CALIFORNIA AIR RESOURCES BOARD

Low Carbon Fuel Standard
Tier 2 Pathway Application

Application No. B0724 Updated: 09/11/2025 (See Underlined Text)

Staff Summary

LoCI Controls, Inc.
Yolo County Central Landfill, Woodland, California
Low-CI electricity from landfill gas

Deemed Complete Date: 10/11/2024
Posted for Comment Date: 8/18/2025
Carbon intensity (CI) Certified Date: <u>9/11/2025</u>
CI Start Date: <u>4/1/2025</u>

Pathway Summary

LoCI Controls, Inc (LoCI) seeks provisional certification of a Tier 2 pathway for low-CI electricity produced from landfill gas (LFG) generated at Yolo County Central Landfill located in Woodland, California. The landfill is owned by Yolo County and operated by the County's Department of Community Services, Division of Integrated Waste Management.

LoCI installed an automated collection system (ACS) on nearly 100% of the gas collection wells at the landfill in July 2023. Prior to July 2023, the LFG collection system was managed manually based on monthly measurements and valve adjustments. This manual LFG monitoring and collection approach is the conventional way used at landfills across the U.S. and allows landfills to comply with applicable regulatory requirements. The ACS helps collect additional LFG due to continual monitoring of LFG collection and its composition, and automatic adjustments to the system valves and vacuum level to optimize LFG collection efficiency. With the installation and operation of the ACS system, the landfill operator has started collecting more LFG compared to the LFG collection in prior years.

The collected LFG is mixed with the incoming biogas produced from an in-vessel digester processing organic waste. The comingled LFG is sent to a treatment unit to remove moisture. The treated LFG is finally fed into five reciprocating engines to generate low-CI electricity. When the reciprocating engines are unavailable for any reason, the LFG is destroyed in an enclosed flare.

The applicant requests certification of low-CI electricity that is produced exclusively from LFG including incremental LFG capture due to the installation of the ACS system. Therefore, the biogas produced from the in-vessel digester is excluded from the system boundary.

Carbon Intensity of Low-CI Electricity Pathway

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 North American Landfills[1] to accommodate conversion of LFG to electricity. To account for avoided methane credit adjustments related to the reciprocating engine efficiency, the CI adjustments were performed using the same approach described in LCFS Guidance Document 19-06.[2] 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 LFG collection prior to the installation of the ACS system served as a baseline. LoCI used a GHG quantification methodology[3] developed and approved by American Carbon Registry (ACR) to calculate the baseline LFG capture, and incremental LFG capture from the ACS project. The baseline LFG capture represents a historical three-year average of theoretical LFG capture based on EPA Greenhouse Gas EGGRT-vetted data and formulas prior to LoCI installation and operation. LoCI selected the operating years of 2020 through 2022 to establish the Baseline. The avoided methane emission credit is calculated for incremental LFG capture and destruction associated with use of the ACS in this pathway application.

The applicant has provided operational data and supporting documentation for the assessment of LFG production, flaring and electricity generation from the landfill for a period of 9 months, from July 2023 to March 2024. The following table lists the proposed CI for this pathway. This pathway will accordingly be classified as provisional until 24 months of operational data become available.

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[1] Tier 1 Simplified CI Calculator for Biomethane from North American Landfills (August 13, 2018), incorporated by reference in the LCFS Regulation, section 95488.3(b).

[2] LCFS Guidance 19-06 (Revised October 2019): Determining Carbon Intensity of Dairy and Swine Manure Biogas to Electricity Pathways

[3] American Carbon Registry. Methodology for the Quantification Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Landfill Gas Destruction and Beneficial Use Projects, Version 2.0, dated April 2021, including the Errata & Clarification to the Methodology dated March 17, 2023.

Proposed Pathway CI				
Pathway Number	**Fuel & Feedstock**	**Pathway FPC**	**Pathway Description**	**Carbon Intensity (gCO2e/MJ)**
B072401	Electricity from Landfill Gas	ELC025B 07240100	Low-CI electricity generated from Landfill Gas using reciprocating engines at Yolo County Central Landfill in Woodland, California; Electricity used as transportation fuel in California	-101.05

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. The electricity, including the environmental attributes associated with the electricity, claimed under this pathway shall not be claimed under any other program notwithstanding the exceptions listed in LCFS Regulation section 95488.8(i)(1). The LCFS places no restriction on the use of any voluntary emission reduction credits generated by the project for emissions that are demonstrated to be additional to reductions claimed under the LCFS.

3. An energy balance shall be used to calculate fugitive methane emission based on the difference between metered biomethane captured and metered biomethane destroyed. If the calculated value is less than the default 1% fugitive methane emission, the default 1% value must be used. If the calculated value exceeds the default 1% fugitive methane emission, the calculated value

must be used. LoCI shall, no later than 12/01/2025, install all the following meters for the purpose of calculating fugitive methane emission via energy balance:

1) an LFG composition analyzer to measure the methane content of commingled LFG upstream of the condensate tank; and
2) an LFG flow meter and an LFG composition analyzer downstream of the gas cooler unit and upstream of the reciprocating engines.

4. If applicable, to confirm compliance with LCFS Regulation section 95488.8(h) and demonstrate use of directly supplied low-CI process energy in Annual Fuel Pathway Reports, the fuel pathway holder must demonstrate retirement of the corresponding quantity of Renewable Energy Certificates (RECs) that were generated from low-CI electricity used as process energy within the fuel pathway (use of onsite electricity from LFG in field 2.10). REC retirement may not be applicable if the pathway holder can demonstrate the low-CI electricity used as process energy (field 2.10) did not generate RECs during the entire reporting period. For each quarter of operation, the number of RECs (if generated) associated with process energy must be retired in a WREGIS retirement sub-account named "Low-CI Process Energy at LCFS Facility [ID number]" where the LCFS Facility ID is the number assigned in the AFP at the time of facility registration. These RECs and the associated environmental attributes can no longer be sold, transferred, or claimed by any entity or for any other purpose. The WREGIS report demonstrating REC retirement must be downloaded from WREGIS and uploaded to the AFP as part of each Annual Fuel Pathway Report to demonstrate the quantity of electricity from LFG that is consumed within the fuel pathway and claimed to lower the CI of the produced fuel. Note that this retirement account for process energy is distinct from and in addition to the requirement for any fuel reporting entity claiming electricity supplied for use as transportation fuel in the LRT under this pathway to demonstrate quarterly REC retirement as part of each quarterly report.

5. CARB approves a fuel pathway CI that reflects the reduction of greenhouse gas emissions achieved by the voluntary capture of methane via the installation of ACS at the landfill, provided that the ACS installation is additional to any legal requirement for the capture and destruction of biomethane. This CI is subject to the following requirements for credit generation:

   a. *Crediting Periods.* Avoided methane crediting is limited to two consecutive 10-year crediting periods, counting from the quarter following Executive Officer approval of the application. The pathway holder must formally request each subsequent crediting period for the project through the AFP.

   b. Notwithstanding (a) above, in the event any law, regulation, or legally binding mandate requiring the installation of ACS at the landfill is enacted, the project is only eligible to continue to receive LCFS credits for the use of ACS for the remainder of the project's current crediting period. The project may not request any subsequent crediting periods.

6. CARB approves the use of the *ACR LFG Methodology v2.0* [4] for calculating avoided methane associated with ACS installation, with the following modifications that are intended to limit avoided methane only to landfill gas collection improvements that would not occur under conventional landfill gas collection systems:
    a. If the site-specific "Updated Calibrated Collection Efficiency" (UCCE), as determined by Equation 8 in the ACR model, is lower than 75 percent for a given month in the operational data period in the calculator, the UCCE for that month must be set equal to 75 percent.
    b. To account for collection efficiency improvements that may have occurred in absence of the project, the minimum UCCE must be increased by one percent for each calendar year after the ACS was installed. For example, with Yolo Landfill's ACS install date of July 2023, the calculated UCCE will be adjusted upwards to 76 percent for 2024, to 77 percent for 2025, etc.
    c. If the baseline LFG collection is higher than the actual LFG collection with ACS in any month, the negative incremental LFG collection should not be zeroed out.

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 value calculated by the applicant. TUV SUD America, Inc. (H3-24-081) submitted a positive validation statement. Staff recommends this application be certified on a provisional basis after all the comments received during the 14-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

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

[4] https://acrcarbon.org/wp-content/uploads/2023/03/ACR-LFG-Methodology-v2.0.pdf (Accessed on August 11, 2025)