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September 15, 2014

Todd Sax
Assistant Chief
Mobile Source Control Division
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Transportation Fuels – CARB Technology Assessment Workshops

Dear Mr. Sax:

The California Compost Coalition (CCC) is a statewide organization representing haulers and processors of organic waste, including anaerobic digestion facility operators who produce renewable compressed natural gas (RNG). CCC members operate a fleet of hundreds of heavy-duty collection vehicles, and are transitioning from diesel to lower carbon compressed natural gas (CNG) fuel, with plans to make our own carbon-negative RNG fuel with the organic waste we collect using anaerobic digestion technologies. CCC attended the Workshop on September 3, 2014, and has the following comments, following the format of the CARB PowerPoint presentation.

1. Can Biofuels Be a Primary Solution for our GHG Targets?

CCC and other trade associates such as the Bioenergy Association of California (BAC) believe that biofuels can be a primary solution to reach GHG target.

The true Power of Organics lies in the conversion of food waste and green waste into RNG. A 25,000 ton per year Anaerobic Digestion-to-Renewable Compressed Natural Gas (AD-to-RNG) project can be designed without a pipeline, and the associated leakage, as a community-scale model serving a population of approximately 100,000 people. This model can collect commercial food waste from all accounts and achieve a zero waste goal while deploying a carbon-negative fleet. The co-location of this AD-to-RNG facility where a fleet is parked is a natural fit: combining RNG fuel demand on-site with 328,000 diesel gallon equivalents (dge) per year of RNG production (with a carbon intensity of negative 15 g CO₂e/MJ), servicing a fleet of 35 heavy-duty trucks. The solid waste and recycling sub-sector which is already committed to CNG trucks will be able to make its own RNG.

As part of the AB 32 Scoping Plan First Update recently adopted by CARB, it is estimated that 5.0 million to 7.5 million ton of food waste and green waste should be diverted by 2020 with half going to composting and half going to anaerobic digestion (AD); this volume of feedstocks is sufficient for 100 to 150 of these AD facilities to be built by 2020, producing between 33 million to 50 million dge annually.

California Energy Commission prepared a Technology Assessment in 2014 which states that today's potential supply of biomass resources could produce 2.2 billion gallons per year of fuel, where 24.7 billion gallons is projected to be used in 2014. Of the 2.2 billion gallons, UC Davis analysts determined that 113 million gallons per year could be derived from food waste, diverting 1.2 million bone dry tons of food waste.

The solid waste and recycling industry fleet, comprised of ~15,000 heavy-duty vehicles, uses about 150 million gallons per year of fuel. The Edgar Institute has projected that 80% of the industry's heavy-duty fleet will be CNG by 2020, where 12,000 vehicles will be able to substitute 120 million gallons of diesel fuel with an equivalent amount of RNG.

The solid waste and recycling collection industry has invested in a multi-billion dollar process of transitioning from diesel to CNG, including the potentially brighter future of making our own RNG from food waste to fuel carbon-negative fleets; the CARB Technology Assessment needs to fully understand this: while the projected electrification of our fleet would lower the carbon intensity by only 50% to 60% below diesel, it is a far cry from the reductions achieved by a verified, carbon-negative fleet using RNG.

The CARB Key Observation on the need to electrify the heavy duty sector does not recognize the closed-loop, community-scale, distributed RNG fuel production facilities that we will operate with the food waste that is collected by our heavy-duty trucks.

2. What is the relative emissions benefit of switching to alternative transportation fuels and technologies?

The solid waste and recycling sector heavy-duty fleet is in the midst of a multi-billion switch from diesel to alternative fuels (CNG), where up about 80% of the fleet will be CNG by 2020. Our industry has already experienced the benefit of switching to CNG vehicles on many fronts. Viewing CNG as a bridge fuel, our industry gears up to make our own RNG with the added benefit of fielding a carbon-negative fleet by 2020.

The Technology Assessment does not recognize the carbon intensity value of minus 15.29 g CO₂/MJ for RNG, determined under the ARB LCFS Internal Pathway for the production of Biomethane from the High Solids Anaerobic Digestion (HSAD) of Organic (Food and Green Waste). In keeping with provisions of [Board Resolution 10-49](#), [LCFS Regulatory Advisory 10-04](#), and [LCFS Regulatory Advisory 10-04A](#), the proposed (HSAD) pathways (posted to the below web page) have been approved by ARB staff and are available for use on an interim basis by fuel providers and regulated parties.

<http://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm>

The solid waste and recycling sector heavy-duty fleet will be able to use the RNG from these AD facilities to fuel about 80% of the ~15,000 heavy-duty vehicles in this sub-sector. Where electric vehicles may be "zero emission", the carbon intensity is still about 60% less than diesel, where RNG use is carbon negative.

CARB staff needs to consider adding RNG in the Key Observation, as the Well to Wheel (WTW) for CNG vehicles using RNG is carbon negative and much lower than EFs.

3. What is the impact of methane leakage from the natural gas system on established emission rates?

Anaerobic Digestion-to-Renewable Compressed Natural Gas (AD-to- RNG) project can be designed without a pipeline and the associated leakage as a community-scale model. This model can collect commercial food waste and achieve a zero waste goal while deploying a carbon-negative fleet. The co-location of this AD-to-RNG facility where a fleet is parked is a natural fit by having RNG fuel demand on-site while producing RNG with a carbon intensity of negative 15 g CO₂e/MJ.

The RNG production and distribution is not part of the established natural gas system with the associated leakage rates. RNG is produced, cleaned, and compressed on-site and distributed on-site to the trucks with de-minimus leakage.

In the WTW for HHD trucks: GHG Emission factors for RNG should be presented to compare with electric vehicles.

4. What infrastructure improvements are needed to facilitate the use of emerging fuels?

The solid waste and recycling sector heavy-duty fleet is in the midst of a multi-billion switch from diesel to alternative fuels (CNG), where up about 80% of the fleet will be CNG by 2020. The solid waste and recycling industry is co-locating CNG fueling stations at their facilities that may or may not be publically accessible. ARB staff should also present the number of private CNG facilities (to complement slide 117 of your presentation) which shows that there are 490 publicly-accessible CNG fueling stations. There is a robust, and growing, network of privately available CNG fueling stations for private sector fleets.

RNG does not need to be placed in a pipeline, but can used at the point of generation to fuel a captive fleet. The AD-to-RNG project can be designed without a pipeline and the associated leakage as a community-scale model. This model can collect commercial food waste feedstocks and achieve a zero waste goal while deploying a carbon-negative fleet. The co-location of this AD-to-RNG facility where the fleet is parked is a natural fit by having fueling stations co-located where biomethane is generated to limit transmission losses and infrastructure costs. RNG fueling stations may be time-filled or fast-filled for quick refueling.

Should you have any questions, please contact me at (916) 739-1200.

Sincerely,



Evan Edgar
Regulatory Affairs Engineer