Amp Americas

July 12, 2023

Cheryl Laskowski
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on the Draft Tier 1 Carbon Intensity Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure

Dear Dr. Laskowski:

On behalf of Amp Americas ("Amp"), we appreciate the opportunity to provide feedback on the Draft Tier 1 Carbon Intensity Calculator ("Calculator") for Biomethane from Anaerobic Digestion of Dairy and Swine Manure and associated Instruction Manual ("Instructions"). Amp strongly supports California's climate goals and the Low Carbon Fuel Standard ("LCFS") Program as an important element of the State's overarching climate change framework. We especially support the California Air Resources Board's ("CARB") efforts to focus on increased methane reductions in line with the 2022 Scoping Plan.

About Amp Americas

Founded in 2011, Amp develops and operates renewable natural gas ("RNG") facilities that convert dairy waste into carbon-negative renewable energy. Over our history, Amp's projects have prevented over 1.5 million metric tons of carbon equivalent emissions. In 2022 alone, our projects abated approximately 480,000 metric tons of carbon equivalent emissions and we plan to rapidly expand our impact over the next several years.

As a pioneer in the dairy RNG industry, Amp registered the first 5 dairy RNG-to-CNG pathways in California's LCFS, and was the RNG supplier for the first 11 dairy RNG-to-hydrogen pathways. Our experience developing, operating, and reporting on these and other assets gives us a unique perspective on the impact CARB policy has on development of projects to reduce greenhouse gas ("GHG") emissions. Our projects and resulting methane and carbon dioxide reductions have been made possible by CARB's leadership in decarbonizing transportation, and we encourage CARB to continue to support the technology-neutral, performance-based framework that has made it so successful.

All Biomethane Pathway Calculators Should Include the Option to Model Biogas-to-Electricity Carbon Intensity Scores

Amp recommends that all biomethane Tier 1 calculators should have the biogas-to-electricity carbon intensity ("CI") calculation built into the Calculator. This will simplify all biogas-to-electricity pathways, in line with CARB's goals of simplicity and transparency. It will also align with state efforts to transition to zero emission vehicles, while reducing CARB staffing resource requirements and review time for new pathways.

Alternatively, CARB could develop an additional Tier 1 calculator that takes a biomethane pathway as an input and converts it to electricity for use in electric vehicles ("EVs"). This is a similar approach to what CARB has done for hydrogen pathways in the Draft Hydrogen Simplified Tier 1 Calculator and is in line with CARB's expressed a desire to see biogas/RNG resources utilized outside of natural gas vehicle applications (including into fuel cells and other power generation equipment), increase methane reductions, and increase vehicle fleet electrification. Including a biogas-to-electricity CI calculation in all biomethane calculators will support this transition and simplify processing time for these pathways.

Allow Applicants to Account for Actual Fugitive Methane Performance

The Tier 1 framework should allow projects the ability to report project-specific fugitive methane levels, even if they are lower (or higher) than the current defaults. Allowing a pathway to use a site-specific factor incentivizes using new technology – such as three stage membrane systems, which have been quoted to have methane recovery of up to 99.5 percent – which allows for ongoing innovation and improved emissions outcomes. Project-specific factors will be more accurate and can be audited by the third-party verification body. Accordingly, we encourage CARB to modify the Calculator to allow for a site-specific fugitive methane rate. This will incentivize pathways to minimize methane leakage after capture by upgrading systems and increase the number of membrane stages. Therefore, on the Biogas-to-RNG tab, applicants should be able to enter the project-specific fugitive emissions rate. Further, having a value different from the default should not push a project from Tier 1 to Tier 2.

Alternatively, CARB should lower the default fugitive emission percent to 0.5 percent from 2 percent, as there are now three stage membrane and amine systems which have manufacturer guarantees of greater than 99.5% methane recovery.

Flared Biogas Due to Pathway Operations Should be Included in Avoided Emissions Boundary

Anerobic digesters are biological systems that continuously produce biogas. If a pathway's gas upgrading system ("GUS") is not operational, the anerobic digestion process does not stop and biogas is still produced. Even in cases where manure is no longer fed into an anerobic digester, it will continue to generate biogas for weeks that cannot typically be stored onsite. This is different than mechanical processes in other pathways such as liquid fuel production (e.g., biodiesel or renewable diesel), where if downtime occurs all operations stop and feedstock is stored in an onsite silo. During GUS downtime in an RNG pathway, biogas is flared prior to being sent to the GUS, reducing methane emissions, but not accounted for within the pathway boundary. Accordingly, we encourage CARB to include in the Calculator a column for raw biogas flaring due to the GUS operations or alternatively, incorporate raw biogas flaring into the *Flared biomethane including tailgas from upgrading, (metered)* column (Input 2.26) in the Calculator. The Calculator currently removes avoided methane associated with flared biogas due to plant downtime, by using an allocation factor for methane avoided (Section P2). As the biogas cannot be stored, operators are preventing emissions by capturing and destroying methane during GUS downtime but are being penalized for it. Accounting for flared biogas using one of the aforementioned methods would incentivize pathways to destroy rather than vent biogas that cannot be processed due to GUS operational downtime.

This would allow project developers to account for biogas that was captured with the intent to supply transportation fuels but was not upgraded due to operational downtime (e.g., system maintenance, equipment overalls, force majeure events) and other events outside the pathway holders control (e.g.,

biogas production changes from temperature, digester microbial health). It would also reduce biomethane CI Score fluctuations due to operational and biogas production changes outside the control of the pathway.

If biogas is generated to be used outside of the LCFS pathway process, it should continue to be captured as historically done and we would recommend changing the title of the Flared Biogas column (Input 2.6 and 2.7) to accurately describe what is being reported. However, typical biogas facilities are only producing biogas for the LCFS pathway and any resulted flared biogas is due to conditions outside of normal operations.

True Up Required to Properly Account for True Biomethane Pathway Performance

Amp supports the proposed credit true up between temporary CI and certified (e.g. provisional or non-provisional) CI values, as proposed by CARB staff, and also recommends a credit true-up between verified operational CI and certified CI values. By allowing a true up between temporary CI and certified CI values, CARB would help alleviate concerns related to pathway process delays, assist in avoiding complicated storage agreements, provide reliable deliveries to fleets by avoiding buildup of stored gas inventory, allow more direct sales of RNG to smaller local fleets, and motivate additional project development.

In addition, Amp supports a true-up based on actual verified CI data, rather than relying on the certified CI value. Dairy RNG projects produce small quantities of fuel compared to traditional refining processes, and the CI can fluctuate significantly from one year to the next due to external factors such as temperature and herd count, as well as other operational changes outside the operator's control, biogas production in the digester due to temperature or changes to the manure volatile solid content, unplanned equipment downtime, energy efficiency due to equipment age, force majeure events, changes in dairy operations (e.g., manure collection practice, water usage, dairy feed). If a pathway CI value increases, the current LCFS rules require automatic adjustments based on the annual fuel pathway report ("AFPR"), to ensure that prior provisional and non-provisional pathways avoid over-generation of credits. We propose that CARB similarly true-up pathway CI values that decline progressively to more accurately reflect the true benefits of a pathway, which may have been initially underestimated. Just as it is necessary to avoid over-counting CI credits, it is also necessary to avoid undercounting the actual greenhouse gas ("GHG") benefits of all pathways.

Please see our August 2022 Workshop comment letter for additional details.[1]

Clarify Timing of New Calculators Applicability

We request that CARB staff clarify when the new calculators are expected to be formally effective. We assume that this would occur with the effective date of the new LCFS regulation amendments, but would appreciate confirmation of that approach from CARB staff.

The effective date of the new Tier 1 calculators is crucial for all projects. We recommend that CARB permit all pathway applications deemed complete or approved by January 1, 2025 to use the existing calculator through the end of the pathway's crediting period. This will allow projects financed under the current LCFS Regulation, currently under construction, commencing operations, and/or collecting the

[1] https://www.arb.ca.gov/lists/com-attach/74-lcfs-wkshp-aug18-ws-UDEAa10sAAwDaVQ3.pdf

initial three months of operating data to operate based on regulations that were in place at the time that investment decisions were made. We also agree with and echo comments provided by the Renewable Natural Gas Coalition ("RNG Coalition") on these points.

Update Volatile Solids Removal Table A.9

Amp supports updating the Volatile Solids Removed Through Solids Separation table with new solid separation technologies that are not currently listed. CARB has reviewed multiple pathways that have solids separation equipment not listed in the table and approved operating conditions with newer state of the art equipment (e.g., Dissolved Air Flotation, Hydrocyclones) that have undergone testing with manure solids that has been approved by CARB. To simplify the use of additional solids separation and keep additional manure out of effluent ponds, technologies that have been approved by CARB should be added to the table. This will reduce the number of pathway modification applications CARB staff has to review and approve.

CLOSING

Thank you again for the opportunity to comment on the Draft Tier 1 Carbon Intensity Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure and associated Instruction Manual. We support CARB in its efforts to maintain a strong LCFS program to achieve the State's greenhouse gas goals.

Amp further supports the comment letters that the Coalition for Renewable Natural Gas ("RNG Coalition") have submitted regarding the Calculator. We look forward to continuing to work with you through this process and other related efforts to achieve these outcomes.

Sincerely,

Cassandra Farrant

Cassandra Farrant
Head of Environmental Credit Compliance
Amp Americas