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(Letter submitted electronically as Comment to LCFS Public Workshop)

Request to Address Alternative Jet Fuel Crediting in LCFS Rulemaking

Dear Richard, Rajinder, and Arpit,

This letter is submitted on behalf of the sustainable aviation fuel (SAF) producer group. The SAF Producer Group is composed of many of the world's leading companies producing SAF or developing SAF production facilities, including Fulcrum BioEnergy, Gevo, Red Rock Biofuels, Velocys, and World Energy. These same companies participated in the last major Low Carbon Fuel Standard (LCFS) rulemaking, and supported the inclusion of alternative jet fuel (AJF)[1] in the LCFS on an opt-in basis. The SAF Producer Group would like to commend the California Air Resources Board (CARB) for CARB's decision in that rulemaking to integrate AJF uplifted in California into the LCFS. CARB's policy leadership regarding SAF has firmly established California as the leading SAF state in the country from both a supply and demand standpoint, and has placed California in the top tier of locations globally supporting the expansion of SAF.

We would like to request the opportunity to provide a brief presentation on the proposed regulatory change discussed in this letter as part of the focused stakeholder feedback scheduled for the October 15th LCFS workshop.

[1] The LCFS defines the term "Alternative Jet Fuel" at 17 CCR §95481(a)(6) to mean: "a drop-in fuel, made from petroleum or non-petroleum sources, which can be blended and used with conventional petroleum jet fuels without the need to modify aircraft engines and existing fuel distribution infrastructure." While there are nuanced distinctions between the LCFS defined term "alternative jet fuel" and "sustainable aviation fuel," this comment letter uses the terms interchangeably. Note that all further regulatory references are to 17 California Code of Regulations.

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Background

As you will recall, one of the concerns that CARB leadership expressed in the prior LCFS rulemaking was that the inclusion of AJF in the LCFS might divert significant quantities of low carbon fuel production from the on-road/renewable diesel market to the aviation/ SAF market. Based on over a year and half of experience since SAF became eligible for LCFS credits, the market has clearly demonstrated that this risk has not materialized. According to LCFS data, the volume of renewable diesel supplied to California in 2019 exceeded the volume of AJF by a factor of approximately 500x.[2] The reasons for this relatively slow uptick in SAF utilization in California are explained by this letter, and establish that California can rely on an ample supply of renewable diesel for on-road purposes. In addition to the historical growth of renewable diesel, the reliability of future renewable diesel supply is reinforced by the series of announcements in 2020 of large-scale renewable diesel production plans by petroleum market participants.[3]

Regarding SAF, however, the current growth trajectory falls far short of what is necessary to achieve necessary GHG reductions. As Board Chair Mary Nichols stated when SAF was added to the LCFS in 2018, "These amendments will take California's climate fight up another notch. The addition of credits for alternative aviation fuels makes the program more flexible and adds a major source of potential greenhouse gas reductions."[4] Consistent with CARB's objectives of achieving substantial reductions of GHG emissions via SAF, San Francisco Airport (SFO) has set a goal of expanding SAF use in California to 5% by 2025. Achieving this goal will require 200 million gallons of SAF per year (MGY) by 2025. While this goal of 200 MGY represents only about one-third of California's 2019 renewable diesel supply, it requires almost a 100x scaling of SAF production compared to 2019 SAF volumes to be achieved.

Factors Limiting SAF Market Growth

There are multiple factors that limit SAF growth. Remarkably, neither technical approval of SAF nor airline acceptance of SAF represent significant barriers to market expansion. ASTM International, the standards body that approves new fuels, has approved seven different fuel processing technologies that utilize a wide range of sustainable feedstocks pursuant to ASTM's D7566 Annex standard. This specification allows blending of approved SAF fuels with conventional Jet-A fuel to be used in standard commercial aircraft with no modifications required.[5] On a global basis, commercial airlines and business aviation have embraced SAF and

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[2] California Air Resources Board website, Low Carbon Fuel Standard Data Dashboard, at https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm , Alternative Fuel Volumes and Credit Generation, data spreadsheet downloaded from http://ww3.arb.ca.gov/fuels/lcfs/dashboard/figure2_053120.xlsx (last viewed September 17, 2020).

[3] See e.g. Phillips 66 News Releases, "Phillips 66 Plans to Transform San Francisco Refinery into World's Largest Renewable Fuels Plant," August 12, 2020, at https://investor.phillips66.com/financial-information/news-releases/news-release-details/2020/Phillips-66-Plans-to-Transform-San-Francisco-Refinery-into-Worlds-Largest-Renewable-Fuels-Plant/default.aspx

[4] CARB Public Information Website, "CARB amends Low Carbon Fuel Standard for wider impact," September 27, 2018, at https://ww2.arb.ca.gov/news/carb-amends-low-carbon-fuel-standard-wider-impact

[5] Commercial Aviation Alternative Fuels Initiative, " Approved Fuels further described in Fuel Qualification Page" include **Annex A1**: Fischer-Tropsch Synthetic Paraffinic Kerosene (FT-SPK) (2009 certification, synthesis gas as feedstock); **Annex A2**: Hydroprocessed Esters and Fatty Acids Synthetic Paraffinic Kerosene (HEFA-SPK)(2011 certification; fats, oils and greases are feedstocks); **Annex A3**: Hydroprocessed Fermented Sugars to Synthetic Isoparaffins (HFS-SIP)(2014 certification, sugars as feedstock); **Annex A4**: Fischer-Tropsch Synthetic Paraffinic

supported market expansion through demonstration flights, public education campaigns, investment in companies developing SAF facilities and companies, and support for SAF policy.[6] Indeed, Airlines for America was the original proponent for including AJF in California's LCFS and was an active participant in the LCFS AJF effort along with United Airlines, SFO Airport, and other airlines and airports. Since CARB's approval of AJF, the business aviation community has also broadly embraced SAF expansion.

The key factor limiting SAF growth, as one might expect with a fuel commodity, is the total monetary value that producers of SAF receive. The total monetary value for SAF encompasses the wholesale price of conventional jet fuel supplemented by the value of policy programs. SAF is disadvantaged at the outset compared to on-road renewable diesel in that conventional jet fuel consistently sells at a discount compared to conventional on-road diesel in the US wholesale market.[7] Both SAF and renewable diesel are also currently disadvantaged by the relatively low fossil fuel prices in the market day due to crude prices that are currently in the $40/barrel range. In addition, SAF is disadvantaged as compared to renewable diesel under federal policy in that SAF receives less RINs per gallon under the Renewable Fuel Standard than renewable diesel. SAF is also disadvantaged from a blending and logistics standpoint in that conventional jet simply flows through the system to airports whereas SAF must be trucked or railed to a terminal for blending and certification. In the current nascent market of SAF, these costs are estimated at 10-20 cents per gallon.

While these factors help explain the market challenges that SAF currently face, the SAF Producer Group is not proposing that CARB attempt to address these fuel market and federal issues in the upcoming LCFS rulemaking.

California's GHG Policy Framework as applied to Conventional Jet Fuel and SAF

Instead, the SAF Producer Group requests that CARB closely examine the policy shortfall that currently exists in the California greenhouse gas (GHG) policy framework itself, and seek to address that shortfall. To be clear from the outset, the SAF Producers are not suggesting that CARB deliberately disadvantaged SAF in designing California's GHG policy framework. Instead, as the following policy discussion makes clear, the disadvantage is a natural consequence of states being preempted from regulating aviation fuel. As a result of preemption,

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Kerosene with Aromatics (FT-SPK/A) (2015 certification, synthesis gas as feedstock); **Annex A5**: Alcohol to Jet Synthetic Paraffinic Kerosene (ATJ-SPK)(certified 2016, ethanol and isobutanol as feedstocks); **Annex A6**: Catalytic Hydrothermolysis Synthesized Kerosene (CH-SK, or CHJ)(certified 2020; fats, oils and greases as feedstock); **Annex A7**: Hydroprocessed Hydrocarbons, Esters and Fatty Acids Synthetic Paraffinic Kerosene (HHC-SPK or HC-HEFA-SPK) (certified 2020; bio-derived hydrocarbons, fatty acid esters and free fatty acids as feedstock). http://www.caafi.org/focus_areas/fuel_qualification.html#approved (last viewed September 17, 2020. See also United States Department of Energy, "Sustainable Aviation Fuel, Review of Technical Pathways," at https://www.energy.gov/sites/prod/files/2020/09/f78/beto-sust-aviation-fuel-sep-2020.pdf (2020).

[6] See e.g. Intelligent Partnership, "Aviation biofuels: which airlines are doing what, with whom?" Blog of June 6, 2020 lists airline activities and links to airline announcements at https://intelligent-partnership.com/aviation-biofuels-which-airlines-are-doing-what-with-whom/. See also National Business Aviation Association, "Work on Sustainable Aviation Fuels Continues Unabated," July/August 2020, at https://nbaa.org/news/business-aviation-insider/2020-july-aug/work-sustainable-aviation-fuels-continues-unabated/

[7] United States Bureau of Transportation Statistics, "Diesel and Jet Fuel Prices," note that chart depicts 20 years of diesel and jet fuel prices with jet fuel always at a discount to diesel fuel ranging from a few cents to full dollar, at https://www.bts.gov/diesel-and-jet-fuel-prices

conventional jet fuel is purposefully excluded from California's Mandatory Greenhouse Gas Emissions Reporting, Cap-and-Trade, and the Low Carbon Fuel Standard.[8] Similarly, the California Sustainable Freight Action Plan does not address aviation fuel and to our knowledge, the only California GHG program that does seek to reduce GHG emissions from aviation fuel is the LCFS.

The specific market consequence of jet fuel being excluding from California's GHG policy framework is that the fossil jet fuel is not receiving the same clear market signals that the fossil on road diesel market is receiving. This is best illustrated by examining California's two most important market-based programs for transportation fuels: Cap-and-Trade and the LCFS.

Under Cap-and-Trade, on-road diesel fuel triggers an allowance obligation when the fuel is sold or transferred over the rack. The obligated party incurs a cost per gallon of diesel fuel received over the rack that is based on the price of the Cap-and-Trade allowances that must be purchased and retired for that fuel. This cost is estimated and reported by a petroleum market service such as the Oil Price Information Service (OPIS), and is typically referred to as the Cap-at-the-Rack Cost. At the beginning of 2020, the Cap-at-the-Rack Cost for diesel has been estimated by OPIS and other sources as in the range of $0.18 per gallon.[9]

While the LCFS has a distinctly different policy structure, it has a similar impact on petroleum market participants. Because the LCFS sets a carbon intensity that is lower than petroleum diesel, market participants that sell only diesel fuel must buy LCFS credits sufficient to meet their obligations. OPIS reports an imputed LCFS cost based on an estimate of how much the LCFS credits required will cost for each gallon of fossil diesel delivered into the California market. For January 2020, the LCFS cost has been estimated by OPIS and other sources in the range of $0.20 per gallon.[10] Because diesel market participants must comply with both the Cap-and-Trade and the LCFS program requirements, the programs together add about $0.40 per gallon to each gallon of on-road diesel sold from a petroleum market participant's perspective. These market participants are therefore increasing their price for selling on-road diesel approximately forty cents per gallon to cover both of these costs.

In contrast, petroleum jet fuel market participants do not add a surcharge to conventional jet fuel to cover the cost of Cap-and-Trade and LCFS compliance costs. As a result, strictly on a California policy basis, petroleum jet fuel is discounted about forty cents per gallon compared to on-road petroleum diesel fuel. For a production facility that must decide whether to produce and sell renewable diesel to the on-road market or SAF to the aviation market, forty cents is a powerful economic motivation to produce and sell into the on-road market. Because SAF companies and airlines recognize the long-term importance of building the aviation market, companies like World Energy and United Airlines have partnered in SAF deals to overcome the economic hurdle the policy disparity presents. However, as is illustrated by the current rate of

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[8] See e.g. Mandatory Reporting Regulation, "Suppliers of Transportation Fuels" provision at 17 CCR §95121(a)(2) stating that emissions reporting is not required for fuel where a use exclusively in aviation can be demonstrated.
[9] OPIS Blog, "Carbon Credit Costs for California Gasoline & Diesel: A Heads Up for US Suppliers," (May 4, 2020), at http://blog.opisnet.com/california-gasoline-carbon-credit-costs
[10] Id.

SAF market growth, California's and the world's SAF expansion goals cannot be met unless this policy disparity is addressed.

Recommended LCFS Regulatory Change

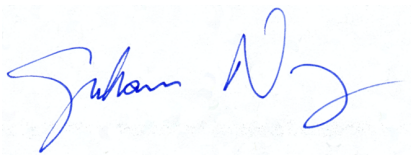
Given that California GHG policy currently disadvantages SAF production, the SAF Producers recommend that CARB revisit Table 3 contained in §95484 of the LCFS, "Benchmarks for Fuels used as a Substitute for Conventional Jet Fuel." Table 3 is unique among the §95484 tables in that it does not set benchmarks for conventional jet fuel. This reflects CARB's recognition that the state is preempted from regulating jet fuel. As a result, the Table 3 benchmarks do not have any regulatory impact except to determine the credit generation for opt-in SAF. This regulatory setting provides CARB with flexibility to set the levels for Table 3 without changing any applicable CI standard.

From a SAF incentive standpoint, the most effective benchmark to drive SAF market expansion would be for CARB to maintain the CI standard at the current plateau of 89.37 gCO2/MJ that is in place for the years 2019-2022. CARB has the authority to maintain the CI level at 89.37 for the years 2024-2030, given that there is no true CI standard for conventional jet fuel as there is for petroleum diesel and gasoline. While the SAF Producer Group would support the plateau approach for these seven years, we recognize that CARB will first want to receive and review significant technical and policy support for the proposed change prior to determining the optimal recalibration of Table 3. We look forward to engaging with CARB and industry stakeholders, and to developing consensus through this process and are therefore are not making a specific Table 3 CI recommendation at this time.

Conclusion

Thank you for your consideration of our input to this LCFS rulemaking informal workshop. We would welcome the opportunity to present this policy concept at the LCFS Policy Workshop on October 15th.

Sincerely,



Graham Noyes