July 10, 2023

Ms. Cheryl Laskowski, Chief
Transportation Fuels Branch
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Ms. Laskowski:

W2e provides services and products for renewable energy technology development, from small-scale research through full commercial deployment. W2e also specializes in innovative Waste to Energy solutions, with an emphasis on emerging technologies. W2e is currently developing manure-to-fuel technologies which are far more efficient and less emissions intensive than traditional digester projects which unfortanutaly penalizes W2e within the current CARB model. The W2e process is more efficient from two primary standpoints. The first involves processing nearly 100% of the produced manure from a dairy, where as traditional digesters utilize only a fraction of approximately 50%. The second point regarding the W2e process efficiency relates to the RNG production of 7 to 10 mmBtu/tonne of manure processed where as traditional digesters generate only 4 to 5 mmBtu/tonne processed.

We appreciate and support CARB's continued efforts in decarbonization through the LCFS program including continued support for the decarbonization of the dairy industry. We also appreciate the multiple aesthetic and functional upgrades to the "Biomethane from Anaerobic Digestion of Dairy and Swine Manure" calculator (manure calculator). However, W2e is concerned with the new requirement that an annual lagoon cleanout baseline be modeled whether or not a cleanout was performed in the past.[1] This replaces a user-defined input based on real-world data with an overly conservative assumption and hurts those projects that have the greatest methane-reduction benefit to the environment. This particularly hurts innovative technologies such as W2e's, which require maximum credit value in order to implement. The previous set of instructions functioned well and many of these types of projects have been validated and verified in the past several years, including this user-defined input. We request additional clarification from CARB as to why this change was necessary, and respectfully ask CARB to reconsider this adjustment.

Further, W2e requests that CARB consider making the manure calculator more technology-neutral. W2e is developing alternate methods of manure processing which avoid many of the drawbacks, including leakage, brought to CARB's attention throughout the rulemaking process. However, as it stands it is difficult to implement our process into this calculator given that the calculator is very much digester-technology specific, forcing the larger GREET-4.0 model to be used. We would request additional technology options beyond "Enclosed Vessel" and "Covered Lagoon"; ideally this would be a user-defined technology. This would greatly simplify the modeling of emerging technologies as well as making CARB review/verification much more straightforward. In addition, utilizing an analysis that considers all of the dairy manure output instead of just a portion of the manure would give a more clear picture of overall effectiveness regarding GHG emissions.

Finally, W2e requests for CARB to consider updates to table A.4 (VS rates by state) using the latest data available. We understand that these assumptions are based on the Compliance Offset Protocol for Livestock

[1] Introduction tab: "Annual lagoon cleanout in September each year is required for the baseline modeling (Fields L1.(1-6).14)."

Projects which was last updated nearly a decade ago, and that these assumptions are outdated. We believe that CARB should either update these VS rates based on the latest data available or allow user flexibility to update additional emission factors, particularly if the project operator can provide supporting data through actual data monitoring and/or laboratory analysis. We note that LCFS already allows this for liquid fuels when it comes to feedstock processing. While we understand that this change will require additional staff review time during the fuel pathway application process, we believe it is important to keep the regulatory framework flexible to accurately account for GHG reductions and realize the full value of the project.

We appreciate all the work that CARB has put into the LCFS regulatory update process and CI calculators thus far. Should you have any questions, please contact me at Daren E. Daugaard, PhD, PE dd@burningoakenergy.com; 580-761-0891

Sincerely,

Daren E. Daugaard, PhD, PE
W2e Owner's Engineer Consultant
Burning Oak Energy LLC