

Application No. B0604
Updated: 6/28/2024 (See Underlined Text)

Staff Summary

Anew RNG, LLC
Snowflake Farm, Snowflake, Arizona
Compressed Natural Gas (CNG) from Swine Manure

Deemed Complete Date: 2/15/2024
 Posted for Comment Date: 6/13/2024
 CI Certified Date: 6/28/2024
 CI Start Date: 1/1/2024

Pathway Summary

Anew RNG, LLC seeks provisional certification of a Tier 2 pathway for pathways for biomethane (Bio-CNG)¹ production at Snowflake Farm in Snowflake, Arizona. Biogas is produced from anaerobic digestion of swine manure sourced from co-located Snowflake Farm. Biogas is upgraded to biomethane to meet common carrier pipeline specifications and then trucked to the pipeline interconnect with El Paso Natural Gas Company, LLC (EPNG) commercial pipeline, which is owned by the Kinder Morgan pipeline company. Biogas is upgraded to biomethane pipeline injected and supplied to CNG vehicles in California as bio-CNG using book-and-claim accounting for biomethane.²

Anew RNG, LLC owns the environmental attributes associated with the biomethane and sells these attributes using book-and-claim accounting through its contracted California transportation fuel dispensers. This project previously participated in the federal Renewable Fuel Standard Program but has never participated in the California Cap-and-Trade Offset Program.

The Snowflake Farm and open lagoons were built in 2002. Currently, it has an approximate livestock population of 104,450 swine. Under the baseline condition, the manure is scraped and flushed with lagoon recycle water without the use of solids-liquid separation. The manure has been gravity-fed from the barns to the open

¹ "Bio-CNG" means biomethane which has been compressed to CNG. Also referred to herein as biomethane or renewable natural gas (RNG).

² All citations to the LCFS Regulation are found in Title 17, California Code of Regulations (CCR), section 95480-95503. Book-and-claim accounting for biomethane is primarily addressed in section 95488.8(i) of the LCFS Regulation.

lagoons and remained there long enough to let the water be evaporated. The lagoons are partially cleaned out every 10 to 15 years.

Prior to the construction of the biogas collection system, 18 lagoons were found at the facility. Snowflake Farm completed the construction of four new covered lagoon digesters in 2022. Under the project condition, the manure is scraped and flushed with lagoon recycle water and continues to be gravity-fed from the barns to the digesters, the nursery sites use lift stations to pump barn manure to the digester. The digestate from the digester passes to the evaporative pounds and remains there long enough to let the water be evaporated. The swine manure is digested in the covered lagoon digesters that capture methane that would otherwise be emitted to the atmosphere under baseline manure treatment in the anaerobic lagoon.

Snowflake Farm raw biogas from the digesters is piped to the on-site upgrading facility and processed to pipeline quality RNG for injection to the third-party pipeline system. The biogas upgrading system includes two biogas compression systems, membrane separators, tail gas thermal oxidizer (TOX), product gas H₂S polishing beds, and auxiliary systems. A portion of the gas that is not destined for pipeline injection is either destroyed in the TOX as tail gas or recirculated back to the digesters. The biomethane is compressed and then trucked to the pipeline interconnect with EPNG commercial pipeline. Pipeline-injected RNG is delivered to CNG vehicle fueling stations in California using indirect ("book-and-claim") accounting.

Carbon Intensity of Fuel Type Pathways

The CI is determined from life cycle analysis conducted using a modified version of the Board-approved Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure.³ The calculator was modified to explain calculation changes, especially new process units/life cycle stages or inputs. The modified calculator has been determined to be equivalent to CA-GREET3.0 pursuant to section 95488.7(a)(1) of the LCFS regulation. The applicant has provided operational data and supporting documentation for the list life cycle stages, unit operations, transport of feedstock and/or fuel (e.g., digester, gas cleanup, and pipeline injection of biomethane) for a period of 4 months, from September 2022 to December 2022. The following table lists the proposed CI for this pathway.

³ The Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure (August 13, 2018), incorporated by reference in the LCFS Regulation, section 95488.3(b).

Proposed Pathway CI				
Pathway Number	Fuel & Feedstock	Pathway FPC	Pathway Description	Carbon Intensity (gCO ₂ e/MJ)
B060401	CNG from Swine Manure	<u>CNG044B06040100</u>	Biogas from swine manure at Snowflake Farm in Snowflake, AZ; upgraded to pipeline quality at Snowflake Farm; trucked to pipeline injection site and pipelined to California for transportation use	-419.55

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. CARB has reviewed the contractual agreements between the pathway holder/biogas upgrader, and marketer(s). All unredacted contract agreements relevant to this biomethane fuel pathway were submitted to CARB as part of the application, pursuant to section 95488.8(i)(2)(B). To confirm compliance with Annual Fuel Pathway Report requirements, the pathway holder shall notify CARB of any change in existing contracts that were submitted to CARB with the fuel pathway application, including any new contracts and termination of existing contracts, with any entity engaged in the transfer, purchase, or sale of biomethane and its environmental attributes. Failure to notify CARB of such a change could result in enforcement action and could invalidate this fuel pathway.

Fuel pathway holders must update the list of Bio-CNG dispensing entities and any biomethane end users at the time of Annual Fuel Pathway Report submission. Contractual agreements from the fuel dispensing entities do not need to be submitted in the original fuel pathway application or the Annual Fuel Pathway Reports; instead, they must be verified as part of the annual verification of the Quarterly Fuel Transactions Reports.

3. The biomethane and its environmental attributes claimed under this pathway shall not be claimed by any entity for any other purpose, nor under any other program notwithstanding the exceptions listed in LCFS Regulation section 95488.8(i)(2). The LCFS places no restriction on the use of any emission reduction credits generated by the project for emission reductions that are demonstrated to be additional to reductions claimed under the LCFS.
4. The fuel pathway holder must include the assumptions and calculations used to establish the fraction of solids input to each manure management system in its Annual Fuel Pathway Report submitted to CARB for third-party verification of the operational CI.
5. Any quantity of biomethane metered at inlet to the upgrading facility that cannot be demonstrated by meter records to have been pipeline injected or destroyed,

must be calculated by energy balance and accounted for in the CI as a fugitive methane emission if the calculated value exceeds the default 2% fugitive emission.

6. Each dairy/swine farm supplying manure to a digester will be subject to third-party verification to support the fraction of volatile solids inputs to the modified Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure for baseline and project modeling (Manure-to-Biogas (LOP Inputs) tab). CARB must be immediately notified through the AFP if any changes to dairy/swine manure suppliers and sources (e.g., additional suppliers or manure from different types of livestock) are made from the certified pathway. Modifications to the dairy/swine manure suppliers and sources may require submission of a new pathway for review, validation, and certification. Failure to notify CARB of such a change may result in invalidation of this fuel pathway and/or associated LCFS credits generated, and/or associated enforcement action.
7. The fuel pathway applicant/holder must maintain a manifest system for each load transported, recording information and events as they occur. Each set of manifest forms (bill of lading or BOL) must include the following information:
 - a. A consecutive numerical tracking number
 - b. Tube trailer specifications, such as capacity and operating pressure
 - c. Company name and addresses (physical and mailing) and printed names of the upgrading facility representative and truck operator
 - d. Metered biomethane quantity loaded and date/time transferred from biomethane upgrading facility operator to the transport company representative, signed by both the upgrading facility representative (Terminal Manager) and truck operator.
 - e. Metered biomethane quantity offloaded and date/time delivered and injected to the common carrier pipeline, signed by the pipeline injection facility representative (Terminal Manager).
 - f. The upgrading facility operator and fuel pathway holder must retain the completed manifest forms (hard, scanned, or electronic copies) for 10 years.
8. The metered quantity of biomethane that is eligible for reporting transactions under this pathway is referred to as the Conservative Monthly Offloading Quantity and must be equal to the lesser of the two metered quantities, loaded and offloaded, on a monthly basis. The conservative monthly offloading quantity is subject to two additional constraints described below:
 - a. Metered quantities of biomethane loaded and offloaded from CNG tube trailers are established through automatic data archival in the data historian system, and subsequently copied onto the bills of laden (BOLs). Due to human error in the BOL creation and signing process, discrepancies between the monthly BOL quantities and monthly historian quantities are expected to occur. A margin of error threshold of 5% discrepancy between

these quantities is established to determine eligible quantities for reporting:

If the discrepancy between the monthly loading BOL quantity and monthly loading historian quantity is equal to or lower than the 5% margin of error, then the monthly loading quantity is the monthly historian loading quantity. Likewise, if the discrepancy between the monthly offloading BOL quantity and monthly offloading historian quantity is equal to or lower than the 5% margin of error, then the monthly offloading quantity must equal the monthly historian offloading quantity. If the discrepancy between the monthly offloading BOL quantity and monthly offloading historian quantity is higher than the 5% margin of error, then monthly offloading quantity must be the lower of the monthly BOL offloading quantity and monthly historian offloading quantity.

- b. If the pipeline injection statement quantity is less than the sum of the conservative monthly offloading quantities for all facilities injecting biomethane at the EPNG pipeline, each of the facility's biomethane quantities must be adjusted on a pro-rata basis so that the aggregate Final Monthly Quantity does not exceed the pipeline injection statement.

If the pipeline injection statement quantity is greater than the sum of all facilities injection biomethane at EPNG pipeline, the excess biomethane is not eligible for reporting for credit generation. The biomethane quantity attributable to Snowflake Farm limited to the conservative monthly offloading quantity.

- 9. The fuel pathway holder must maintain records of venting events associated with biomethane transport by truck and report estimated venting quantities and the estimation method used in its Annual Fuel Pathway Report submitted to CARB for third-party verification of the operational CI.
- 10. The fuel pathway holder must report total injection site facility energy use and biomethane flow, and the calculations used to allocate these parameters to each digester pathway based on its monthly share of total biomethane measured at the injection site facility, in its Annual Fuel Pathway Report submitted to CARB and subject to third-party verification of the operational CI.
- 11. Notwithstanding the lack of accurate measurement for quantifying the biogas enters the upgrading facility, CARB approves the applicant/holder's request to report the biogas flow and methane concentration in the "Biogas-to-RNG" tab fields 2.6 and 2.7 to be that of fields 2.4 and 2.5, only if there is no biogas flaring or venting between the digester and the upgrading facility. The verifier must confirm the system configuration and fuel pathway holder must notify CARB of any change in process design or facility configuration that deviates from the approved operation.

12. For any rejected product gas from the upgrading facility returned to the digesters, the net biogas produced by the digesters shall be computed based on the mass balance. The fuel pathway holder must populate fields 2.4 through 2.7 in the 'Biogas-to-RNG' worksheet of the DSM Calculator by subtracting the recycled gas flow and methane content in recycled gas from the metered flow and methane content of raw biogas. All site-specific input data used in these calculations are subject to verification.

Staff Analysis and Recommendation

Staff has reviewed the application and has replicated, using the Tier 2 modified version of the Simplified CI Calculator, the CI values calculated by the applicant. EcoEngineers (H3-20-008) submitted a Positive validation statement. Staff recommends this application be certified on a provisional basis after all the comments received during the 10-day 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.