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Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, CA 95814
Via Online Submission: https://ww2.arb.ca.gov/applications/public-comments

Comments on Proposed Low Carbon Fuel Standard Amendments—Second 15-Day Changes

Dear Mr. Botill:

Thank you for the opportunity to provide comments in response to the Low Carbon Fuel Standard (LCFS) proposed modifications (Second 15-Day Changes). We appreciate CARB engaging stakeholders' input on a variety of forward-looking concepts for the future of the LCFS. Taking decisive action to bolster the LCFS market will help ensure the long-term viability of the program and the accomplishment of the state's carbon reduction objectives. SkyNRG Americas ("SkyNRG") is pleased to be able to provide comments on several areas of the Second 15-Day Changes proposal.

SkyNRG has been engaged in enabling sustainable aviation fuel (SAF) as a solution to decarbonize aviation since 2010. Starting in 2019 we initiated the construction of new dedicated SAF production facilities to support the aviation industry's 2050 net-zero commitments with new SAF capacity globally. Critically, SAF is one of the few cost-effective and scalable tools for decarbonizing aviation in the near- to medium-term. As such, SAF is one of few viable solutions for California to mitigate aviation emissions in the foreseeable future.

For our SAF project development efforts in the US, SkyNRG will be among the first producers of SAF and renewable diesel (RD) at-scale sourced from cellulosic feedstocks such as biomethane or renewable natural gas (RNG). SkyNRG's SAF production process is anticipated to use RNG sourced from a variety of sources and secured from common carrier pipelines on a mass balance accounting basis similar to producers of other clean fuels such as compressed natural gas (CNG), or liquid natural gas (LNG) do currently in California. Importantly, SAF produced from RNG also doesn't compete with food-based crops or create indirect land use challenges.

As other industries and transportation sectors decarbonize utilizing electrons and other low carbon fuel sources, aviation as a proportion of California's total greenhouse gas footprint will continue to increase through 2035 and beyond. The aviation sector is one of the most difficult industries to decarbonize (or electrify) due to unique operational and safety requirements that necessitate liquid energy-dense fuels, highlighting the critical role of low-carbon liquid fuels such as SAF for the future of the sector.

SAF is an essential contributor to achieving Governor Newsom's goal of 20% clean fuels for the aviation sector by 2030.[1] However, delaying supportive low carbon policies that enable SAF in the LCFS now will jeopardize the industry's ability to scale SAF production in the timeframe needed to meet the Governor's goal in the future. SAF production facilities can take five to seven years to move from

[1] Governor Newsom Calls for Bold Actions to Move Faster Toward Climate Goals | Governor of California calling for 20% SAF target.

development to operation; consequently, construction of new projects (or expansions of existing facilities) must begin now to enable these solutions to be available by 2030.

SkyNRG submits the following comments related to avoided methane crediting periods and the deliverability trigger for RNG, the addition of sunflower oil to the list of capped virgin crop-based feedstocks, support for increased program ambition for 2025 and beyond, flexibility around mass balance accounting and increased ambition in support of SAF as a solution.

Some Changes to RNG Treatment and Credit Generation Are Problematic; Further Study is Necessary

- *Crediting Periods Allowed for Avoided Methane Needs More Clarification*

SkyNRG is disappointed that CARB plans to reduce the total number of crediting periods for avoided methane emissions for RNG projects built after January 1, 2030, from three to two. This is a very problematic change as both agricultural and organic waste diversion projects are heavily dependent on the LCFS for viability.

CARB should continue to encourage the capture and productive repurposing of methane emissions from organic waste streams processed through anaerobic digestion, regardless of the source of the waste stream or when this waste is produced. To this end, and as noted in previous comments, SkyNRG encourages CARB to avoid making changes that limit opportunities to include avoided emissions in CI calculations. Recognition for this GHG benefit should not simply be ignored particularly when no replacement policy is in place. As noted in previous comments, is unwise and risky to impose an arbitrary phase-out of avoided methane crediting without a detailed plan for developing a supporting replacement policy.

If there are to be limits on credits from the use of avoided methane, the longest possible phase-out period is preferred. The treatment of avoided methane continues to create significant project uncertainty and increases the potential for stranded assets—an issue correctly cited by CARB during prior workshops as a key outcome to be avoided.[2]

If CARB truly wants methane abatement from sources such as agricultural wastes to continue, and for new sources of RNG activity such as organic waste diversion from the municipal waste stream to develop, they must reconvince the clean fuel investment community that RNG will remain a viable and important contributor to the LCFS framework. Therefore, we believe that this warrants further study from CARB to avoid any unnecessary consequences as currently proposed since methane sources will continue to increase in the future.

As SkyNRG continues to build out SAF production capacity in the US, the company will continue to explore a wide range of RNG feedstock opportunities from organic waste streams, including food waste, yard and landscaping waste, industrial and wastewater sludge, and a variety of animal wastes in the coming decades. Many untapped waste streams are novel as it relates to LCFS pathways, but nonetheless can readily be converted to transportation fuels through technologies that are commercially proven and readily suitable for producing low carbon fuels from RNG pathways.

[2] See CARB's Presentation at the February 22, 2023, LCFS Workshop, slide 31. https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/LCFSpresentation_02222023.pdf

The GHG emission reductions resulting from CNG fleets being the default for many medium- and heavy-duty applications are attributed, in part, to the incentives of the LCFS and has resulted in improved air quality for constituents. SAF is at a similar crossroads. By allowing for avoided methane crediting for RNG as a feedstock, CARB has the potential to see SAF become the default fuel for aviation, much like the transition in the CNG fleet space. RNG has continued potential to reduce GHG emissions in California, and recognizing its potential as a feedstock is essential to the continued success of the program.

We encourage CARB to study the success of Europe's Renewable Energy Directive (RED), which has long recognized the avoided methane benefits when assessing the lifecycle CI of various RNG pathways. The RNG to SAF pathway presents a unique opportunity to scale-up low carbon fuels in the aviation sector to align with the Governor's recently stated goal for SAF by 2030.

- *Deliverability trigger creates a barrier to imports and should not be adopted in the LCFS*

The Second 15-Day Package's changes to deliverability requirements are still problematic for RNG development. The new proposal is to trigger the timing of deliverability requirements for RNG to natural gas vehicle pathways based on medium- and heavy-duty zero-emission (ZEV) and near-zero-emission (NZEV) vehicle penetration.

While we understand conceptually that CARB may not want RNG to be used in natural gas vehicles if ZEV penetration goals succeed, the trigger itself is not something that RNG developers are comfortable predicting. Because LCFS crediting requires having an established end use for the RNG (to receive pathway approval and to understand eligibility for federal Renewable Fuel Standard credits), investment in methane reduction cannot be made with much certainty based on this trigger.

Given that California clearly benefits from broad North American and global energy markets for other types of energy—and the recent trend toward significant increases of the California-based supply of RNG,[3] with in-state production increasing from 6.74% in 2021 to 18.23% in 2023—we continue to question why CARB would propose eliminating imported RNG eligibility from any portion of the North American gas system. All RNG projects produce the desired benefits of displacing fossil gas, and most create significant methane reductions. Achieving these benefits should remain the primary focus for California RNG policy.

Support for the Addition of Sunflower Oil to the List of Virgin Crop-Based Feedstocks with Limited Eligibility for Credit Generation from the Production of Biomass-Based Diesel

SkyNRG supports CARB's proposal in the Second 15-Day Changes to add sunflower oil to the list of virgin crop-based feedstocks that are limited in credit generation potential in the production of biomass-based diesel. With this update in the Second 15-Day Changes, virgin sunflower oil joins virgin soybean oil and canola oil in the twenty percent crediting eligibility limitation on virgin crop-based feedstocks used to produce biomass-based diesel.

[3] https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

We agree that these limits will help avoid sending a long-term signal for virgin crop-based feedstocks to serve California demand. Furthermore, we believe that CARB should continue to focus on shifting demand to advanced feedstocks that can bypass the issues that first-generation biofuel feedstocks face. Given that science-based research has shown that food-based biofuels are linked to emissions from deforestation and other indirect land-use change (ILUC), this shift is particularly important.[4] We are however concerned about the addition of alcohol to hydrocarbons to the list as a potential Tier 2 eligible drop-in fuel. This could potentially open up a loophole enabling corn ethanol-based SAF which could skirt the cap on biomass-based diesel. For this reason, we would urge careful consideration of this addition.

In addition to the above comments on updates included in the Second 15-Day Changes, SkyNRG continues to urge consideration of the following comments in the proposed LCFS amendments.

Support for Increased Program Ambition for 2025 and Beyond

We strongly support CARB's intention to increase program ambition for 2025 and beyond. Since its implementation over a decade ago, the LCFS has proven highly successful in both encouraging market investment in low carbon fuels and lowering emissions in the transportation fuel sector. To help ensure a healthy LCFS credit market that can keep pace with these investments, we strongly support CARB's plans to strengthen the existing emission targets for 2030 and beyond. Therefore, we encourage CARB to adopt what was proposed at the November hearing, because the proposed increase in near-term stringency is needed to address near-term oversupply. By making appropriate adjustments, CARB can reflect the strong market supply scenario, thereby fostering the development of additional solutions to further drive down the state's emissions with SAF.

Additionally, we believe CARB should also commit to considering at least a 35% CI reduction by 2030 through a future rulemaking (the ICF analysis shows that a CI reduction of >40% by 2030 is feasible) and that the Auto Acceleration Mechanism should be able to trigger earlier. As a member of the Coalition for Renewable Natural Gas (RNG Coalition), we support their positions on these two topics in their comments on the 15-day amendments.

Expanding, Not Limiting, Mass Balance Accounting of RNG including to SAF and RD

As stated in previous comments to CARB, expanding opportunities for RNG to be used as an input for additional transportation fuels such as SAF and RD will be critical to achieving more stringent targets. Existing LCFS regulations incentivize the use of RNG in renewable CNG and LNG applications by offering the flexibility of mass balance accounting of RNG injected into pipeline systems connected, sometimes at great distance, to downstream production or dispensing locations (sometimes referred to as "book-and-claim"). This is a highly effective way to rapidly decarbonize transportation fuels, and we encourage this to be expanded to SAF and RD as it has been applied to other transportation fuel end uses like CNG, and LNG. Under the current LCFS regulations, SkyNRG (and others) would be unable to participate in the expansion of the program because there are no provisions allowing mass balance accounting for offsite RNG utilized as feedstock to produce SAF and RD.

[4] Tyler J. Lark, Nathan P. Hendricks, Aaron Smith, Nicholas Pates, Seth A. Spawn-Lee, Matthew Bougie, Eric G. Booth, Christopher J. Kucharik, and Holly K. Gibbs, "Environmental Outcomes of the US Renewable Fuel Standard," Proceedings of the National Academy of Sciences 119, no. 9 (March 1, 2022). https://doi.org/10.1073/pnas.2101084119

The U.S. RNG industry has evolved with existing regulatory programs at both the federal and state levels that reasonably recognize that most sources of RNG do not justify co-location of fuel production facilities. To accommodate this challenge, mass balance accounting is an indispensable ingredient to incentivizing the development of RNG resources and unlocking their emission reduction potential to materially reduce emissions.

The U.S. Environmental Protection Agency (EPA) has recognized the potential for RNG as a feedstock in the production of renewable fuels. In its 2023 rulemaking, the EPA established a regulatory framework allowing the use of RNG as a "biointermediate," paving the way for producers like SkyNRG to make renewable, low carbon fuels like SAF and RD from products derived from RNG under mass balance accounting (once finalized). Critically, the EPA's regime leverages indirect accounting of pipeline injection and offtake at separate points consistent with LCFS mass balance accounting procedures. In CARB's ISOR for the proposed rule change, the need to align with federal support for SAF proliferation is specifically highlighted as a guiding principle of the rule change.

The LCFS program has long been compatible with federal incentives, including the Renewable Fuel Standard (RFS) and numerous tax credits. The creation of additional federal incentives through the Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA) only increases the opportunity for the LCFS program to align with and leverage federal investments to accelerate decarbonization. While the SAF market is growing, these incentives are greatly needed and have outsized impacts in supporting the industry's maturation. CARB should ensure that the LCFS program aligns with the treatment of SAF feedstocks under the RFS to avoid creating a bifurcated RNG market. Further, given the intention to align and coordinate LCFS programs in California, Oregon and Washington and further accelerate the uptake of SAF, we also encourage CARB to consider Washington state's approach to enabling book and claim/mass balance accounting for RNG to SAF.

We implore CARB to expand eligibility for mass balance accounting of all sources of RNG as feedstock to produce transportation fuels like SAF and RD. Doing so will create new opportunities to utilize RNG to make low, or even negative, CI transportation fuels that are suitable for sectors that are hard to decarbonize in California, directly contributing to Governor Newsom's ambitious goals for expanded production and use of low carbon, renewable aviation fuels. With appropriate oversight (including the verification and validation procedures CARB already requires), we believe that any compliance risks can be effectively managed as they are today for CNG, LNG, and hydrogen production. By recognizing the potential of RNG as an SAF and RD feedstock, CARB acknowledges its material value to a maturing industry and instills confidence in investment communities to continue to invest in the energy transition of this sector. Limiting mass balance accounting eligibility for RNG feedstocks is a critical issue that may significantly negate California's ability to benefit from the next generation of low-carbon fuels.

Greater Support for Near-Term Aviation Solutions Particularly SAF

SkyNRG sees sustainable aviation fuel as one of the few near-term, readily available solutions to addressing both carbon dioxide (CO2) and non-CO2 emissions from aviation. For this reason, we remain disappointed by the recent proposal to maintain the LCFS fossil jet fuel exemption.

Achieving California's ambitious goals for the aviation sector will require addressing the structural disincentives for SAF embedded in the status quo. While SAF is eligible to receive credits under the

LCFS,[5] the lack of deficits on the fossil jet fuel side decreases the value of SAF as a replacement relative to renewable diesel, which replaces an obligated and therefore more costly fossil fuel. This structural disparity, illustrated by multiple third-party analyses, strongly and systematically incentivizes clean fuel producers to make renewable diesel rather than SAF.[6] The result: in 2023, 2 billion gallons of renewable diesel were registered by the program but only 23 million gallons of SAF.[7] It remains unclear what differences exist between aviation and on-road fuels that justify continuation of uneven supportive policies.

For most low-carbon alternative fuels, production remains more expensive than the incumbent fossil alternative. Fundamentally, not obligating traditional fossil fuels ensures that they remain inexpensive relative to low carbon alternatives. Rational fuel users will choose the less expensive option, and even fuel users who want to advance low carbon options will be undercut. This puts a strong chilling effect on the rate of adoption of opt-in fuels.

To ensure that CARB's current proposal does not exacerbate structural disincentives to SAF under the LCFS program, we suggest a modest step that would remove the applicability of the Auto Acceleration Mechanism (AAM) to the table of annual jet fuel benchmarks. The AAM applied to the gasoline and diesel benchmarks can act to control the credit supply by both reducing credit generation for alternative fuels and increasing deficits for fossil fuels. However, without any obligations on fossil jet fuel, the AAM would only undercut support for SAF without creating any corresponding demand.

In conjunction, we propose that CARB set the jet fuel benchmarks at a level and on a schedule that recognizes that SAF is an emerging, less mature market that has not benefited from higher fossil benchmarks and years of credit generation since program inception in 2010. In the early years of the LCFS program, CARB set small CI reduction targets for gasoline and diesel and modest annual increases to allow the industry (both fossil and alternative) time to complete their investments and ramp up production. CARB can evaluate the jet fuel benchmarks and set them in such a way that supports SAF as an emerging fuel and addresses airline industry concerns about the transition towards increasing low-carbon fuel use. This could include freezing the jet fuel benchmarks, resetting the 2030 jet fuel benchmark targets to their pre-amendment level of 20%, or decoupling the annual increases of the jet fuel benchmarks from those of gasoline or diesel. Notably, British Columbia has adopted a similar approach under their recent LCFS amendments, providing both a higher benchmark and a less aggressive compliance curve for aviation fuels, preserving credit generation opportunities for the emerging SAF industry.

Further study of the local air quality conditions surrounding California's major airports and the benefit of SAF use to these communities is also recommended. This presents an opportunity for collaboration with the aviation sector and airport workers to support the accelerated uptake of currently available solutions like SAF to help mitigate both health and climate impacts in the near- and long-term.

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[5] We applaud CARB's harmonization of the annual CI standards for diesel and jet fuel following the 2018 Rulemaking. This preserves credit generation opportunities for SAF and reduces some of the structural differences that would otherwise disincentivize SAF production compared to diesel, though significant disincentives remain.

[6] See Bay Area Air Quality Management District (BAAQMD), Sustainable Aviation Fuel: Greenhouse Gas Reductions from Bay Area Commercial Aircraft. October 2020. Page 56 available at https://www.baaqmd.gov/news-and-events/page-resources/2020-news/121120-saf-report. See also https://stillwaterassociates.com/saf-in-the-ira-era-how-do-the-incentives-stack-up/.

[7] CARB Data Dashboard available at https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

After virtually attending the April workshop, we were moved by the testimony and diverse perspectives of airport workers, as represented by the Service Employees International Union (SEIU) and their support for clean fuels such as SAF. While air travel remains crucial in our society, we encourage CARB staff to develop policy that drives uptake of SAF that contributes to protecting the health and safety of these workers and airport communities. Fully addressing aviation's impacts requires a committed approach to reducing CO2 and non-CO2 emissions from aviation and there is a growing body of data that SAF offers this in both cases. [8]

Thank you for the opportunity to comment on the latest set of proposed changes to the LCFS. SkyNRG applauds California's leadership and CARB staff for taking action to drive innovation and growth of low-carbon fuel technologies and we look forward to the successful conclusion of the LCFS rulemaking.

Sincerely,

John Plaza
President & CEO
SkyNRG Americas, Inc.

[8] https://www.dlr.de/en/vt/research-transfer/faq/faq-sustainable-aviation-fuels
https://www.manchester.ac.uk/discover/news/using-sustainable-aviation-fuels-could-reduce-emissions-by-up-to-80-scientists-find/
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