

February 20, 2024

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

(Comment submitted electronically)

RE: The Importance to California's Climate Goals of Enabling Power-to-Liquid Fuel Producers to Source Low-Carbon Intensity Electricity via Book-and-Claim Accounting

Dear Chair Randolph,

The signatories of this letter are pleased to submit comments recommending a modification to the California Air Resources Board's ("CARB") proposed amendments to the Low Carbon Fuel Standard ("LCFS"). We support CARB's LCFS program, as it sends a market signal to decarbonize the transportation sector, is performance based, and provides long-term policy stability that supports investment. However, we respectfully request that CARB maintain LCFS policy stability for the clean fuels industry and preserve the eligibility of facilities that produce Power-to-Liquid ("PtL") fuels to source low-carbon intensity electricity ("Low-CI Electricity") via book-and-claim accounting. PtL fuels, also known as eFuels, electrofuels or synthetic fuels, are drop-in replacement fuels for use in airplanes, ships and motor vehicles that do not trigger the costs or delays inherent to engine or infrastructure changes. Specifically, we request that CARB preserve the current renewable energy certificate ("REC") system for electrolytic hydrogen and enable the sourcing of energy for PtL fuel production via book-and-claim accounting.

CARB's proposed LCFS regulatory amendments are highly damaging to the nascent PtL industry in that the new proposed regulatory structure would require that PtL facilities source grid mix power both for PtL hydrogen and for their other energy needs. This structure would inhibit the growth of PtL fuels and the expansion of new sources of renewable power. One of the key benefits of PtL fuels is their deep reduction in carbon intensity (over 90%) compared to fossil fuel incumbents. The deep CI reduction hinges on reliance on carbon-free electricity. CARB's LCFS regulations, if they fail to allow book-and-claim mechanisms for PtL fuel producers' electricity procurement, will undercut the tremendous potential of PtL fuels to contribute to the decarbonization of internal combustion vehicles ("ICVs") and, importantly, the aviation sector. Indeed, the proposed LCFS regulatory change impedes fulfillment of the goals of CARB's 2022 Scoping Plan to dramatically decarbonize transport and power and reduces the likelihood that California will achieve its goal to displace 80% of its fossil jet fuel supply with sustainable aviation fuel ("SAF"). It also makes it very challenging to achieve the on-road and jet fuel CI reduction target of 90% by 2045 that CARB has proposed.

PtL has the potential to be an ultra-low carbon fuel alternative to petroleum derived transportation fuels and to scale rapidly - ***but only to the extent that PtL producers are allowed to source Low-CI Electricity***. PtL fuel producers do not use biomass feedstocks for production

but instead utilize carbon dioxide (CO₂) that would otherwise be emitted as waste and water as their only feedstocks to produce PtL transportation fuels. To convert water to hydrogen via electrolysis, PtL facilities require a substantial amount of power, which needs to come from carbon-free sources in order for the resulting fuels to achieve deep CI reductions. Due to this electricity demand, the proposed regulatory changes would dramatically increase the CI of PtL fuels (i.e., to a level at or above the petroleum baseline CI value) and perpetuate the use of fossil jet fuel and other petroleum-based fuels in the broader transportation sector. This will effectively stunt the innovative PtL industry, the importance of which has already been recognized in the road, aviation and maritime sectors and in other jurisdictions such as the European Union and United Kingdom (i.e. ReFuelEU Aviation, FuelEU Maritime, EU RED, and UK RTFO programs).

CARB's Proposed Change to the Existing LCFS Regulation Is Highly Detrimental to PtL Fuels

Under §95488.8(i)(1)(A)-(B) of the existing LCFS Regulation, book-and-claim accounting is authorized for Low-CI Electricity supplied as a transportation fuel or to produce hydrogen through electrolysis if that hydrogen is used either as a transportation fuel or in the production of another transportation fuel (e.g., SAF). Through these provisions, PtL facilities are explicitly authorized to source Low-CI Electricity from the grid to produce hydrogen that is used in the production of PtL fuels. Under these existing LCFS provisions, Low-CI electricity can be sourced flexibly through the use of RECs or via a qualifying Green Tariff program.

The proposed LCFS regulatory revisions that CARB released on December 22, 2023, would dramatically narrow the power-sourcing landscape for PtL producers. The proposed amendments would revoke the current authorization to source Low-CI Electricity for electrolysis through the REC mechanism. To source Low-CI Electricity, the proposed regulations would instead require a PtL facility to construct a wind, solar or other renewable generation project and directly connect that power generation source behind the utility meter to the PtL fuel facility, which is typically impractical. CARB's regulatory proposal will severely inhibit the growth of a liquid fuel technology that holds great promise for scaling and, as noted above, is not dependent upon biomass feedstocks. By changing its policy this significantly with no notice to the industry or delayed phase-in, CARB will also undermine investor confidence in the continuity of its policy structure and thereby deter investment in *all clean fuel facilities and technologies*, including game-changing fuels like PtL fuels.

Policy Support for Expanding Power Sourcing Flexibility within the LCFS

We appreciate that other considerations have informed CARB's development of the proposed LCFS amendments. In particular, we recognize that CARB is seeking to adhere to a strategy of aggressive electrification to reduce GHG emissions from the transportation sector and is seeking to support the growth of hydrogen fuel cell electric vehicles (FCEVs) through this regulatory proposal. By this comment letter, we do not seek to detract from CARB's electrification strategies and for the reasons discussed herein, we consider our proposed revision to the proposed LCFS amendments to be fully consistent with these strategies. However, we do think it important to bring to CARB's attention the difficulty of decarbonizing the aviation sector without enabling PtL fuel producers to access Low-CI Electricity via the grid. It is only through

the ability to source zero-emission electricity from renewable energy resources that PtL facilities will be able to obtain ultra-low CI scores (e.g., < 10 gCO_{2e}/MJ) for their fuels, substantially reduce GHG emissions on a lifecycle basis and generate LCFS credits.

This past November, The International Council on Clean Transportation (“ICCT”) published a white paper assessing the feasibility of meeting the targets in the Biden Administration’s SAF Grand Challenge based on “resource availability, production costs, technology readiness level, and policy support.”¹ ICCT’s white paper emphasized the importance of PtL SAF in meeting the 2050 SAF Grand Challenge goal of 35 billion gallons, as follows:

We find that the near-term 2030 production target can be met with sustainable resources, but the 2050 target will be far more challenging to reach. In the longer-term, biomass volumes will need to be supplemented with a combination of other fuel sources or fuel burn reduction to meet the energy needs of the entire U.S. aviation sector. . . .

E-fuels, or synthetic aviation fuels produced from renewable electricity, could help to bridge the supply gap in later years. . . . Though the technology remains in the demonstration phase, e-fuels have gained significant interest in Europe and other markets due to their ‘drop-in’ advantages and theoretically unlimited supply. For example, the EU has adopted an e-fuel mandate of 1.2% of aviation fuel, averaged over 2030 and 2031, and 5% of aviation fuel volumes by 2035 (European Commission, 2023). These e-fuels are estimated to be costlier than most biomass-derived SAFs in the near-future, but their costs could rapidly come down as electrolyzer technology matures and the cost of renewable electricity declines (Zhou et al., 2022). . . . With the use of policy incentives, including the IRA’s 10-year production tax credits for hydrogen and carbon capture, utilization, and storage (CCUS), e-fuels will likely become cost-competitive within a much shorter timeframe.²

Conclusion

Due to the importance of Low-CI Electricity to the production of PtL fuels, and the importance of PtL fuels to meeting both California’s 2045 carbon neutrality goal and California’s specific goals to displace fossil jet fuel with SAF, we respectfully recommend that CARB modify the proposed LCFS amendments such that PtL facilities are authorized to procure Low-CI Electricity for electrolytic hydrogen production and their other energy needs via book-and-claim accounting.

Thank you for the opportunity to provide comments on this important topic.

¹ O’Malley, J., Pavlenko, N., & Kim, Y.H. (2023). Meeting the SAF Grand Challenge: Current and Future Measures to Increase U.S. Sustainable Aviation Fuel Production Capacity. International Council on Clean Transportation. Available at <https://theicct.org/wp-content/uploads/2023/11/ID-37-%E2%80%93SAF-Grand-Challenge-white-paper-letter-40036-v3.pdf>.

² *Id.* at 21.

Sincerely,

