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February 20, 2024

The Honorable Steven S. Cliff

Executive Officer

California Air Resources Board

Sacramento, CA 95814

Re: Proposed Amendments to the Low Carbon Fuel Standard Regulation

Dear Executive Officer Cliff,

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 renewable natural gas (RNG). After 4 years of planning and construction with over \$180M invested, RBF is 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). A strong LCFS program is critical for the long-term success of RBF and is foundational to continued investment in development and expansion of similar critical infrastructure, which are foundational for achieving carbon neutrality by no later than 2045.

Biomethane, including biomethane from landfill-diverted organic waste, is a critical tool in meeting the State's targets, and it is essential that biomethane production within the State is not only supported but increased to achieve the necessary methane and carbon dioxide reductions most rapidly and most cost-effectively. Anaergia is heartened at the success to date of the LCFS in advancing biomethane production in the State and nationwide, in part through the adoption of similar programs which build on California's. However, we urge CARB to consider the below strategies preserve and accelerate progress made to date towards the State's and LCFS program's ambitious carbon intensity reduction goals.

Increase Near-Term Carbon Intensity (CI) Reduction Targets

We are supportive of CARB's proposed carbon intensity (CI) reduction targets. However, we encourage even more ambitious near-term targets to match statewide greenhouse gas reduction target codified in SB 32 (Pavley, Chapter 249, Statutes of 2016). While we are supportive of the increased 2045 carbon intensity target, emissions reduction in the near-term is most critical to avoid runaway climate change and its most harmful effects. We have seen the success of the LCFS in driving rapid transition towards renewables and decarbonization in the transportation industry. As California's largest source of emissions, the transportation sector must play a leading role in achieving the State's climate change and air quality objectives. Therefore, carbon intensity targets under the LCFS should be no less than statewide greenhouse gas reduction targets. Adopting higher near-term LCFS carbon intensity reduction targets of at least 40% will not only drive progress towards long-term Statewide climate goals; this change will also incentivize

near-term achievement of emissions reductions, especially in the transportation sector and communities where they are needed most, providing additional runway to mitigate and reverse climate change. Anaergia encourages CARB to **adopt a more aggressive 2030 CI reduction target (40-55%) to be consistent with SB 32**. It is not the time to set manageable goals and to delay more significant reductions; rather, we must make leaps in carbon emissions reductions to secure additional runway to mitigate and reverse climate change.

Maintain Avoided Methane Crediting Beyond 2040

Anaergia urges the LCFS to maintain consistency with other California climate programs and with the LCFS itself. Of critical importance maintaining the GREET-based lifecycle approach to emissions accounting for biomethane, which is currently accurately employed for all other eligible LCFS fuels. Eliminating avoided methane crediting for only biomethane would represent a singular and premature change in accounting. Further, this change would contradict the program's design and objectives, the established GREET model, accepted science, and California's progress towards SLCP emissions reductions goals.

There are numerous avenues to achieve SB 1383 compliance, not all of which are equal from an emissions perspective. A particularly important tool is anaerobic digestion (AD) of landfill-diverted organics to generate biomethane, which results in greater methane emissions reductions than composting organic waste, while also generating RNG to reduce fossil fuel use. On balance, with the increased climate benefit of AD, these complex facilities are more expensive to construct and operate, especially in California. Investment and sustainable operation of organic waste digesters relies on adequate revenue generation through the project lifecycle, primarily through biomethane sales. With facility lifespans in excess of 20 years, eliminating avoided methane crediting – even as soon as 2040 – negatively impacts revenue available to finance these capital-intensive facilities. The resulting major reductions in expected revenue will halt investment and therefore the SLCP reduction potential of projects in operation and development today. These complex facilities are not financeable without long-term (20+ year) avoided methane crediting, especially as no other equivalent program has yet been established to appropriately incentivize biomethane uptake.

The full lifecycle benefits of AD must be accounted for via appropriate methane crediting and biomethane valuation to promote organic waste digesters and achieve SLCP reductions goals. Currently, it is clear that California-generated biomethane from organic waste does **not** have a market value reflective of its real-life climate benefits, nor sufficient to garner the needed investment: CalRecycle estimates over 100 such facilities are needed in California to accommodate the 20 million tons per year of organics that must be diverted from landfill per SB1383; however, RBF is the only such food waste digester currently operating in the State. (This is compounded by the near-term lack of deliverability requirements.) The premature and arbitrary elimination of biomethane crediting will further disincentivize development of this effective methane reduction strategy in two ways: first, by devaluing biomethane and negatively impacting project economics; and second, by creating uncertainty in the market and thereby reducing investor confidence and financeability. In short, changing the approach to avoided methane crediting in the LCFS will jeopardize the State's ability to meet its SLCP reduction goals and to develop additional biomethane supplies necessary to achieve carbon neutrality.

Maintaining credits for avoided methane emissions beyond 2040 is absolutely essential to the continued operations of existing facilities generating biomethane from landfill-diverted organics, the

development of and investment in additional similar facilities, and ultimately the achievement of SB 1383, SB 32, and AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022). Eliminating avoided methane credits will irreparably damage the industries sorely needed to achieve the State’s highest priority climate goals.

Update Tier 1 Calculator for Food Waste Biomethane to Reflect Latest Science on GCE

Part and parcel with maintaining avoided methane crediting is ensuring the Tier 1 simplified calculator for Biomethane from Anaerobic Digestion (AD) of Organic Waste (OW) accurately quantifies the carbon intensity of biomethane from landfill-diverted organics. 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 Anaergia commends CARB for updating the calculator in recognition of fugitive methane emissions from landfills’ open face and the negligible gas collection efficiency (GCE) within the first few years of disposal of organics in landfill. However, more changes to the calculator’s default assumptions are necessary to match the latest science, including recent US EPA findings published in October 2023.

Currently, the calculator assumes that 75% of methane emissions from organics in landfill is captured starting at Year 4, 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. In exceptional alignment with these studies, in October 2023, EPA published its findings that 61% of methane generated by food waste in landfill is emitted to atmosphere (i.e., a GCE of only 39%).

With CARB’s endorsement of EPA as standard-bearer for capture rate, this EPA-quantified value should immediately replace a previous, outdated estimate. It is critical that CARB utilize the findings of improved monitoring and analysis techniques from the last quarter-century 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 EPA-published value**, which clearly affirms that landfill GCE in use at the State and national levels 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

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>

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>

accurate CI score for biomethane from organic waste digestion will accelerate the deployment of anaerobic digestion throughout the State for landfill-diverted organics. This in turn can help the state achieve its goals to reduce 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 correct the Tier 1 default GCE will result in the continued undervaluation of biomethane from organic waste and severely dampened investment in critical climate mitigating infrastructure.

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. Maintaining and improving LCFS is essential to support the development of a 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, avoided methane crediting is a powerful tool as a market signal to encourage investment and advance California climate goals – and its efficacy hinges on its correct CI determination through GREET. Updates to LCFS that enable the most accurate avoided methane crediting on a lifecycle basis will incentivize investment in food waste diversion infrastructure in California – where its benefit is most keenly felt – and establish a strong pipeline of cost-effective, carbon-negative biomethane generation to support both the transportation sector under LCFS and ultimately non-transportation sectors as well.

We deeply appreciate your leadership in mitigating climate change and hope that our comments will help to make these excellent programs work even better in the future.

Respectfully,



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