

STAFF SUMMARY
Method 2B Application
Gaseous Hydrogen via Electrolysis (Solar)
AC Transit, Emeryville, California
(Pathway Code: HYGNO06)

Deemed Complete Date: September 30, 2015
Posted for Public Comment Date: November 5, 2015
Certified Date: November 16, 2015

Pathway Summary

AC transit operates a hydrogen fueling facility, known as D2 facility, in Emeryville, CA. The total hydrogen dispensed includes on-site production as well as supply from the Linde Group. The on-site hydrogen is produced using a proton electrolyzer and two compression units. The electrolyzer unit has a capacity of 64 kg H₂/ day and the facility currently produces approx. 750 kg of compressed H₂ per month. The H₂ produced by electrolysis is co-mingled with H₂ procured from Linde and compressed at the two compression units. The compressed H₂ is finally delivered to HD and LD fueling stations at the same site.

Electricity for the on-site generated hydrogen is sourced from two solar installations with rated outputs of 425 kW and 510 kW. All of the generated solar electricity offsets all electrical energy required for electrolysis and H₂ compression at the D2 facility. In addition, since AC Transit is not claiming credits (i.e., RECs or any other) for its solar electricity, the applicant is requesting a CI of 0.00 gCO₂e/MJ for this pathway based on lifecycle analysis conducted using the CA-GREET 1.8b model.

Carbon Intensity of H₂ Produced

Electricity requirements for H₂ generation and compression (only the portion generated using electrolysis) are between 39% to 71% of total solar electricity generated during the four summer months of 2015 for which data are available. Therefore, under current operating conditions, the facility generates adequate solar electricity to offset all of the energy required for on-site H₂ production and compression. The gaseous hydrogen pathway utilizes the CA-GREET1.8b default values except for electrolysis and compression efficiencies. These values are based on the actual energy consumption data recorded by AC Transit. As shown in table below, the applicant has calculated the CI of its gaseous hydrogen pathway to be 0.00 gCO₂e/MJ.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (g CO ₂ e./MJ)		
			Direct Emissions	Land Use or other Indirect Effects	Total
Gaseous hydrogen	HYGN006	2B Application*: Gaseous hydrogen production via electrolysis using solar electricity	0.00	0.00	0.00

*Specific Conditions Apply.

Operating Conditions

Due to limited data for solar electricity generation, staff cannot determine if the production levels can be sustained as reported in the data submitted for four months in 2015. Staff therefore, imposes constraints on production of H₂ from this pathway which are listed below. If AC transit can meet the conditions listed below, they can continue to retain their certified CI (based on this application) and continue to generate LCFS credits.

- The company shall provide evidence that generated solar electricity offsets all of the electricity used in on-site H₂ production and compression.
- The company shall provide quarterly receipts for the next seven quarters to support quantity of H₂ produced on-site by electrolysis; energy consumed for electrolysis; H₂ procured from external vendor(s); total compression energy at the facility; and total solar electricity production.
- AC transit shall affirm that electricity generated at their solar installations is not used to offset credits under any other program (GHG-based or otherwise).

Staff Analysis and Recommendation

ARB staff has reviewed the AC Transit application and has replicated, using the CA-GREET 1.8b model, the carbon intensity value calculated by the applicant. AC Transit provided documentation for the facility's energy use, solar electricity, and H₂ production for four months in 2015. Staff is satisfied that the energy consumption values in the application accurately represent the AC Transit actual current energy use and solar electricity production. Staff agrees that the company is currently generating adequate solar electricity required for all of the on-site H₂ production and subsequent compression. Consequently, staff believes that the carbon intensity value of

0.00 gCO₂e/MJ is an accurate representation of the carbon intensity of AC Transit's gaseous H₂ pathway. Upon pathway certification, LCFS credits may be claimed only for the electrolyzer produced hydrogen as claimed in this application. Since the applicant provided only four months of data, staff recommends that the AC Transit's Method 2B application be provisionally approved.