

October 16, 2024

The Honorable Liane Randolph, Chair State of California Air Resources Board 1001 I Street Sacramento, CA 95814

Electronic submittal: https://ww2.arb.ca.gov/lispub/comm/bclist.php

RE: Comments to the California Air Resources Board on Proposed Modifications (Second 15-Day Changes) to the proposed Low Carbon Fuel Standard (LCFS) Amendments

The Green Hydrogen Coalition ('GHC') is appreciative of the California Air Resources Board's (CARB) Low Carbon Fuel Standard Amendments (LCFS). The GHC is a California educational 501(c)(3) non-profit organization that was formed in 2019 to recognize the game-changing potential of "green hydrogen" to accelerate multi-sector decarbonization and combat climate change. The GHC's mission is to facilitate policies and practices that advance green hydrogen production and use across all sectors of the economy to accelerate a carbon-free energy future and a just energy transition.

The GHC appreciates CARB's leadership in advancing clean fuels via the LCFS program. This program is widely considered one of the most successful programs in North America in achieving the deployment of lower carbon fuels and applauds CARB staff for their thoughtful and forward-thinking proposed modifications to the LCFS. The GHC respectfully submits the following comments to CARB.

GHC recommends strengthening demand and supply signals for alternative fuels – including allowing incentives for renewable H2 as an input for other transportation (non-road) fuels.

In the consideration of alternative fuels, specifically non-fossil fuels, CARB should focus on developing strong supply and demand signals as it lays out its regulations. This should be a key driver for the design of the LFCS, rather than compartmentalizing fuels into specific usage categories. Namely, under the current proposed rules there is a prioritization on renewable hydrogen used as a finished fuel for road transportation within the LCFS, and not for renewable hydrogen used in the production of other low carbon fuels. Hydrogen can serve as a direct fuel and is an essential renewable energy input for other liquid transportation fuels, including but not limited to renewable ammonia, e-methanol, renewable diesel, or sustainable aviation fuel. These fuels

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are critically important to deeply decarbonize hard to abate sectors including some of the most hard to decarbonize sectors within the transportation sector such as maritime shipping and aviation. A key barrier to the use of renewable hydrogen for on road applications and for the production of these derivative fuels is its cost compared to status quo fossil fuels. Market signals that will encourage the scaling of renewable hydrogen production will drive down costs for all uses, on road and off road and even hard to abate sectors. The sooner we can scale the production of renewable hydrogen for all transportation end uses, the faster we can achieve our clean energy transition.

In the near term, the available supply of renewable hydrogen will be relatively low compared to the current availability of fossil derived hydrogen. A key problem that CARB and the broader renewable hydrogen economy needs to solve for is instituting the right signals to grow the supply and help ensure that the supply is available to sectors that are being prioritized in other complementary policies (i.e. Advanced Clean Fleets and Advanced Clean Trucks). There are two paths to consider: one in which the LCFS simply prioritizes directing the limited amount of renewable hydrogen to onroad use and a second one that prioritizes scaling the amount of renewable hydrogen produced in California without restricting or directing the final use.

It is worth noting that a ready and available supply of electrons on our grid is enabling the growth in adoption of battery electric vehicles that use substantially more electricity relative to an average household. Except for very large charging operations (at the multi-megawatt scale), it is relatively easy to utilize the grid to power battery electric vehicles throughout California without a need to prioritize electrons for on-road use. Similarly, if California can create the underlying infrastructure that can deliver copious amounts of renewable hydrogen to generate ammonia, e-methanol, renewable diesel, or sustainable aviation fuel, it will help guarantee a much larger supply of the resource (and have a much lower-cost given economies of scale that will be achieved). In other words, if the LCFS were to help catalyze the development of alternative renewable fuels which represents a significant potential near term off take, this would help drive needed scaled demand for renewable hydrogen and facilitate the scaling of renewable hydrogen production, transport and storage facilities, accelerating cost reduction and ultimately creating a virtuous cycle for faster on-road adoption of renewable hydrogen as a direct fuel as well. By not restricting final use of the hydrogen, California can also unlock its vast renewable potential to produce renewable hydrogen at scale and be able to achieve economywide deep decarbonization much faster.

Accordingly, the GHC requests that CARB include additional direction to support the market demand and supply for hydrogen as a part of its Board Resolution adopting LCFS amendments. Specifically, GHC requests the Board Resolution require CARB staff to develop additional demand signals to enable the development of lowest-cost hydrogen for the transportation market, including

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incentives to utilize renewable hydrogen as an input to transportation fuels for the maritime and aviation sectors.

The GHC Supports Making Fossil Gas Ineligible as a Feedstock for Credit Generation as of 2035 instead of 2030

Per the proposed changes, fossil gas used as feedstock for the production of hydrogen is ineligible for LCFS credit generation starting in 2035, a change from 2030. The GHC supports the need to accelerate the growth of the renewable hydrogen industry in California to replace fossil-based hydrogen over time, but there are investments that need to happen today by the incumbent industry as they transition away from fossil to renewable resources. There are many pathways to produce renewable hydrogen, including SMR of biogas and ideally SMR of biogas with carbon sequestration. Today, CCS on any SMR process is still relatively new and will likely be first developed on fossil gas. Allowing a longer runway for fossil gas will help stimulate needed investment by the oil and gas industry to improve and perfect CCS with SMR. This also aligns with two other policies that CARB is prioritizing, namely:

- CARB is moving away from combustion uses to non-combustion uses. The Advanced Clean Fleets Rule has set 2035 as the deadline for fleets to transition away from combustion and towards ZEV.
- Within LCFS CARB is also moving to disincentivize combustion of RNG and instead encourage RNG use for producing renewable hydrogen. GHC supports this direction. Biogas that is combusted in heavy duty applications will ideally have a new use -- conversion to renewable hydrogen to be used in those same or similar applications, and ideally with CCUS.

GHC supports Expansion of Book and Claim for Low-CI Power Beyond Electrolytic Pathways to Also Include Biomass and Biogas Pathways to Produce Renewable and Low Carbon Hydrogen.

The application of book and claim for the sourcing of low-CI energy used to run processes in the production of renewable hydrogen should apply to all renewable pathways. We are supportive of this change in the final 15 –day proposed changes. Allowing for the sourcing of low-CI power is essential in achieving ultra low and negative carbon intensities that will accelerate achieving the programs goals. Additionally, this is a good demand signal for the renewable energy space that will need to grow and deploy renewable resources to fulfill the needs in this sector.





GHC supports the 3-month matching period for low CI electricity and within 3 years construction to meet additionality requirements.

The Second 15-day proposed changes modify the indirect accounting approach (book-and-claim approach) with respect to low carbon intensity (CI) energy. This change requires a 3-month matching period for the claiming of low-CI electricity and 3 years additionality of the resource within the local balancing authority or consistent with PUC 399.16. Reducing the matching requirement, but maintaining flexibility with a 3-month matching approach, is the right balance to begin addressing some of the seasonal shortcomings in renewable energy generation for the grid while ensuring that the growing renewable hydrogen industry in California can create demand for more renewable power to come online.

GHC supports establishing a bold goal requiring 80% of hydrogen fuel dispensed at fueling stations for all on road vehicles to be renewable by 2030.

Even though GHC has supported parity for H2 fueled vehicles and battery electric EVs in the past, GHC welcomes greater leadership for more ambitious renewable hydrogen targets generally. Bold renewable targets will stimulate market demand for renewable hydrogen and provide needed certainty for producers. As we have discussed previously in this letter, scale is key to achieving these goals, and setting more ambitious renewable targets will provide a needed market signal to scale production.

GHC supports inclusion of Linear Generators as a non-combustion technology

GHC recommends inclusion of linear generators, in addition to fuel cells. Like fuel cells, linear generators can provide non-combustion conversion of a variety of renewable fuels and gases – biomethane, biogas, renewable ammonia or hydrogen – to electricity with virtually no emissions. Linear generators using renewable fuels are now RPS eligible pursuant to AB 1921 (Pappan, 2024) and should be included in the LCFS as well.

GHC specifically recommends that the Air Board add linear generators to the two sections that specifically mention fuel cells or to replace the term "fuel cells" with "non-combustion conversion technologies such as fuel cells or linear generators." This change should be made to the two sections below and anywhere else that lists fuel cells as an eligible technology.

A. 95488.8(i)(2) - "staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell, **linear generator**, or other non-combustion technology."

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B. 95488.9(b) - "staff proposes to add a new temporary CI for low-CI electricity produced by fuel cell **or linear generator** from biomethane from dairy and swine manure, based on existing program data."

Thank you for the opportunity to provide comments on this important program for our energy transition. We look forward to getting to work on implementation and progress to meet our shared goal of decarbonizing the transportation sector.

Sincerely,

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Janice Lin GHC Founder and President

