

April 23, 2018

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Renewable hydrogen production, distribution, and dispensing; Air Liquide's recommendations to further improve the LCFS program.

Dear Chair Nichols and Board Members;

Air Liquide is pleased to submit for consideration by the California Air Resources Board (ARB) our industry perspective on the proposed Low-Carbon Fuel Standard (LCFS) rulemaking with respect to renewable hydrogen production, distribution, and dispensing. We believe that our recommendations will strengthen the LCFS program and promote additional private investments in renewable hydrogen, thus building upon California's investments to date. We are committed to increasing the availability of renewable hydrogen, a best-in-class low-carbon fuel, and further enabling the expansion of zero-emission vehicle infrastructure, consistent with Executive Order B-48-18 and the LCFS policy.

A substantial increase in renewable hydrogen production and distribution is key to meeting the goals of the LCFS policy. To be considered a renewable, zero-emission fuel, hydrogen must be produced, distributed and dispensed using renewable energy resources. While there are many pathways for hydrogen production, the most economical renewable hydrogen today is produced by either reforming of renewable biogas or electrolysis powered by renewable electricity. We are recommending the following changes and clarifications within the LCFS program to account for renewable resources used in hydrogen production, compression, liquefaction, distribution and dispensing, and to promote the development of renewable hydrogen fuels.

Renewable Power Usage in Production, Distribution, and Dispensing:

Electrical power is an important input in all aspects of hydrogen production, compression, liquefaction, distribution, and dispensing. Electricity is the primary input when hydrogen is produced by electrolysis from water, but electrical power is also a significant source of energy for compression, liquefaction, pumping, and refrigeration of hydrogen produced by any method. Therefore, it is important that the LCFS regulations recognize renewable electricity as such whenever it is used in a hydrogen pathway. For example, in proposed Section 95486.1, the credits available for improvements in the CI of electricity used for the production of hydrogen should also be available for improvements in the CI of electricity used for compression, liquefaction, distribution or dispensing:

Section 95486.1(e)(2): *Time-of-Use Pathways for Hydrogen Production. An entity can generate credits, in addition to credits generated pursuant to subsection (1), above, for improvements in the CI of electricity used for electrolysis to produce hydrogen, or for hydrogen compression, liquefaction, distribution or dispensing, due to time of use pursuant to section 95488.5 and the credit calculation in section 95486.1(c)(2)(B), where:*

Electricity is the total quantity of low-CI electricity supplied to the electrolyzer for production, or used for hydrogen compression liquefaction, distribution or dispensing.

Similarly, in proposed Section 95488.8(i)(1) the proposed text should be broadened to include reference to hydrogen compression, liquefaction, distribution and dispensing:

Section 95488.1(i)(1): *Book-and-Claim Accounting for Renewable or Low-CI Electricity Supplied as a Transportation Fuel or Used to Produce Hydrogen. Reporting entities may use indirect accounting mechanisms for renewable electricity to reduce the CI of electricity supplied as a transportation fuel, for hydrogen production through electrolysis, or for hydrogen compression, liquefaction, distribution or dispensing, provided the conditions set forth below are met...*

A parallel change should also be made in proposed subsection (i)(1)(a):

Section 95488.1(i)(1)(A): *Reporting entities may report electricity dispensed to electric vehicles or as an input to hydrogen production, compression, liquefaction, distribution or dispensing...*

A similar change should be made in Section 95488.10:

Section 95488.10(a)(4): *Any fuel pathway holder, including a joint applicant, who is not subject to site visits by a third party verifier, whose pathway involves the use of renewable or low-CI process energy, must submit invoices for that energy to the AFP. Additionally, for any electricity that is used to reduce carbon intensity of electricity for EV charging, ~~or~~ hydrogen production via electrolysis, or hydrogen compression, liquefaction, distribution or dispensing, the pathway holder must upload records demonstrating that any RECs generated were retired in WREGIS for the purpose of LCFS credit generation.*

Finally, a similar change should be made in the LCFS's reporting requirements:

Section 95491(d)(4)(D): *For hydrogen reported with a pathway that claims carbon intensity reductions for shifts in time of electricity use for electrolytic hydrogen production, compression, liquefaction, distribution or dispensing, the quantity of electricity (in kWh) used to produce, compress, liquefy, distribute and dispense hydrogen for each time-of-use window must be reported with transaction type FCEV Fueling – TOU.*

Applicability of Green Tariff Programs

Green Energy Tariff programs have the potential to open market opportunities for renewable hydrogen production, compression, liquefaction, distribution or dispensing. We recommend the LCFS Regulations be broadened to allow recognition of renewable electricity purchased under Green Tariffs from the utilities; within and outside California; and to include future programs. By leveraging the broader power agreements available in the region, we anticipate being able to provide lower cost renewable hydrogen along a more accelerated timeline than with the current limitations.

Partial Utilization of a Renewable Generation Asset

We request that CARB clarify that the following statement does not preclude a pathway applicant from contracting a portion of available renewable electricity from a provider:

Section 95488.8(i)(1(B)(1): *Electricity is generated using equipment owned by, or under contract to the pathway applicant for all environmental attributes of the project.*

For example, in the event that a pathway applicant contracts (through a PPA with the operator or through a utility Green Tariff) to utilize 30MW of a total available 100MW from a renewable generator, the renewable power should be credited in the CI calculation even though the applicant is not purchasing all of the power generated by the project.

These proposed revisions are intended to align with the objectives and direction in Executive Order B-48-18 and to ensure it is effective for increasing the supply of renewable hydrogen at refueling stations while decreasing the carbon intensity of this Zero Emission Vehicle (ZEV) fuel. The proposed changes will promote investments in renewable hydrogen and have only minimal impact on the overall LCFS policy and its stakeholders.

Thank you for your consideration. For further information on this proposal, please contact me at any time.

Best Regards

A handwritten signature in black ink, appearing to read 'David Edwards', with a large, sweeping flourish extending to the right.

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