August 3, 2022

Re: Michigan Renewable Natural Gas Study Draft Report and Stakeholder Meeting #3

To Whom It May Concern,

Anaergia Services, LLC (Anaergia) submits these comments on the Michigan Renewable Natural Gas (RNG) Study Draft Report.

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 the largest installed anaerobic digestion capacity in California converting landfill diverted organic waste into carbon-negative fuels. Our Rialto Bioenergy Facility (RBF) – the largest landfill diverted organics to renewable facility in California – can process over 175,000 tons per year of diverted organics and produce 1,000,000 MMBtu/yr of RNG. After four years of planning and construction with over $180M invested, RBF has been operating since Fall 2020 and has created at least 50 permanent jobs, hundreds of construction and service jobs, and over 500,000 hours of construction work. Anaergia, in partnership with the Victorville Wastewater Reclamation Authority, opened a new facility earlier this year leveraging existing wastewater treatment infrastructure to convert organic waste and sewage sludge into biomethane and is capable of producing 300,000 MMBTU/yr. Anaergia is currently partnering with Kent County, Michigan, to develop the Kent County Sustainable Business Park, which will divert organic waste from 400,00 tons per year of landfill-bound municipal solid waste to generate 600,000 MMBTU/yr of carbon-negative RNG.

Anaergia submits this letter as the Michigan Public Service Commission (MPSC) continues to prepare and finalize the Michigan RNG Study and Feedstock Inventory. Anaergia appreciates MPSC's ambitious and foundational work to evaluate RNG production potential in Michigan. This study will help to support the development and deployment of this critical climate change mitigation resource in Michigan. Anaergia strongly supports a continued focus on methane reductions as the most significant opportunity to reduce climate change in the near-term.

In particular, we would like to highlight the following items regarding the study:

i. Landfill-diverted food waste is a major feedstock source for cost-effective RNG
ii. Organics separation can improve economics for MSW feedstock
iii. Abatement cost methodology appropriately captures critical and unique role of RNG in climate change mitigation
iv. Accurate greenhouse gas emissions accounting must consider lifecycle fugitive landfill emissions
v. WRRF RNG production is cost-effective, and supported by co-digestion
vi. RNG market development should be evaluated and prioritized

Thank you for your consideration of these comments.

i. Landfill-diverted food waste is a major feedstock source for cost-effective RNG

Landfill-diverted food waste is a major source of organic feedstock for carbon-negative renewable natural gas (RNG) from anaerobic digestion (AD). Food waste represents a large portion of landfilled waste, often

around 30% or more. Therefore, the organic fraction of municipal solid waste (OFMSW) from landfills represents a significant, reliable, and energy-dense feedstock source to generate RNG. The resource potential of food waste far exceeds capacity of existing alternative end uses of the feedstock, such as compost.

Anaergia's Organics Extrusion (OREX) line can recover ~90% of putrescible organics from municipal solid waste, accessing feedstock in even the most challenging waste streams. Importantly, this waste separation technology can recover organics from residential, multi-family, and commercial municipal solid waste streams in addition to typical institutional and industrial sources. **This commercially proven technology and associated recovery rates should be accounted for when defining technical, achievable, and feasible supply scenarios of resource potential for AD of OFMSW.** In particular, the proven ability to capture food waste from residential MSW should be accounted for by increasing achievable and feasible diversion rates.

AD of OFMSW reduces fugitive methane emissions from landfills and offers a lower abatement cost (i.e., improved cost effectiveness) by preventing greater methane emissions than landfill gas or food waste AD alone. RNG derived from OFMSW or landfill-diverted organics is carbon negative (as demonstrated in the CA GREET model). Significantly increasing **generation of carbon-negative RNG from OFMSW feedstock will drive meaningful progress towards deep decarbonization and the State's carbon neutrality goals**, beyond what is achievable through more carbon intense RNG derived from other identified feedstock sources considered as part of the inventory (e.g., landfill gas) and alternative food waste end uses such as compost.

ii. Organics separation can improve economics for MSW feedstock

Anaergia's OREX can provide organics recovery for greater volumes of MSW. As a result, availability of MSW feedstock for gasification (as identified in the study) may also be increased and therefore reduce gasification LCOE. As LCOE for AD is generally lower than for gasification, MSW separation and AD of OFMSW can reduce overall cost for processing MSW, versus gasification of the entire waste stream.

iii. Abatement cost methodology appropriately captures critical and unique role of RNG in climate change mitigation

Anaergia supports the use of greenhouse gas abatement cost to assess RNG cost-effectiveness. We agree that relative magnitude of the **RNG abatement cost accurately reflects the unique value and critical role of RNG in mitigating climate change** through the reduction of fugitive methane emissions. However, the deployment of RNG should be viewed as complementary to other greenhouse gas abatement measures. The abatement cost metric should not be employed as a standalone competitive analysis of abatement measures.

iv. Accurate greenhouse gas emissions accounting must consider lifecycle fugitive landfill emissions

Accurately quantifying the carbon intensity of RNG will support appropriate monetization of the environmental benefits and therefore bolster RNG development and deployment. **Rather than the proposed combustion approach, lifecycle accounting methodology most accurately captures the emissions reduction potential and value of various feedstocks**.

In employing a lifecycle accounting methodology, the rate of landfill methane capture is central to quantifying carbon intensity for food waste. **The methodology should reflect the latest research on methane emissions from landfill**, which demonstrates that fugitive methane emissions from landfill are significantly higher, and landfill capture much lower, than historically assumed. In particular, a 2019 study by the NASA JPL

estimates that landfills' contribution to the state's methane inventory is double current estimates – approximately 41% of all point source emissions in California[1]. **The negative CI of RNG from landfill-diverted food waste should reflect the full extent of emissions prevention form landfill**.

v. WRRF RNG production is cost-effective, and supported by co-digestion

Wastewater resource recovery facilities (WRRFs) can provide significant opportunity for RNG generation by leveraging existing AD infrastructure. However, due to high fixed costs associated with biogas upgrading and pipeline interconnection, WRRF RNG is typically only implemented at WRRFs producing biogas at sufficient scale. **It is inaccurate and misleading to report the high-end LCOE of WRRF RNG based on smaller WRRFs where RNG would not typically be implemented**.

Co-digestion offers an opportunity to achieve or improve the necessary economies of scale for biogas production at WRRFs. Excess AD capacity for additional feedstock may be existing or achieved through low-cost digester retrofits, such as Anaergia's Omnivore™ high-solids digestion platform. As a result, AD infrastructure may be employed to digest feedstock beyond municipal biosolids. Food waste (including source separated, landfill-diverted, and commercial processing waste) is suitable for co-digestion at municipal WRRFs, and often lacks alternative AD outlets. Co-digestion increases WRRF RNG production potential by providing AD for additional feedstocks and producing more biogas overall. Further, co-digestion makes RNG enables smaller WRRFs to achieve the necessary scale for RNG production to be favorable. **Co-digestion at WRRF should be encouraged to increase overall RNG production potential and cost-effectiveness.**

Anaergia agrees that there is untapped potential for RNG production at WRRF without existing AD. Anaergia's Omnivore system supports reduced capital costs and delivery timelines for new digester construction, enabling cost-effective and expeditious RNG deployment. New AD development intended to increase RNG production should include assessment of facility size, local feedstocks, and gas pipeline proximity for offtake.

vi. RNG market development should be evaluated and prioritized

Understanding it is outside the scope of the study, **the establishment of RNG markets is essential to support investment in and development of RNG-generating projects**. Anaergia encourages the PSC to continue evaluating and implementing policies to support RNG procurement and offtake. Key opportunities include mechanisms for utilities to procure RNG, including expanded voluntary RNG procurement programs and renewable gas procurement standards (such as California's SB1440). While DTE currently offers voluntary RNG program, increasing RNG caps will expand opportunity.

[1] Duren, R.M., Thorpe, A.K., Foster, K.T. et al. California's methane super-emitters. Nature575, 180–184 (2019). https://doi.org/10.1038/s41586-019-1720-3