CALIFORNIA AIR RESOURCES BOARD

Low Carbon Fuel Standard
Tier 2 Pathway Application

Application No. B0349

Updated: 09/29/2022 (See Underlined Text)

Staff Summary

Shell Energy, North America (6154)
Fuel Production Facility:
Air Products & Chemicals – Carson Hydrogen Plant (F00059), Carson, California
Gasified Hydrogen from Renewable Biomethane

Intermediate Facilities: RDF Stevens, LLC, Morris, MN (71701)
District 45 Dairy Digester, Hancock, MN (F00393)

Joint Applicant: AMPRENEW OFFTAKE I LLC (9041)

Deemed Complete Date: 6/30/2022
Posted for Comment Date: 9/2/2022
CI Certified Date: 9/29/2022
CI Start Date: 4/1/2022

Pathway Summary

Shell Energy, North America (Shell Energy) seeks certification of a renewable hydrogen pathway produced by steam methane reformation at the Air Products and Chemicals - Carson Hydrogen Plant, in Carson, California (Carson Hydrogen Plant), using book-and-claim accounting for biomethane refined from dairy manure-derived digester gas (RNG). Environmental attributes of dairy and swine manure (DSM) derived biomethane are procured from the RDF Stevens Upgrader located in Morris, Minnesota. The upgrading facility is registered to ampRenew Offtake I, LLC (9041) which is a joint applicant to the pathway. The biomethane used for book-and-claim accounting[1] was previously certified in 2022 as a CNG pathway as follows:

B025001 (2022): District 45 Digester to RDF Stevens Upgrader (71701) (CI =-182.67).

Gaseous hydrogen is produced at the Carson Hydrogen Plant in Carson, California, and transported by pipeline to Shell Energy's hydrogen refueling station in Torrance, California approximately 9 miles away for dispensing into fuel cell vehicles.

[1] All citations to the LCFS Regulation are found in Title 17, California Code of Regulations (CCR), section 95480-95503. Book-and-claim accounting for Renewable or Low-CI electricity and Biomethane is primarily addressed in section 95488.8(i) of the LCFS Regulation.

The pathway is consistent with the Lookup Table Compressed H2 pathway produced in California from central steam methane reforming of biomethane (HYF)[2] with two notable exceptions: the gaseous hydrogen transportation distance is lower than the default 100 miles distribution distance modeled in the Lookup Table pathway CI, and the feedstock for hydrogen production was matched to biomethane attributes derived from dairy and swine manure digester gas with favorable carbon intensity (CI). Therefore, this pathway requires a Tier 2 application (95488.5(a)).

Carbon Intensity of Fuel Type Pathways

The CIs are determined from life cycle analysis conducted using the Board-approved CA GREET3.0 model. Model inputs are identical to those documented in the Lookup Table Technical Support Documentation[3] with the exceptions of the site-specific gaseous hydrogen transport distance of 9 miles by pipeline (as opposed to 100 miles transport by heavy duty diesel truck carrying tube trailer), and lower upstream emissions for sourced biomethane from dairy digester gas. The following table lists the proposed CI for this pathway.

Proposed Pathway CI

Pathway Number	Fuel & Feedstock	Pathway FPC	Pathway Description	Carbon Intensity (gCO2e/MJ)
B034901	Compressed Hydrogen (G.H2) produced from Biomethane refined from Dairy Manure-derived Digester Gas	HYG026B03490100	Gaseous Hydrogen produced at Air Products and Chemicals – Carson Hydrogen Plant using Biomethane derived from digester gas generated at District 45 Dairy Digester and upgraded at RDF Stevens in Morris, MN; transported via pipeline to refueling station in Torrance, California.	-151.76

[2] See Lookup Table (Table 7-1 in section 95488.5(e)) of the Final Regulation Order approved by the Office of Administrative Law (OAL) on January 4, 2019 for the Low Carbon Fuel Standard.

[3] CA-GREET3.0 Lookup Table Pathways Technical Support Documentation. Available at: https://ww3.arb.ca.gov/fuels/lcfs/ca-greet/lut-doc.pdf

Operating Conditions

The certified CI value in the above table may be used to report and generate credits for fuel quantities that are produced at the facility in the manner described in the applicant's Life Cycle Analysis (LCA) report, and dispensed for transportation use in California, subject to the following requirements and conditions:

1. Fuel pathway holders are subject to the requirements of the California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations. Requirements include ongoing monitoring, reporting, recordkeeping, and third-party verification of operational CI and a controlled process for providing product transfer documents or other similar records to counterparties or CARB.

2. Fuel distribution route: Gaseous Hydrogen produced by central SMR at the Air Products and Chemicals Carson Hydrogen Plant located at 23300 South Alameda St., Carson, California is compressed and transported via pipeline over a distance of 9 miles to the Shell Energy hydrogen refueling station located at 2051 W. 190th Street in Torrance, California.

3. The initial validation of fuel pathway inputs by a Verification Body for fuel pathway certification is not required except for the modifications to the transportation and distribution (T&D) parameters identified in the Operating Condition above.

4. To confirm compliance with LCFS reporting requirements, the pathway holder will provide on an annual basis, the total monthly quantity (MMBtu) of biomethane produced and injected into the common carrier pipeline at the upgrading facility, and identify each LCFS fuel reporting entity or other final owner (including any business partners not participating in the LCFS) of environmental attributes, and the quantity of environmental attributes (MMBtu) transferred by the upgrading facility to each other entity.

5. For Annual Fuel Pathway Report (AFPR) compliance purposes, the pathway applicant/holder will report the fuel transport distance. The AFPR for these pathways is due in 2022, and annually thereafter. The applicant/pathway holder's AFPR must include the Operational CIs for the fuel pathway proposed for certification in this application, as well as the Operational CIs for Shell Energy's other fuel pathways identified in the table below.

Shell Energy's Certified Pathway CIs for Carson Hydrogen Plant

Pathway Number	Pathway Description	Fuel	Certified CI
L007601	Compressed Hydrogen produced in California from central SMR of biomethane (renewable feedstock) from North American landfills	Gaseous Hydrogen (G.H2)	99.48
T040801	Compressed Hydrogen produced in California from central SMR of biomethane derived from dairy manure with process energy from grid electricity, natural gas and/or renewables	Gaseous Hydrogen (G.H2)	-50.00
L006301	Compressed Hydrogen produced in California from central SMR of North American fossil-based Natural Gas	Gaseous Hydrogen (G.H2)	117.67

Staff Analysis and Recommendation

Staff has reviewed the Shell Energy, N.A. application for a hydrogen pathway based upon renewable biomethane attributes procured from digester gas generated at District 45 Dairy Digester in Hancock, Minnesota and upgraded at RDF Stevens in Morris, Minnesota. CARB Staff have replicated using the GREET3.0 model the carbon intensity calculations provided by the applicant. Based on this finding, CARB Staff recommend that the Shell Energy fuel pathway application for LCFS Tier 2 pathway stated in the above table be certified after all the comments received during the 10-day public comment period are addressed satisfactorily by the applicant.
The certification is subject to the operating conditions set forth in this document.

Comments and Certification

CARB has reviewed the applicant's response to comments received during the 10-day comment period, determined that these adequately address factual and methodological errors, and certified the pathway.