

December 5, 2017

Feedback on 2018 LCFS Preliminary Draft Regulatory Amendment

Nel Hydrogen (NEL) appreciates the opportunity to provide feedback on the CARB “2018 LCFS Preliminary Draft Regulatory Amendment Text” as presented in the Pre-Rulemaking Public Meeting held on November 6, 2017.

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Our feedback both addresses the specific hydrogen fuel pathway proposals from CARB, as well as expression of our support to the “Hydrogen Infrastructure Investment Credits” concept as proposed to CARB by multiple industrial stakeholders in a separate feedback entry¹.

- **Feedback on CARB hydrogen electrolysis fuel pathways**

NEL compliments the CARB for their thorough assessment on new hydrogen fuel pathways, particularly with regard to outlining the various assumptions behind the analysis in the “Low Carbon Fuel Standard - Lookup Table Pathway” document – draft version Nov. 3, 2017². We only have few comments as outlined below.

The proposed CARB hydrogen fuel pathway (Table E.1 #6. *Gaseous H2 produced in California from on-site electrolysis using solar- or wind-generated electricity*) seems to assume that grid electricity is used for the compression and pre-cooling – resulting in a CI value of 11.01 gCO₂e/MJ. However, as the hydrogen fuel production is occurring onsite using renewable electricity, this will also apply to the compression and pre-cooling. Thus, the CI value should be zero (0 gCO₂e/MJ). This result also corresponds to the CI value for the legacy pathway T2R-1080 that had a similar description. See proposed pathway change in table below.

It is also highly relevant to add an additional pathway for central electrolysis connected to renewables. It may not always be possible to co-locate renewable electricity production (solar or wind) onsite at fueling stations. Central production with electrolysis connected directly to renewables with gaseous distribution is a relevant alternative. This pathway could easily be established by combining the step-wise CI values for “Gaseous H2 Transport” (13.71 gCO₂e/MJ) and “Gaseous H2 Compression and Precooling” (11.01 gCO₂e/MJ), resulting in a total CI of 24.72 gCO₂e/MJ. See proposed additional pathway (#7) in table below.

#	Fuel Pathway description	Total CI gCO ₂ e/MJ
6.	Gaseous H2 produced in California from on-site electrolysis using solar- or wind-generated electricity	11.01 0
7.	Gaseous H2 produced in California from central electrolysis using solar- or wind-generated electricity	24.72

- **Support for the “Hydrogen Infrastructure Investment Credits” proposal**

NEL strongly supports the concept and draft LCFS rule adjustment on “Hydrogen Infrastructure Investment Credits”³, as proposed by multiple industrial stakeholders in the referenced, separate feedback entry.

¹ https://www.arb.ca.gov/fuels/lcfs/workshops/11292017_airliquide-firstelement-honda-mercedesbenz-shell-toyota.pdf

² https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/110617lookuptable.pdf

³ https://www.arb.ca.gov/fuels/lcfs/workshops/11292017_airliquide-firstelement-honda-mercedesbenz-shell-toyota-attach.pdf

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The proposed LCFS credit generation based on installed fuel dispensing capacity will provide a solid basis for the continued and accelerated deployment of hydrogen fueling infrastructure. The recent 2017 AB 8⁴ report on the development of hydrogen fueling infrastructure estimates a hydrogen supply bottleneck around 2020. This is a result of the current level of hydrogen station funding under AB 8 (\$20 million/year) being insufficient to sustain the rapid growth in hydrogen fueling capacity needed for the continued fuel cell electric vehicle (FCEV) deployment. Additional LCFS credits generated on the hydrogen infrastructure investments would address the hydrogen supply bottleneck in a very effective manner.

Firstly, the proposed LCFS credit generation on investments should be consistent with the current LCFS policy intention, and thus possible to implement as an administrative adjustment of the current regulation. The intent of LCFS is to lower average carbon intensity of fuels, but this requires both supply and demand (consumer adoption via vehicle and fuel substitution). Credit generation on hydrogen infrastructure investments increases availability of low CI fuels where retail coverage is a constraint, enabling consumers to switch to low- and zero-emission vehicles. Limitations in the availability of fueling infrastructure, particularly for a zero-emission fuel such as hydrogen, could constrain progress to LCFS targets on the continued decline in the average CI for dispensed fuels.

Secondly, the proposed hydrogen investment LCFS credit generation has built-in mechanisms that ensures cost-effectiveness and sun-setting of the credit generating. As utilization of the hydrogen infrastructure increases, the credit generation from the investment decreases and is eventually phased out over a predetermined period. In comparison with other public incentives on renewables, for example, this provides a truly inherent and pre-determined sun-setting process.

Lastly, LCFS credit generation on hydrogen infrastructure investments will provide a level playing field between FCEVs and BEVs. Currently, electric utilities are providing various, attractive electricity rate schedule incentives to support the deployment of BEV charging infrastructure. However, these schedules only apply to BEVs, and not to hydrogen production and fueling. Also, CARB recently approved the first cycle *ZEV Investment Plan* by Volkswagen, where BEV infrastructure investments are exclusively funded, and FCEVs were deliberately omitted – regardless of how this contradicts the VW Court Decree requirements to promote “*brand neutrality*” and reduce “*adverse environmental impacts*” to the “*widest extent possible*.” The addition of LCFS credit generations on hydrogen infrastructure will compensate for this current imbalance in public incentives provided for FCEVs and BEVs.

Nel Hydrogen thanks the CARB for the opportunity to provide feedback. Should the CARB have any questions or need for further information, we would be happy to assist.

Best regards*Mikael Sloth**Vice President, Business Development***Nel Hydrogen Inc.**E-mail: mslot@nelhydrogen.com

⁴ https://www.arb.ca.gov/msprog/zevprog/ab8/ab8_report_2017.pdf