May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814
Via Online Submission: https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024

Comments on April 10 LCFS Workshop

Dear California Air Resources Board (CARB) Low Carbon Fuel Standard Program Staff:

Thank you for the opportunity to provide comments in response to the Low Carbon Fuel Standard (LCFS) workshop on April 10, 2024. We appreciate CARB hosting workshops and 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 LCFS policy.

SkyNRG has been engaged in enabling sustainable aviation fuel (SAF) as a solution to decarbonize aviation since 2009. 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 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 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. 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 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 the air quality benefits of SAF, the auto adjustment mechanism, one time step adjustments and the importance of flexibility around the mass balance accounting of RNG for the production of SAF.

Air Quality Opportunities from SAF

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 commend CARB staff for recognizing more needs to be done to protect the health and safety of these workers and airport communities. Fully addressing aviation's impacts requires a committed approach to reducing both carbon dioxide (CO2) and non-CO2 emissions and there is a growing body of data that SAF offers this in both cases.

While research is ongoing, it is clear that SAF not only releases less CO2 during combustion, but also releases up to 80% less soot into the atmosphere as compared to conventional jet fuel (kerosene).[1] Recent findings from research by the University of Manchester in the United Kingdom have found that emissions from the combustion of sustainable aviation fuels, as compared to fossil jet fuel, reveal a profound reduction in these emissions. Ultrafine black carbon at low thrust, which directly impacts local air quality, was 45% less in number and 80% less in mass for every kilogram of blended sustainable aviation fuel burnt.[2]

In 2022, the Dutch National Institute for Public Health and the Environment (RIVM) released a report on the health effects of long-term exposure to ultrafine particles (smaller than 0.1 micrometer) from air traffic around the Amsterdam Schiphol Airport.[3] Specifically, RIVM examines the effects that air traffic has on, *inter alia*, the cardiovascular system, respiratory tract, and nervous system, as well as general health and mortality. Although further study is required to fully understand the long-term health effects, there is a clear correlation between air traffic and the worsening of pre-existing conditions such as asthma as well as an increased potential for cardiovascular disease, which, according to the World Health Organization (WHO), is the leading cause of death globally.[4]

As CARB considers further changes to the LCFS, we encourage more study of the local air quality conditions surrounding California's major airports and the benefit of SAF use to these communities. 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.

2025 Stepdown Scenarios

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

[1] https://www.dlr.de/en/vt/research-transfer/faq/faq-sustainable-aviation-fuels
[2] https://www.manchester.ac.uk/discover/news/using-sustainable-aviation-fuels-could-reduce-emissions-by-up-to-80-scientists-find/
[3] https://open.overheid.nl/documenten/ronl-af341f669119e9edbbd2a6ed78f68a7eaa7c9fae/pdf.
[4] https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1.

CARB's plans to strengthen the existing emission targets for 2030 and beyond. Therefore, we encourage CARB to adopt the 9% near-term stepdown presented during the April workshop, thereby recognizing the carbon intensity (CI) reduction successes of the program over the previous years. This aligns with the findings of the consulting firm ICF, which suggests an optimal stepdown range of 10.5% to 11.5% for 2025 and targeting a credit bank size equivalent to two quarters worth of deficits. 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.

Auto-Acceleration Mechanism

We also are strongly supportive of the introduction of an auto-acceleration mechanism (AAM) to strengthen CI reduction targets and respond to growth in the low carbon fuels sector. By recognizing and rewarding overperformance in the program, California benefits from the latest growth and expansion of low carbon fuel technologies. Therefore, it is essential the AAM functions properly in tandem with the CI adjustment. Private industry has signaled its readiness to exceed stated goals well ahead of schedule, as evidenced by the achievement of 2026 goals ahead of schedule in 2023 and significant credit bank builds each quarter. Consequentially, we believe the AAM should not be restricted to an every-other-year frequency and adopt an annual review basis. This enables the AAM to promptly respond to the emerging market rather than potentially being two years behind schedule.

Additionally, we support triggering the AAM no later than 2026 and at a lower trigger level. This will guard against the case where the near-term target stepdown is not sufficient to address the current oversupply. The AAM mechanism should be triggered when the credit bank is two times greater than quarterly deficits. If the AAM conditions are met, the corrective mechanism should be able to trigger as soon as possible (i.e., using the 2025 data).

As the private sector continues to develop new low CI fuels, stringent and attainable targets ensure California as a desirable market for these fuels, thereby continuing a legacy of the state's leadership in transforming fuel supply and reducing greenhouse gas (GHG) emissions. Therefore, it is essential to properly adjust the CI targets to give the AAM the best chances of functioning as intended and to continue to showcase California as a leader in the energy transition.

Expanding Not Limiting Mass Balance Accounting of RNG

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. The share of LCFS credits generated for RNG-based fuel, primarily renewable CNG, has steadily grown over the last decade thanks in large measure to the ultra-low CI scores attainable for feedstocks such as dairy and livestock wastes. This trend may be unsustainable long-term, however, if RNG opportunities are not encouraged beyond their current applications due to the limited scale of on-road heavy duty natural gas vehicle (NGV) fleets.

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.

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.

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. We are discouraged that CARB introduced deliverability requirements for RNG that restrict the ability to utilize this low carbon feedstock, rather than expanding its applicability. Geographic and deliverability limitations would almost certainly stifle investment in RNG resources and reduce opportunities for the state to achieve its LCFS-specific climate goals. Respectfully, we believe that CARB's stated goal should be to harmonize mass balance accounting policies for low CI electricity and RNG. This current approach overlooks the fundamental difference of RNG as a feedstock and its application in novel technologies such as SAF, potentially inhibiting its growth. Additionally, as noted in our previous comments, we take issue with the approach of applying the Renewables Portfolio Standard (RPS) deliverability requirements that are specific to electricity generation as they are not fit for purpose for RNG as a transportation fuel or feedstock.

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 accounting for RNG to SAF.

In summary, 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 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.

Further Study on Changes to Avoided Methane Emissions Credits is Necessary

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.

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 in the present amendments that limit opportunities to include avoided emissions in CI calculations. We do not believe that a premature sunset is appropriate in achieving LCFS success as these sources of methane emissions are directly tied to population growth and expanded food production. 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.

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 California's recently stated goals of obligating jet fuel within the LCFS.

Thank you for the opportunity to comment on the 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. Through careful consideration of the impact of these rule change to a developing industry, we believe SAF can help take the LCFS to new heights.

Sincerely,

John Plaza
President & CEO
SkyNRG Americas, Inc.