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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: February 22, 2023, 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 wells, 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. Our comments on proposed changes to the Standard are as follows:

# Fidelis' Supports Aggressive CI Benchmark Carbon intensities.

The Low Carbon Fuel Standard has doubled the volume of low carbon fuels over the past ten years, diversified the fuel supply mix in California, and has overperformed compliance targets. This overwhelming success of the program supports long term aggressive carbon intensity benchmark as well as near term strengthening measures. Fidelis encourages CARB to adopt the compliance targets as modeled in the February workshop of 30% by 2030, 45% 2035, 65% by 2040, and 90% by 2045. Through these compliance targets, CARB will enable continued investment and development of low carbon fuels and deliver material reductions in transportation emissions.

In addition to these future compliance targets, Fidelis recommends that CARB consider a onetime stepdown in the benchmark carbon intensity near term to address the rapid accumulation of excess credits. Of the 13.4 million credits in the cumulative bank, 4.7 million excess credits were added to the cumulative bank in the four-quarter period ending in Q3 2022.<sup>1</sup> With the average quarterly deficit generation over this period being 5.1 million credits, the credit

<sup>&</sup>lt;sup>1</sup> Data Source: CARB (February 2023) LCFS Dashboard (<u>https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard</u>)

generation was outpacing deficits by almost an entire quarter of expected deficit generation. Fidelis recommends that CARB takes near term action to address this growth through a stepdown in the compliance benchmark for 2025. This step down will provide market confidence in credit pricing enabling near term investments required to support the strengthened carbon intensity requirement.

### **Fidelis Supports a Compliance Target Acceleration Mechanism**

As stated above, 35% (4.7 million) of the 13.4 million credits cumulatively banked from the program's inception were generated in the four-quarter period ending in Q3 2022. Based on the rapid accumulation of credits, Fidelis encourages CARB to consider an acceleration mechanism to reduce compliance targets based on the performance of the LCFS market. This acceleration mechanism will ensure market certainty for industry to develop and deploy the required low carbon fuel infrastructure and ensure that emissions are rapidly, but feasibly, reduced to deliver both climate and air quality improvements to Californians.

### Fidelis supports the adoption of intrastate jet fuel as a deficit generator.

Through the LCFS program, California has been the global leader in the deployment of low carbon fuels. With the incentivization of SAF in the Inflation Reduction Act encouraging significant deployment of SAF facilities and alternative Jet fuel generating credits in the LCFS market since 2019, Fidelis encourages California to once again lead the deployment of alternative jet fuel (SAF) at scale by making conventional Jet Fuel a deficit generating fuel when used on intrastate flights. This amendment will directly incentive the utilization of alternative jet fuel at scale resulting in decreased greenhouse gas emissions and improved air quality.

#### Fidelis does not support a cap on crop-based biofuels.

Fidelis supports the continued examination of the sustainability for all technologies and feedstocks through a technology-neutral, science-based approach. This technology neutral approach to examining the sustainability of fuel pathways has been the catalyst for the success of the California LCFS program. The current consideration of a discussion on crop-based biofuel sadly departs from this technology-neutral, science-based examination as well as ignores the existing Indirect Land Use Change carbon intensity based regulatory mechanism established to address the concerns of the biofuel driven expansion of crop land.

As iterated in our comments on the November 9, 2022, comments, Fidelis does not support a cap on crop-based biofuels. To summarize our previously submitted comments, the current discussion on an overall cap on crop-based biofuels fails to acknowledge the significant improvements in farming yield and sustainability; ignores the important market dynamic that oilseed crops have on lowering co-product animal feed; and disincentivizes the adoption of further sustainable practices such as the broader adoption of cover crops, utilization of marginal acreage, and innovative land management practices (intercropping, sequential cropping).

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.<sup>2</sup> 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.

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<sup>3</sup>. 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.

<sup>&</sup>lt;sup>2</sup> 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).* 

<sup>&</sup>lt;sup>3</sup> USDA (February 2022). USDA Agricultural Projections to 2031. https://www.usda.gov/sites/default/files/documents/USDA-Agricultural-Projections-to-2031.pdf





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.<sup>5</sup> 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.

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, demonstrating that biofuel expansion is not the driver for movement in vegetable oil pricing. This analysis is supported by research showing that 64.17% of food price variance is explained by crude oil price movements.<sup>6</sup> It appears 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.

<sup>&</sup>lt;sup>4</sup> UDSA NASS (November 2022). Prices Received for Soybeans by Month – United States <u>https://www.nass.usda.gov/Charts and Maps/Agricultural Prices/pricesb.php</u>

<sup>&</sup>lt;sup>5</sup> EIA (May 2019). Soybean Oil Comprises a Larger Share of Domestic Biodiesel Production. https://www.eia.gov/todayinenergy/detail.php?id=39372

<sup>&</sup>lt;sup>6</sup> Taghizadeh-Hesary, et al. (2019) *Energy and Food Security: Linkages through Price Volatility*. Energy Police, Volume 128, pages 796-806. <u>https://doi.org/10.1016/j.enpol.2018.12.043</u>.



*Figure 2. Soybean Oil and Brent Crude Year on Year Percent Change (2006-2021)*<sup>7</sup>

Capping crop-based biofuels contradicts both the CARB 2022 Scoping Plan and Executive Order N-79-20 which both highlight the need for 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 in opposition to the CARB's 2022 Scoping Plan and Governor Newsom's executive order N-79-20.

Slide 39 of February's workshop presentation,<sup>8</sup> exemplifies the oversimplification of the discussion on crop-based biomass diesel. While it is accurate that 38%<sup>9</sup> of the US soybean oil produced was utilized in biofuel production with the remainder being used in various food applications, it is grossly inaccurate to attribute >35 million acres of soybean production to biofuel as implied by the figure on slide 39. This oversimplifies a complex market with

<sup>&</sup>lt;sup>7</sup> Data sources: FRED (<u>https://fred.stlouisfed.org/</u>), International Monetary Fund Primary Commodity Prices <sup>8</sup> CARB (February 2023) LCFS Presentation 02 22 2023.

https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs\_meetings/LCFSpresentation\_02222023.pdf <sup>9</sup> Data Source: USDA (March 2022) Oil Crops Yearbook (<u>https://www.ers.usda.gov/data-products/oil-crops-yearbook/</u>)

numerous segments (soybeans, meal, and oil) by incorrectly attributing the total soybean acreage to solely soybean oil (SBO) production.

Based on the Oil Crop Yearbook estimates for 2022 of the 4,435 million bushels of soybean produced domestically approximately 50% was crushed domestically and 47% exported with a remaining 3% as Seed, Feed, and Residual. Applying the 2020/2021 crush yield data both on a mass yield basis and a value allocation basis, Figure 3 presents the 2022 harvested soybean acreage allocated by end use of the produced soybean bushels; clearly illustrating that soybean acreage cannot be simplified to be soybean oil production.



Figure 3. Harvest Acreage Allocated by End Use<sup>10</sup>

Furthermore, soybean meal, rather than oil, is the primary value driver for soy acreage planting nominations and assessing the demand for soybeans and soy products. When soybeans are crushed, roughly 80% of the product yield is meal, with the remaining 20% accounting for oil on a mass basis. To help illustrate the importance of soy meal in the economic equation, the settle prices for CME Group soybean meal and soybean oil March 2023 contracts on March 13<sup>th</sup>

<sup>&</sup>lt;sup>10</sup> Data Source: USDA (March 2022) Oil Crops Yearbook (<u>https://www.ers.usda.gov/data-products/oil-crops-yearbook/</u>)

were \$492.20/ton and \$0.5534/pound (1,106.80 \$/ton), respectively<sup>11</sup>. Even though soybean oil is priced higher on a per-ton basis, it only accounts for ~36% of the total revenues generated from soybean products (\$393.76 vs. 221.36 for meal and oil, respectively, using the March 13<sup>th</sup> prices provided). As seen in figure 4, this value largely reflects the average annual value generation split over the historical data available in the USDA Oil Crops Yearbook, which has remained relatively consistent even with the expansion of soybean oil utilization in biofuel production. While the oil is a valuable coproduct, it constitutes only ~36% of the products and revenues generated through soy growth and crush, and therefore is not the sole driver of the decision to grow and crush more soybeans.



Figure 4. Historical Annual Average Soybean Crush Value Contribution - Oil vs. Meal & Hulls<sup>12</sup>

Fidelis recommends that CARB utilize the existing regulatory mechanism of indirect land use changes to ensure that sustainable production of crop-based biofuels and capture any induced emissions. This mechanism along with stringent carbon intensity targets will allow stakeholders to innovate and supply the lowest cost, highest impact emissions reduction fuel pathways.

## Fidelis supports a Carbon Intensity based book and claim threshold.

Fidelis encourages CARB to adopt solely carbon intensity-based book and claim thresholds for the qualification of book and claim hydrogen. Carbon intensity-based limits for the participation of book and claim, will incentivize innovation and enable the delivery of low carbon hydrogen at scale sooner by enabling all feedstocks and pathways.

<sup>&</sup>lt;sup>11</sup> Data Source: CME Group (https://www.cmegroup.com)

<sup>&</sup>lt;sup>12</sup> Data Source: USDA (March 2022) Oil Crops Yearbook: <u>https://www.ers.usda.gov/data-products/oil-crops-yearbook/</u>

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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