

California Air Resources Board (CARB) 1001 I Street Sacramento, CA 95814

May 31, 2023

Subject: Comments on Proposed New Tier 1 Simplified Calculator for Biomethane from Anaerobic Digestion of Organic Waste

To Whom It May Concern:

Anaergia Services LLC (Anaergia) is a global leader in diverting organics from landfill-bound waste and converting them into renewable fuel and soil amendments. Based in Carlsbad, CA, Anaergia is actively deploying anaerobic digesters in California and converting landfill-diverted organic waste into carbon-negative fuels. Our Rialto Bioenergy Facility (RBF) – the largest landfill-diverted-organics-to-renewable-fuel facility in America – can process over 175,000 tons per year of diverted organics and produce 1,000,000 MMBtu/yr of biomethane. After 4 years of planning and construction with over \$180M invested, RBF is now operational and has created at least 50 permanent jobs, hundreds of construction and service jobs, and over 500,000 hours of construction work. These facilities are part of the 160 new projects that CalRecycle estimates are needed to meet California's statutory organic waste landfill diversion goals established under SB 1383 (Lara, Chapter 395, Statutes of 2016), and which are foundational for achieving carbon neutrality by no later than 2045.

Anaergia submits this letter in response to proposed new Tier 1 simplified calculator for Biomethane from Anaerobic Digestion (AD) of Organic Waste (OW), released April 28, 2023. Anaergia agrees that changes to the Tier 1 calculator are necessary to improve both the accuracy of calculated carbon intensity (CI) for biomethane from food waste, as well as LCFS program effectiveness in achieving the State's ambitious climate change and energy goals, including those codified under SB 1383. Biomethane from landfill-diverted organic waste is a critical tool in meeting the State's targets. It is essential to reduce in-state methane and greenhouse gas emissions by accelerating the development of landfill-diverted organics infrastructure, leveraging tools such as simplified Tier 1 calculator pathways for biomethane.

Anaergia appreciates CARB's recognition that landfill gas collection efficiency (GCE) is highly variable across landfills and supports addition of the site-specific landfill capture rate option in the Tier 1 calculator for Biomethane from AD of OW. In particular, we agree with CARB's acknowledgment that actual GCE may be most accurately captured via direct measurement of landfill emissions. In light of these acknowledgements, Anaergia urges CARB to implement the following changes to the calculator to further improve accuracy and utility, support biomethane markets, and encourage deployment of critical food waste AD infrastructure:

- Update default Landfill GCE to accurately reflect the latest science and encourage biomethane from OW
- Simplify the determination of the Tier 1 calculator site-specific GCE
- Streamline OW feedstock definitions
- Include default co-product credits for the benefits of displaced fertilizer



Update default Landfill GCE to accurately reflect the latest science and encourage biomethane from OW

The LCFS Program has consistently presented on the importance to update aspects of the LCFS program to "reflect evolutions in technological performance and data availability.¹" One key area in which there has been a significant update to data availability is that of fugitive methane emissions from landfills. This is reflected in the new Tier 1 calculator's inclusion of an option for site-specific GCE as determined by direct measurement of landfill emissions. However, this acknowledgment is not similarly reflected in the default GCE itself. Currently, the draft Tier 1 calculator assumes a GCE of 75%, based on a stipulated assumption from a 1997 US EPA study. This value, which the EPA study itself identifies as a placeholder value in the absence of more data, has been repeatedly shown to be a severe underestimate by more recent work leveraging advanced data collection methodology in California, the US, and worldwide.

A 2019 study by NASA JPL estimates that landfills' contribution to the state's methane emissions is double current estimates – approximately 41% of all methane point source emissions in California.² This conclusion is supported by a report published by the Maryland Department of Energy finding that emissions from landfills were "four times greater" than previous estimates and were the leading source of methane emissions (37%) in the state.³ The updated estimates were facilitated by the use of direct measurements instead of models. The NASA JPL study, in particular, deployed specialized airborne imaging spectrometers attached to drones, which could rapidly map methane plumes.⁴ Deploying this remote sensing technology significantly improved the determination of methane emissions associated with landfills.

Further, in February 2023, the EPA issued a proposed consent decree to re-evaluate landfill emissions factors for constituents including methane and proposes to issue revised emissions factors by 2024. This action by the EPA is in acknowledgement of a suit demonstrating that the outdated emissions factors currently in use consistently underestimate fugitive emissions such as methane from landfill.

It is critical that CARB utilize the improved monitoring techniques to inform and update the default landfill GCE. We strongly urge CARB to update its 75% methane landfill capture assumption in the LCFS Tier 1 Calculator to reflect this latest monitoring data, which clearly demonstrate that landfill GCE in use in the State and nationally are well below the current default assumption. Updating the fugitive methane emission factor will more accurately reflect the avoided carbon emissions associated from biomethane produced from anaerobic digestion of landfill-diverted organic waste. A more accurate CI score for biomethane from organic waste digestion will facilitate the financing of such facilities and accelerate the deployment of additional anaerobic digesters throughout the State to act as outlets for landfill-diverted organics. This in turn can help the state achieve its goals to reduce Short-Lived Climate Pollutant (SLCP) emissions, per SB1383. Ultimately, this simple calculator update to reflect the latest landfill monitoring techniques and data can have an outsized impact on minimizing fugitive emissions of SLCP at landfills.

Neglecting to update the Tier 1 default GCE will result in the continued undervaluation of biomethane from organic waste and severely dampened investment in critical climate mitigating AD infrastructure such as

¹ https://ww2.arb.ca.gov/sites/default/files/2021-12/LCFS%2012_7%20Workshop%20Presentation.pdf

² Duren, R.M., Thorpe, A.K., Foster, K.T. *et al.* California's methane super-emitters. *Nature* **575**, 180–184 (2019). https://doi.org/10.1038/s41586-019-1720-3

 $[\]label{eq:linear} {}^3\ https://environmentalintegrity.org/wp-content/uploads/2021/06/MD-Landfill-Methane-Report-6.9.2021-unembargoed_with-Attachments.pdf$

⁴ Duren, R.M., Thorpe, A.K., Foster, K.T. *et al.* California's methane super-emitters. *Nature* **575**, 180–184 (2019). https://doi.org/10.1038/s41586-019-1720-3



RBF. The CI of biomethane from food waste as calculated through the Tier 1 calculator is a powerful tool as a market signal to encourage investment and advance California climate goals; however, its efficacy thoroughly depends on its accuracy. Correcting the default GCE will incentivize investment in food waste diversion infrastructure and establish a strong pipeline of cost-effective, carbon-negative biomethane generation to support LCFS as well as Statewide goals.

Simplify the determination of the Tier 1 calculator site-specific GCE

Anaergia commends CARB for the addition of a site-specific landfill GCE option under the new Tier 1 calculator. This is a critical mechanism to incorporate the latest data on landfill emissions into the Tier 1 calculator and LCFS program overall.

However, the draft requirements to establish a site-specific GCE are overly burdensome and do not align with current CARB methods. The proposed approach introduces excessive technical, financial, and schedule risk for individual developers, in an industry already subject to slow ramp up of diverted OW feedstock, artificially undervalued biomethane, and onerous State requirements. Anaergia recommends several adjustments to the procedures to establish a site-specific GCE to improve Tier 1 calculator utility and encourage development of essential OW AD infrastructure.

As drafted, site-specific GCE will require at least one year of direct measurement of fugitive methane emissions at the specified landfill, plus annual updates. This represents a significant cost to developers and significantly extends project development timelines, which are already protracted for in-State projects given California regulations. Such data collection requires specialized expertise, as well as participation of relevant landfill stakeholders. Landfill owner cooperation is likely to be limited – particularly as data is currently proposed to be made publicly available. Further, the potential for variability (specifically, variability which is outside of developer control) in GCE and therefore CI score and associated biomethane value introduces significant revenue risk and negatively impacts project financeability. An annual update requirement stands directly in contrast to current CARB methods.

Rather than annually monitor the specified landfill, Anaergia recommends that the calculator include a feature to readily modify the default landfill GCE to account for whether the landfill is active or inactive. As the majority of putrescible organics degrade and emit methane from the open face of active landfills, the site-specific GCE for active landfills may be automatically reduced to account for increased emissions from these particular landfills (vs. the reduced emissions from inactive, closed landfills currently captured in the default Landfill GCE). This straightforward feature would best enable the calculator to serve exactly its purpose in advancing OW AD development: to efficiently customize to project-specific conditions without the significant additional data collection or review burden on developers and CARB staff alike, as would be required for ongoing direct landfill measurement.

To accomplish this, the above-referenced growing body of reliable methane emissions data offers a valuable resource in determining landfill capture rates for open vs. closed landfills, as an alternative to ongoing direct measurement. Anaergia recommends that applicable published, peer-reviewed data – specifically the 2019 direct measurement dataset compiled by NASA JPL – be deemed eligible for consideration by CARB to determine this modified "site-specific" GCE. Such data sets more accurately capture GCE than current default GCE values, as they are more recent and collected through more advanced measurement techniques and methodologies.



Streamline feedstock definitions

Similarly, to fully realize the benefits of a simplified Tier 1 calculator, we encourage CARB to streamline the categorization of OW feedstocks. Additional clarity is needed both with respect to (1) the definitions and differentiators between Food Scraps and Other Organic Waste (OOW) and (2) suitable methodologies for characterizing and reporting on OOW. The proposed additional requirements for characterizing OOW place stand to place further undue record-keeping burden on sorely needed industry; create uncertainty which will negatively impact investment by developers and financiers; and reduce utility of the Tier 1 calculator, likely encouraging OOW projects to forego the Tier 1 pathway in lieu of Tier 2 pathways, extending timelines to deploy essential AD infrastructure.

Include default co-product credits for the benefits of displaced fertilizer

The development of AD facilities to process diverted organics increases opportunities to offset the production and use of emission-intensive synthetic fertilizer with digestate-derived fertilizer products. We recommend that the calculator be updated to recognize the greenhouse gas emissions benefits of nitrogen, phosphorus and potassium (NPK) as well as fixed carbon of the digestate material.

Co-product credits for digestate/compost have previously been granted by CARB based on the amount of synthetic fertilizer displaced.⁵ Further, SB1383 mandates that digestate from food waste AD be land applied (i.e., rather than landfilled). Therefore, it can be taken as fact that the soil amendment from AD of OW is offsetting fertilizer consumption. Given this, we recommend CARB reestablish this important co-product credit as a default in the Tier 1 Calculator.

Conclusion

Climate change is a grave threat to our environment and our economy. California has set an ambitious climate strategy and laws to reduce greenhouse gas emissions. Implementing the above recommendations can support the development of robust supply of in-state, carbon-negative biomethane, helping to achieve the State's targeted reductions in SLCP emissions and encouraging in-state economic development. In particular, maintaining consistency between LCFS, the latest science, federal guidance, and other California climate policy will enhance inter-program synergies and serve to better support achievement of climate goals across the board. We deeply appreciate your leadership in mitigating climate change and hope that our comments will help to make these excellent programs work even better moving forward.

Respectfully,

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⁵ <u>https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/t2n-1248_summary.pdf</u>