January 3, 2022

To: California Air Resource Board

From: Evan Edgar, Principal Civil Engineer

RE: CARB's Low Carbon Fuel Standard Potential Regulation Amendment
Carbon Intensity Status for Food Scraps and Urban Landscaping Waste at High-Solids Anaerobic Digestion (HSAD) Facilities

The 2018 Amendments to CARB's Low Carbon Fuel Standard (LCFS) added the carbon intensity (CI) for Biomethane CNG from Food Scraps and Urban Landscaping Waste. The Temporary Pathway for Indeterminate CIs for Biomethane CNG for these organics is published at plus 45 and needs to be removed from the LCFS regulations as soon as possible. CARB staff have acknowledged that the plus 45 CI is based upon wastewater treatment CIs, increase by a percentage amount to be conservative, and do not reflect HSAD. The plus 45 CI is not reflective of HSADs that have determined their CI which have been approved by CARB. The CIs from HSAD facilities are no longer considered to be 'Indeterminate' since the CIs have been determined. This is a blatant move by CARGB staff to bias carbon negative CI from HSAD that can be used as renewable natural gas (RNG) in heavy-duty vehicles in favor of electrification.

These are the same comments we filed back on October 15, 2020, during a LCFS regulatory workshop. It is an important now as ever since CARB staff says that the LCFS will not be revised until 2024. Leaving the current LCFS regulations and CIs in place until then is unacceptable since it is not based upon science, and recent design-based pathways for HSAD have been adopted which provided Cis that are carbon negative. This action by CARB couped with electrification has chilled the entire HSAD industry.

Table 8. Temporary Pathways for Fuels with Indeterminate CIs

Biomethane CNG	Municipal Wastewater sludge, Food Scraps, Urban Landscaping Waste, or Other Organic Waste	Grid electricity, natural gas, and/or parasitic load	45

On December 15, 2014, CARB filed a Staff Report that determined the CI of high solids anaerobic digestion (HSAD) to be minus 15.29, based upon theoretical information available at the time for this generic technology provider in which Edgar & Associates used ZWE information and Clean World Partners. Blue Line Transfer, Inc. filed a Tier 2 Pathway application package which was approved by CARB on September 25, 2018, with a certified CI of minus 22.93 for biomethane produced from (HSAD) of food and green waste. CR&R followed with a certified CI

1822 21st Street, Sacramento California 95811 | tel 916.739.1200 fax 916.739.1216 email edgarinc@edgarinc.org

of 0.34 effective July 1, 2018. The CIs vary because Blue Line had a higher percentage of food waste, and CR&R had less than 5% food waste. Both of these CIs now considered a 'legacy pathway', and both facilities have updated their Cis since then, which are near carbon neutral of carbon negative, where a plus 45 CI Temporary Pathway is not reflective of the real science.

The LCFS Regulations were amended in 2018 and became effective on January 4, 2019, with the following components and major concerns:

- Prior legacy pathways will expire on December 31, 2020.
- **Table 8 – Temporary Pathways for Fuel Indeterminate CIs** was adopted. It has a CI value for RNG to be plus 45 and will be used once the legacy pathway expires if no other action is taken, and for new facilities.

South San Francisco Scavenger Company conducted its analysis of carbon intensity for their pathway using a modified version of the Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Organic Waste. The renewable natural gas produced from food scraps and upgraded at facility and used for onsite fueling of their near-zero NOx CNG fleet, received a minus 79.91 carbon intensity. RNG, produced from just urban landscaping waste without any food waste, is just above carbon neutral at 0.28 carbon intensity. This facility was the first carbon negative anaerobic digestion facility that was certified with carbon intensity of minus 22.93, as part of a $2.6 million 2012 CEC grant.

Napa Recycling & Waste Services with Zero Waste Energy is proposing to process up to 44,000 tons per year of source-separated organic wastes. The carbon intensity (CI) value was calculated based on life cycle analysis using a modified version of the Board-approved Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Organic Waste. RNG produced from food scraps and urban and landscaping waste plans to dispense onsite for transportation use in their near-zero NOx CNG fleet. CARB has certified that composite carbon intensity score of minus 165.05 CI. The City of Napa had been awarded a $3 million CEC grant to develop the HSAD Facility

CARB needs to continue to allow the necessary steps for a design- based pathway to determine the 'carbon intensity (CI) for high solids anaerobic digestion (HSAD) following the process below, and immediately remove the plus 45 CI from Table 8:

(e) Design-based Pathways. As set forth in sections 95488.6(a) and 95488.7(a), LCFS fuel pathways are generally developed based on 24 months of operational data. However, in order to encourage the development of innovative fuel technologies, an applicant may submit a Design-based pathway application in the AFP for a fully engineered and designed facility with no operational data.**(1)** Applications for Design-based pathways must include a detailed life cycle analysis of the anticipated pathway performed using the CA-GREET3.0 model, and an LCA report as described in 95488.7(a)(2) detailing facility plans and specifications expected during commercial operation