CALIFORNIA AIR RESOURCES BOARD

Low Carbon Fuel Standard
Tier 2 Pathway Application

Application No. B0378 Updated: 12/19/2022 (See Underlined Text)

Staff Summary

Iwatani Corporation of America, Inc.
Fuel Production Facility: Linde-Praxair SMR
Hydrogen Produced from Renewable Natural Gas

Intermediate Facility: Johnston Regional Energy – Raeger Biogas (71131)
Joint Applicant: Element Markets Renewable Energy, LLC (5877)

Deemed Complete Date: 9/30/2022
Posted for Comment Date: 11/3/2022
CI Certified Date: 12/19/2022
CI Start Date: 7/1/2022

Pathway Summary

Iwatani Corporation of America (Iwatani) seeks ~~provisional~~ certification of two renewable hydrogen pathways; liquefied and gaseous hydrogen, produced by steam methane reformation at the Linde-Praxair SMR facility located in Ontario, California facility using book-and-claim accounting for biomethane (RNG) derived from landfill gas.

Environmental attributes of landfill gas derived biomethane are procured from the Johnstown Regional Energy – Raeger Landfill located in Johnstown, PA.
The biomethane source used for book-and-claim accounting was previously certified in March of 2021 as a CNG pathway – A026701 (2021): Raeger Landfill Biogas (71131) with a carbon intensity (CI) of 35.51 gCO_{2e} per megajoule.

Gaseous and liquefied hydrogen is produced at the Linde-Praxair SMR facility in Ontario, California and transported by tube trailer and liquid tanker trucks, respectively, to hydrogen fueling stations for dispensing into fuel cell vehicles in both Northern and Southern California.

The pathways are consistent with the Lookup Table Liquefied and Gaseous H2 pathway produced in California from central steam methane reforming of biomethane (HYB and HYBL) with two notable exceptions: the liquid and gaseous hydrogen transportation distance exceeds the transportation distance modeled in the Lookup Table pathway CIs, and the feedstock for hydrogen production was matched to biomethane attributes derived from landfill gas production facility with favorable carbon intensities (CIs). Therefore, these pathways require a Tier 2 application (95488.5(a)).

Carbon Intensity of Fuel Type Pathways

The CI is determined from life cycle analysis conducted using a modified version of the Board-approved CA GREET3.0 model. Model inputs are identical to those documented in the Lookup Table Technical Support Documentation[1] with the exceptions of the site-specific liquid and gaseous hydrogen transport distance of 426 miles and 100 miles, respectively, and lower upstream emissions for sourced biomethane. 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)
B037801	Hydrogen from Landfill Gas	HYL025B03780100	Liquefied Hydrogen produced at Linde-Praxair SMR using Biomethane derived from landfill gas generated at Johnstown Regional Energy - Raeger Landfill in Johnstown, PA; finished fuel transported as liquefied Hydrogen in tanker trailers and re-gasified, recompressed, at refueling stations in California.	107.19

[1] CA-GREET3.0 Lookup Table Pathways Technical Support Documentation. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/lut-doc.pdf

B037802	Hydrogen from Landfill Gas	HYG025B03780200	Gaseous Hydrogen produced at Linde-Praxair SMR using Biomethane derived from landfill gas generated at Johnstown Regional Energy - Raeger Landfill in Johnstown, PA; finished fuel transported as gaseous Hydrogen in tube trailers to refueling stations in California.	75.16

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. Liquid fuel distribution route: Hydrogen produced at the Linde-Praxair SMR Hydrogen Plant located at Ontario, California is liquefied and transported by liquid tanker truck to Iwantani Corporation of America's (ICA) liquid hydrogen stations in California. The conservative distance of liquid hydrogen delivered to all stations must not exceed 426 miles to maintain compliance with the certified fuel pathway.

3. Gaseous fuel distribution route: Hydrogen produced at the Linde-Praxair SMR Hydrogen Plant located at Ontario, California is compressed and transported by

gaseous tube trailer truck to hydrogen refueling stations. The conservative distance of gaseous hydrogen delivered to all stations must not exceed 100 miles to maintain compliance with the certified fuel pathway.

4. The initial validation of fuel pathway inputs by a Verification Body for fuel pathway certification is not required since the only modifications to the CA-GREET3.0 lifecycle analysis model inputs are the transportation and distribution (T&D) parameters to identified refueling stations using maximum transport distance between the fuel production facility and the refueling stations.

5. 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.

6. Iwatani shall provide in all subsequent AFPRs required for compliance the most recent verified Operating CIs for biomethane feedstock sourced from each one of the facilities whose renewable attributes are matched to the feedstock used for Iwatani pathways being proposed for certification. Iwatani must additionally include and continually update in its Monitoring Plan a table listing each biomethane source along with its associated certification date, and the current or most recent AFPR filing with CARB. Uncertified biomethane fuel pathways are not within the scope of this application or eventual certified pathways.

Staff Analysis and Recommendation

Staff has reviewed the Iwatani Corporation of America and joint applicant Element Markets Renewable Energy's application for hydrogen pathways, and has replicated, using the GREET3.0 model the carbon intensity calculations provided by the applicant. CARB has deemed that the initial validation of fuel pathway inputs by a Verification Body for fuel pathway certification is not required. Based on this finding, CARB staff recommends that the Iwatani fuel pathway application for LCFS Tier 2 pathways 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

<u>These pathways did not receive public comments during the 10-day comment period. CARB certified the pathways.</u>