



December 21, 2022

VIA ELECTRONIC FILING

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

Re: Low Carbon Fuel Standard November 2022 Workshop

Dear Dr. Laskowski:

Generate Capital, a Public Benefit Corporation, is a leading sustainable infrastructure company driving the infrastructure revolution. Generate builds, owns, operates and finances infrastructure solutions for clean energy, water, waste and transportation. Founded in 2014, Generate partners with over 40 technology and project developers and owns and operates more than 2,000 assets globally. Generate offers leading developers and technology pioneers of the infrastructure revolution tailored funding and support needed to build projects. Our Infrastructure-as-a-Service model delivers affordable, reliable and sustainable resources to over 2,000 customers, companies, communities, school districts and universities.

Our work that is relevant to the LCFS includes financing electric bus fleets, financing EV charging infrastructure, and owning and operating anaerobic digesters (ADs) that produce electricity and/or RNG. Generate operates six food waste AD sites in North America. We do not have a food waste AD development site in California at this time due to the difficulty finding sites, and due to the permitting timeline and associated costs. We look forward to working with the California Air Resources Board (CARB) and other key agencies to work through these challenges to accelerate our collective work to address the climate crisis.

Generate appreciates the opportunity to submit comments to CARB in response to the Low Carbon Fuel Standard (LCFS) workshop held on November 9, 2022 (the Workshop). As an investor in, and owner/operator of clean energy infrastructure, we state unequivocally that the LCFS program has been a key factor in our clean transportation related investments, and a critical enabler of large-scale, long-term investments in a host of climate solutions for the transportation sector and beyond. We appreciate CARB's commitment to continuous improvement of the underlying regulatory framework.

Below we share some insights from our many years of experience as one of the nation's largest food waste recycling infrastructure owner/operators, as well as investment professionals in the climate space. We also share some key concerns relating to some of the proposals brought forward at the LCFS workshop in November.

Our key messages to CARB are:

- At the program level we believe new targets of 30% by 2030, spurred by a starting point of 19% in 2024 should be adopted. In this we fully endorse the comments submitted by Asher Goldman (a former member of our team) which also include recommendations for enhancements in program design, including importantly an automatic ratchet mechanism.
- Policy driven markets fail if regulators create investment uncertainty through “stroke of the pen” risk. In this we align with, and endorse, the comments of the RNG Coalition. Complex food waste digestion projects in California can take four years or more to develop (site control, permits, construction, commissioning, etc.). In other words, it takes half a decade just to get up and running and then many years more to pay back the upfront investment. These inherently long timelines require long line of sight, and high levels of investor confidence, to unlock the needed scale of capital.
- Generate would like to underscore the points made by the RNG Coalition in the comments about the need to promote a harmonized market for RNG and that avoided methane crediting should continue in LCFS unless and until a realistic and proven replacement strategy is implemented.
- As it relates to food waste anaerobic digestion projects, it is critically important that lengthy delays and lack of transparency in permitting processes be addressed if California is to be able to meet its climate targets. To enable the buildout of organic waste recycling infrastructure in California, CARB must work in concert with other relevant agencies to address the code and permitting factors that currently result in unnecessarily long lead times, elevated costs, and uncertainty involved in developing food waste ADs and composting facilities.
- Critical to the establishment of effective policy is the understanding that not all digester facilities are the same and that digesters can have radically different designs, operating complexity, and biogas production expectations depending on what type of feedstock they use (e.g. animal manure, wastewater treatment plant (WWTP) wastewater, or food waste). These differences lead to dramatically different construction design, cost to build, and cost to operate over time. We believe that expectations around food waste AD derived RNG supply do not account for the permitting nor business development challenges faced by the industry.

I. Differentiation Among Digester Types – Feedstocks, Locations, Business Models

Digesters can have radically different designs, operating complexity, and biogas production expectations depending on what type of feedstock they use (e.g. animal manure, WWTP wastewater, food waste). These differences lead to divergent revenue profiles as well as costs to build and operate. These dramatic differences are not currently reflected in CARB’s, or other agencies’, expectations of future project numbers and RNG supply therefrom.

To illustrate these differences concretely, and how these important differences impact CARB decisions, below we compare food waste AD to dairy manure AD projects. We explain key differences and why development in California is particularly difficult, even for experienced operators.

Food Waste is Highly Diverse

Food waste is not homogenous as the standard categorization of it alongside “manure” and “wastewater”, both generally homogenous waste streams, may suggest. Generate Capital characterizes food waste in five major categories as follows: fats oils and grease (FOGs), liquids, solids, packaged, and source separated organics (SSO). Each one of these categories can further be subdivided based on the characteristics of individual waste streams (solids content, biological oxygen demand (BoD), chemical oxygen demand (CoD), energy potential, packaging, delivery method (loose, tote, gaylord, etc.), and contamination rate) to make up what we call their “materials handling” and “contribution margin” profiles. It is not uncommon for a food waste digester to have dozens of feedstock customers, a fact in itself which requires an organizational infrastructure akin to a small business.

The complexity of each general category of food waste drives the equipment needed to process each type of food waste, and thus drives:

- the design of the project,
- required permits, and
- capex.

Packaged waste and SSO for example require significant tip floor space, high ceiling buildings for internal truck tipping, specialized de-packaging equipment to separate the organics from the packaging, and significant labor and preventative maintenance costs. This is all for materials handling prior to waste even entering the digester.

It is important to note that the above description of “food waste” compares to manures or WWTP wastewater which are generally liquid, pumpable, and easy to manage from a materials handling perspective.

Further, each one of these food waste types is part of a competitive waste disposal market. For example, liquid waste can go to:

- wastewater treatment plants, or
- compost facilities, or
- landfills, or
- be land applied.

Some of these options can be far less expensive for liquid food waste generators and thus more appealing. Packaged waste and SSO have fewer available outlets and can attract higher tip fees as a result, but require more space, labor and equipment to manage.

In general, we believe any new facility in California will need to be able to process all of the forms of food waste mentioned above in order to be commercially successful. This means new projects will require a site that:

- is capable of receiving 50-100 truckloads per day of waste delivery, and
- has tipping floors capable of receiving packaged waste and SSO, and
- has de-packaging equipment capable of processing packaged waste and SSO, and
- has liquids receiving infrastructure.

Location, Location, Location

The feedstock types and procurement potential will drive site selection for any AD facility. Site procurement for a food waste digester is a multi-faceted challenge with a multi-year timeline and often a multimillion-dollar cost. A key difference to note is that food waste projects are generally not host site projects; meaning that they do not get their feedstock from one site on which they are co-located. They are typically standalone facilities that need to attract waste from a watershed, typically 200 miles or 2-3 hours driving radius for waste haulers. As such, their location needs to be in an attractive watershed, limiting the options for attractive available land, and generally meaning that the land will be more expensive as it needs to be relatively close to industrial and population centers.

Digestate

Another key difference relates to digestate management. While all digesters have to find beneficial uses for digestate (the liquid nutrient product remaining after digestion), here again food waste digesters are different. On a dairy AD site this liquid is land applied. For food waste digesters, digestate can be land applied or sewer disposed but both options are very expensive and therefore, digestate management is often the single largest expense line item for a food waste digester. The digestate can be dewatered and made into more refined fertilizer products, but these products generally do not sell for a high value (because they are not typically certified OMRI organic) and the equipment required is very expensive, both in terms of CAPEX and OPEX.

Zoning and Permitting

All of this design and operational complexity translates into the second major roadblock for project design which is permitting. Permitting for food waste projects requires waste handling permits, for the various types of waste that form “food waste”, as well as environmental permits (for performing AD, composting, digestate application), and energy related permits (for operating an RNG facility) not to mention civil concerns such as truck traffic approvals. The process for obtaining any one of these is lengthy, let alone all of them at once.

For food waste anaerobic digesters, the process starts with zoning. This type of AD is typically zoned industrial and generally requires a conditional use permit from the relevant municipality. These are binary permits (yes/no) and can sometimes require public hearings/consultations very early in the development process. However, they generally do not include a process to address any concerns the zoning body may have with the applicant before denying a permit.

Second is the CEQA process which takes two to three years and costs several million dollars. This is also a binary (yes/no) process with no visibility into decision making, or ability to make adjustments, before the yes/no determination.

Next, prospective AD developers go to the Regional Water Quality Boards to ensure that the proposed AD facility will not negatively impact the local watershed. It is unclear how AD fits in with the current regulatory structure of the regional water quality boards.

Then developers must get permits from the relevant Air Quality District. Stringency varies depending on location within California. Large metropolitan areas, where the majority of the food waste is concentrated, are generally the strictest. Some air quality districts’ current regulatory requirements essentially render AD development impossible.



There are additional safety permits and other code related issues, but the above covers the major code and permitting factors that relate to long lead times, elevated costs, and uncertainty involved in developing food waste ADs.

The above permitting challenges are in dramatic contrast with those of dairy manure AD projects where permitting is addressed relatively easily through existing CAFO permits with minor modifications.

Workforce – The Specialized Skillsets Necessary Are In Short Supply

An additional key limiting factor to the speed at which food waste AD can be expanded is the skilled workforce required. Food waste ADs are more complicated to operate, and these specialized skillsets are not readily available today. Due to the elevated development risks, and higher capex and operating costs, there are fewer developers focused on food waste AD than dairy AD, and in general there is a smaller professional pool of talent to build out the segment of the industry.

II. The greater complexity of food waste AD projects means that they cannot readily fill the gap that would be left if dairy RNG and/or Eastern RNG were excluded from the LCFS.

With regard to the proposal at the November workshop that indicated a belief that excluding some current RNG sources from the California LCFS market may result in significant additional in-state food waste RNG development, we disagree based on all of the reasons we've outlined above.

Given the inherent difficulties in rapidly scaling up food waste ADs, and given the urgent need for methane reduction to address climate change, it does not make sense to advance policy that would slow down AD development of any type.