximum reduction in both GHG emissions and air pollutants. Fidelis encourages CARB to utilize the existing iLUC mechanism along with adopting more stringent CI benchmark reductions, which will set a in inherit cap on credit generation for inefficient pathways utilizing crops with iLUC values.

Fidelis supports the continued examination of the sustainability for all technologies and feedstocks through a technology-neutral, science-based approach which allows stakeholders to innovate and supply the lowest cost, highest impact emissions reduction fuel pathways.

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Thank you for the opportunity to submit these comments on potential LCFS rulemaking changes. We welcome the opportunity to meet with CARB staff to discuss these issues in greater detail and to answer any questions that you may have.

Respectfully submitted,

Fidelis New Energy, LLC