



Hydrogen Means Business in California!

December 21, 2022

Dr. Cheryl Laskowski
California Air Resources Board
1001 I Street Sacramento, CA 95812

Dear Dr. Laskowski,

On behalf of the undersigned organizations and companies, we are pleased to submit the following comments for consideration as the California Air Resources Board (CARB) develops updates to the Low Carbon Fuel Standard (LCFS). We appreciate the opportunity to comment on the November 9, 2022, workshop regarding the California Transportation Supply (CATS) optimization model and LCFS policy assumptions for scenario development.

In this letter we will discuss:

- Limited options within the proposed scenarios
- Additions of biomass from wildfire management, agriculture waste, and municipal biomass to the feedstock supply curves
- Opposition to phasing down avoided methane or geographic restrictions of biomethane
- Support for 10% of deficits for the infrastructure crediting pool

Open and Transparent Modeling

We support transparent modeling which allows stakeholders access to run alternative scenarios or challenge all the assumptions within the CATS model. CARB should avoid limiting modeling to three scenarios and a baseline as this presents a limited view of options. To optimize innovation and creativity of the marketplace we support an open-source approach to modeling that allows individuals, academic institutions, and compliance entities to examine the assumptions and offer full review of the model. We support an approach to CATS like how the CPUC allows stakeholders to work with the RESOLVE model. This open-source approach led to the discovery that biofuels were “turned off”¹ in the reference scenarios for Integrated Resource Planning (IRP). We believe full transparency will underscore the integrity of the model and policy decisions throughout this proceeding.

Feedstock Supply Curves

We believe the CATS model should include biomass feedstocks like forest residues, agricultural waste, and municipal organic waste streams. The Scoping Plan indicates the need to mitigate emissions from

¹ Reed, Jeffery. [The Potential Impact of Renewable Gaseous Fuel on Optimizing the California Renewable Portfolio, RESOLVE Model Scenario Analysis](#)

these waste streams. Several hydrogen production pathways will serve an important role in reducing the climate and air quality impacts of the pollution associated with these waste feedstocks. A study produced by Livermore Laboratory Foundation and the ClimateWorks Foundation states, “[w]aste biomass is widely available across California, with about 56 million bone dry tons per year available from trash, agricultural waste, sewage and manure, logging, and fire prevention activities.²” Furthermore, “[c]onverting this biomass into fuels with simultaneous capture of the process CO2 emissions holds the greatest potential for negative emissions in the State.³” As such, we urge CARB staff to include biomass feedstocks in the CATS model and the broad array of processing options for conversion to fuel including digestion and pyrolysis.

Biomethane Crediting

California’s LCFS is having national impacts on mitigation of the short-lived climate pollutant methane but also in motivating other jurisdictions to adopt similar programs to extend these benefits across the nation. This national leadership will be undermined with the proposed assumptions for Alternative A and Alternative B on avoided methane crediting and Book & Claim (B&C).

Diminishing LCFS renewable natural gas (RNG) incentives would slow clean fuel progress and increase methane emissions. The sudden removal of LCFS incentives (e.g., for “non-West” projects) will cause existing digesters to shut down and prohibit any further investment in carbon mitigation strategies outside of California. This in turn will damage California’s leadership role on expanding climate changes policies beyond our border and might suspend pursuit of LCFS programs in other states.

B&C matches RNG development to the realities of the gas system. Gas is a fungible commodity in North America. There is no reason to track specific molecules from source to sink. Furthermore, B&C is being expanded in Europe to increase the pace of GHG abatement from RNG, recognizing the need for stable regional energy systems.

Avoided methane crediting is working for dairy digesters and could work better for organic diversion. Digesters with productive energy generation have been proven to be the best system for manure methane emission controls for many farms across the country. The costs have been studied by California for over 20 years, and by US EPA for over 25 years. The real proof is that only recently has the mix of federal and state incentives been successful at promoting significant investment in methane reductions from digester project development (especially in CA). Current CA LCFS pricing already faces a big headwind for continued investment. Avoided methane crediting should only be stopped if there is a federal requirement to control methane from these sources, otherwise these projects provide additionality to California’s program. Additionally, avoided methane crediting for organic waste digestion should be expanded to achieve SB 1383 goals.

Furthermore, as CARB’s Uncertainty Analysis for the Scoping Plan indicates, permitting is a prominent risk for biomethane and organic waste diversion and meeting California’s carbon neutrality goals.⁴ These out-of-state facilities are available today while we site, permit, and build facilities in California. While we agree that it is imperative to scale up facilities in California, we are uncertain whether the timelines proposed in the workshop align with the statewide demand or the global benefit of having a LCFS that

² Baker, Sarah E., et. al., [Getting to Neutral](#), pg. 21

³ Ibid, pg. 21

⁴ 2022 Scoping Plan, [Appendix J, Uncertainty Analysis](#), pg. 2-3

reaches beyond California's border. We would like to continue working with CARB and RNG producers to figure out ways to accelerate permitting, construction, and distribution of the facilities necessary to meet or exceed California's short-lived climate pollutant goals. The hydrogen community can help as an off-taker and we recognize the absolute need to mitigate as much biogenic methane as possible, in California and throughout the United States, to avoid the risks of climate change. For these reasons we believe CARB should not abandon RNG as a working tool driving major reductions in a critical short lived climate pollutant.

Support 10% of Deficits for Refueling Infrastructure

As noted in our previous letters we support use of 10% of deficits, equally distributed between hydrogen refueling and fast charging – light-duty (LD) and heavy-duty (HD), for infrastructure credits. Based on our modeling this is critical for the success of both Advanced Clean Cars II and the Advanced Clean Fleets rulemaking. Hydrogen refueling receives limited support from our ZEV programs and HRI has been a critical complement in the early deployment of stations. We believe extension of the 2.5% LD credits and expansion for a 2.5% HD hydrogen infrastructure credits will allow stations to precede vehicles into the later part of this decade when vehicle deployments ramp up with the support of a statewide refueling network thus enabling future off-take of low to zero-carbon hydrogen at the scale necessary to achieve our LCFS targets, Advanced Clean Cars II, Advanced Clean Trucks, and Advanced Clean Fleets goals.

Additional Considerations:

Renewable Process Energy for Hydrogen Production and Processing

We support allowing process energy used in hydrogen production to use power-purchase agreements for low-carbon energy to be credited within pathways like production feedstocks.

Per the current regulation: § 95488.8. *Fuel Pathway Application Requirements Applying to All Classifications*

(h) Renewable or Low-CI Process Energy. Unless expressly provided elsewhere in this sub article, indirect accounting mechanisms for renewable or low-CI process energy, such as the use of renewable energy certificates, cannot be used to reduce CI. To qualify as a low-CI process energy source, energy from that source must be directly consumed in the production process as described in (1) and (2) below:

To provide equal benefit to fuels, we recommend that the use of renewable energy credits (RECs) qualify for all fuel pathways in both feedstock and process energy applications.

By allowing RECs to be used for feedstocks but not for process energy, the regulation significantly limits the potential to have the lowest possible CI fuels for consumers. This disproportionately affects hydrogen supply as the contribution to CI of process energy in the forms of compression, refrigeration, liquefaction, pumping, and distribution is significantly higher than for other fuel options.

To address concerns about traceability, tracking, and reporting of these RECs across different regions, we would suggest that a certified third-party validation process be invoked to hold the reporting entities accountable for their pathway compliance.

Hydrogen Book and Claim

We support allowing B&C for hydrogen when it is supplied from mixed supply schemes such as networks connecting multiple production sources or bulk gaseous/liquid storage.

ARB staff has advised that the use of B&C or equivalent methods to capture renewable energy credits in a fuel pathway is not allowed as it has not been explicitly indicated in the current regulation.

We are recommending that book-and-claim accounting be allowed under the current regulations in a manner that is technology neutral and designed to accommodate novel hydrogen production pathways. By not allowing for such accounting methods, hydrogen suppliers are unable to provide the lowest possible CI fuels when the production, storage, or distribution of fuels involves mixed production supply schemes.

Example 1: A likely hydrogen supply scenario can have multiple production sources feeding into a single liquefier and or bulk storage system (vessels, tanks, or caverns). Without allowing for this book-and-claim scenario, when hydrogen from such a facility is distributed to a fuel retailer, the CI content can only be reported as the bulk average of the storage system. As hydrogen production increases for the transportation market, cost reductions through large scale, multi feed supply schemes are expected. Without book-and-claim on hydrogen, the use of such schemes and in the investment in low-carbon production is disincentivized.

Example 2: In some processes, such as renewable diesel production, the use of low-CI hydrogen from a pipeline system is a feedstock that helps enable the lowest possible CI final product. Such pipelines would typically have multiple H2 production sources with varying CI scores feeding it and, without being able to use book-and-claim methods to tie renewable diesel production to specific H2 sources along the pipeline, optimizing these low CI fuels is not possible and the addition of low-CI H2 sources to pipeline networks is not incentivized.

Conclusion

We appreciate CARB staff's consideration and commitment to improving the Low Carbon Fuel Standard. Successful adoption of battery and fuel cell electric vehicle technologies requires changes in LCFS to buttress market pricing and encourage deployment of fueling and charging infrastructure for zero-emission fleets. The undersigned associations and companies will continue to work in developing the vehicles, infrastructure, and low-carbon, zero-carbon and renewable hydrogen needed to build this market and reduce emissions. We look forward to collaborating with our partners in the charging community in pursuit of parity and conformity to streamline understanding of the infrastructure pathways.

Thank you,

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