CALIFORNIA COMPOST COALITION

AGROMIN Premium Soil Products
Recology
WASTE ZERO
Mt. Diablo Resource Recovery
Napa Recycling & WASTE SERVICES
zbest composting
VISION RECYCLING Transforming Local Organics
NRWS
Marin SANITARY SERVICE
Upper Valley Disposal & Recycling
Pleasanton Garbage Service, Inc.
Soiland
Clover Flat
Tracy Delta Solid Waste Management, Inc.
CARTS
Cedar Avenue Recycling & Transfer Station
Reduce Reuse Recycle MRWMD
Fremont Recycling & Transfer Station
Quackenbush Mountain Resource Recovery & Compost Facility
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CAL-WASTE
BURRTEC WASTE & RECYCLING SERVICES "We'll Take Care Of It"
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Trillium

September 9, 2020

The Honorable Mary D Nichols, Chair
California Air Resource Board
1001 "I" Street
Sacramento, CA 95814

RE: Comments on the Draft E# Report on Carbon Neutrality

Dear Chair Nichols:

The California Compost Coalition (CCC) is a statewide organization representing operators of permitted facilities involved in the collection, hauling, processing and composting of green and food waste materials throughout California. CCC members collect organic waste and the curb, and employ a fleet of Class 7 vehicles. After processing the organics that are diverted from the landfill to achieve SB 1383 mandates to reduce short lived climate pollutants, CCC members haul the compost, digestate, and wood chips in Class 8 heavy-duty vehicles to regional markets. CCC members recognized the importance of SB 1383 years ago where they have an opportunity to fuel their fleet with the biomethane from the organics waste and produce a renewable natural gas (RNG). CCC members are carbon neutral today with a set strategy promoted by CARB last decade on deploying CNG fleets, and getting off diesel. CCC members are making our own fuel from organic waste diverted from a landfill implementing your short lived climate pollutant strategy. There is no reason to wait until 2045 to be carbon neutral, and there is no reason to derail the plans to use RNG as a carbon negative fuel now and for the long-term for the heavy-duty sector.

CCC submits these comments on E3's Draft Report on carbon neutrality, presented at CARB's public workshop on August 19, 2020. CCC strongly supports current actions of being carbon negative now in order for the state as a whole for carbon neutrality later. CCC agrees with many of the conclusions and recommendations in the Draft Report, particularly the findings that there is a need to pursue all low carbon and carbon negative options, where the Report needs to recognize the momentum happening today on carbon negative solutions, that would only be stymied if the long-term use of RNG is phased for transportation fuel out according to the Draft Report.

1822 21st Street • Sacramento, CA 95811 • (916) 739-1200 • Fax: (916) 739-1216
Neil@californiacompostcoalition.org • www.californiacompostcoalition.org

We are concerned, however, about several of the assumptions and omissions that understate the importance of waste reduction and RNG use in transportation fuel. As described more fully below, our biggest concerns are:

- E3 continues to rely on an unscientific, "population weighted share" of national biomass potential to calculate California's organic waste supply when far more accurate, actual assessments of California's organic waste exist.
- E3 proposes to eliminate biomethane in the transportation sector, yet projects significant continued use of internal combustion engines and diesel fuel for heavy duty vehicles.

We have common concerns with the Bioenergy Association of California as we have common membership and concerns, and CCC supports all of their comments, and echo them here with additional details regarding the waste sector.

The Draft Report Should Not Rely on New Diesel Fueled Vehicles Beyond 2030.

The Draft Report makes several disturbing assumptions about the future of medium- and heavy-duty vehicles in California. First, it assumes that biomethane and natural gas use in vehicles will be phased out by 2035.[1] At the same time, the Draft Report assumes that Californians will continue to purchase medium- and heavy-duty vehicles powered by internal combustion engines for the next few decades. And the only reason for that assumption is that the adoption Advanced Clean Truck Regulations is foisting electrification upon our industry, which is stalling out purchases of new near-zero NOx RNG fleet, which can offer a carbon negative solution now.

This clean heavy-duty near-zero NOx RNG transportation proposition did not emerge suddenly nor in a vacuum. As described in Game Changer – Technical White Paper – Next Generation Heavy-Duty Natural Gas Engines Fueled by Renewable Natural Gas, a wide array of public and private heavy-duty fleet operators and the natural gas vehicles (NGV) industry stakeholders spent billions of dollars to purchase the CNG fleet, build fueling infrastructure, upgrade maintenance facilities, and train personnel. Today, the NGV refuse fleet displaces a significant volume of diesel and reduced NOx by over 90% (compared to diesel engines available today). The NGV industry can go Deep Carbon Now and not wait until 2045 to be carbon neutral. CARB is ACTing out in their Advanced Clean Truck Regulations by promoting a regulation to replace the NGV industry and leave billions of dollars in stranded investment. This ACT long-term strategy that will not achieve the same near-term NOx and carbon reductions that NGVs are delivering today, and will not create a demand for the RNG fuel that needs to be produced to implement SB 1383.

Specifically, the Draft Report projects that:

- Nearly half of medium-duty vehicles, and more than half of the heavy-duty vehicles, purchased in 2035 will be internal combustion engine vehicles;
- 15-20% of heavy-duty vehicles purchased in 2040 will be internal combustion engines; and
- 7 percent of heavy-duty vehicles will still be powered by diesel in 2040.[2]

[1] Draft Report at page 40.
[2] Draft Report at pages 43-44.

These findings are not consistent and do not make sense. There is no reason to preserve a diesel pathway to get to carbon neutral later in 2045, instead of promoting a RNG carbon negative pathway today. If the Draft Report is assuming that biomethane and natural gas will be phased out of the transportation sector, but 15-20 percent of new heavy duty vehicles will still rely on internal combustion engines in 2040, then how is it possible that only 7 percent will be powered by diesel? More importantly, why would California plan to have any new diesel fueled vehicles in 2040, or even 2030, when diesel powered heavy-duty vehicles are the largest source of air pollution in the two most polluted air districts in the country, the South Coast and San Joaquin Valley Air Districts.

Eliminating the use of diesel should be one of California's top priorities for both climate change and air quality since diesel emissions contain black carbon and toxic air contaminants and are a major source of smog-forming pollution. In fact, Governor Newsom has called for the end of diesel-powered vehicles by 2030.[3]

The projections in the Draft Report appear to be inconsistent regarding the percentages of medium- and heavy-duty vehicles, the elimination of biomethane, and the continued use of diesel. BAC urges E3 to prioritize the elimination of diesel powered vehicles as quickly as possible, and certainly by 2030 as Governor Newsom has called for, and to substitute near-zero emission natural gas vehicles powered by biomethane for medium- and heavy-duty vehicles that rely on internal combustion engines. This pathway will provide the greatest reductions in lifecycle carbon emissions and air pollution.

Lawrence Livermore Labs (LLL) released a January 2020 report, "Getting to Neutral – Options for Negative Carbon Emissions in California", which featured the conversion of biomass into transportation fuels. This program are noted as the most cost-effective solutions using current technologies on converting organic waste into carbon negative products such as renewable natural gas. E3 should recognize this cost-effective solution and reference this report.

SB 1383 RNG Producers and Procurement

CCC member are the fleet owners that collect organics that fuel our trucks. We are organic waste processing facility operators that can produce renewable natural gas (RNG) from the collected organics. We are Net-Zero Facilities that can make carbon negative fuels from the collected organics, and we haul compost and wood chips to markets. We implement the circular economy in California. Recovered Organic Waste Products have regional markets for current tons and will soon have local government procurement SB 1383 requirements for the millions of new tons. A ton of organic waste can produce 21 diesel gallon equivalents of RNG and can fuel the entire refuse and recycling fleet. Much of the refuse industry has already transitioned off of diesel far before Governor Newson's 2030 diesel pollution phase out and into a CNG fleet that uses RNG and/or will produce their own RNG. The Draft Study need to recognize this SB 1383 Short-lived Climate Pollutant strategy that is occurring by 2025, and not wait until 2045 to achieve deep carbon neutrality.

Procurement of Recovered Organic Waste Products is being proposed in Article 12 of the SB 1383 regulations. Recognizing the importance in developing RNG demand, CCC has been out in front supporting

[3] Gavin Newsom's campaign platform for Governor stated his goal to "Set California on the Fast Track to Zero Diesel Pollution by 2030."

this inclusion in the regulation. CalRecycle presented a fair share calculation with flexibility of procuring these bio-products with an RNG option, where up to 74 million gallons of diesel gallon equivalents of RNG could be used each year and could fuel up to 6,000 CNG refuse trucks, of the State 15,000 refuse fleet. Local jurisdictions can delegate the RNG use to the local franchise hauler, and fulfill the procurement requirement. This is an elegant community-scale fit.

Refuse Fleets Winning the Race to Deep Carbon Intensity Now

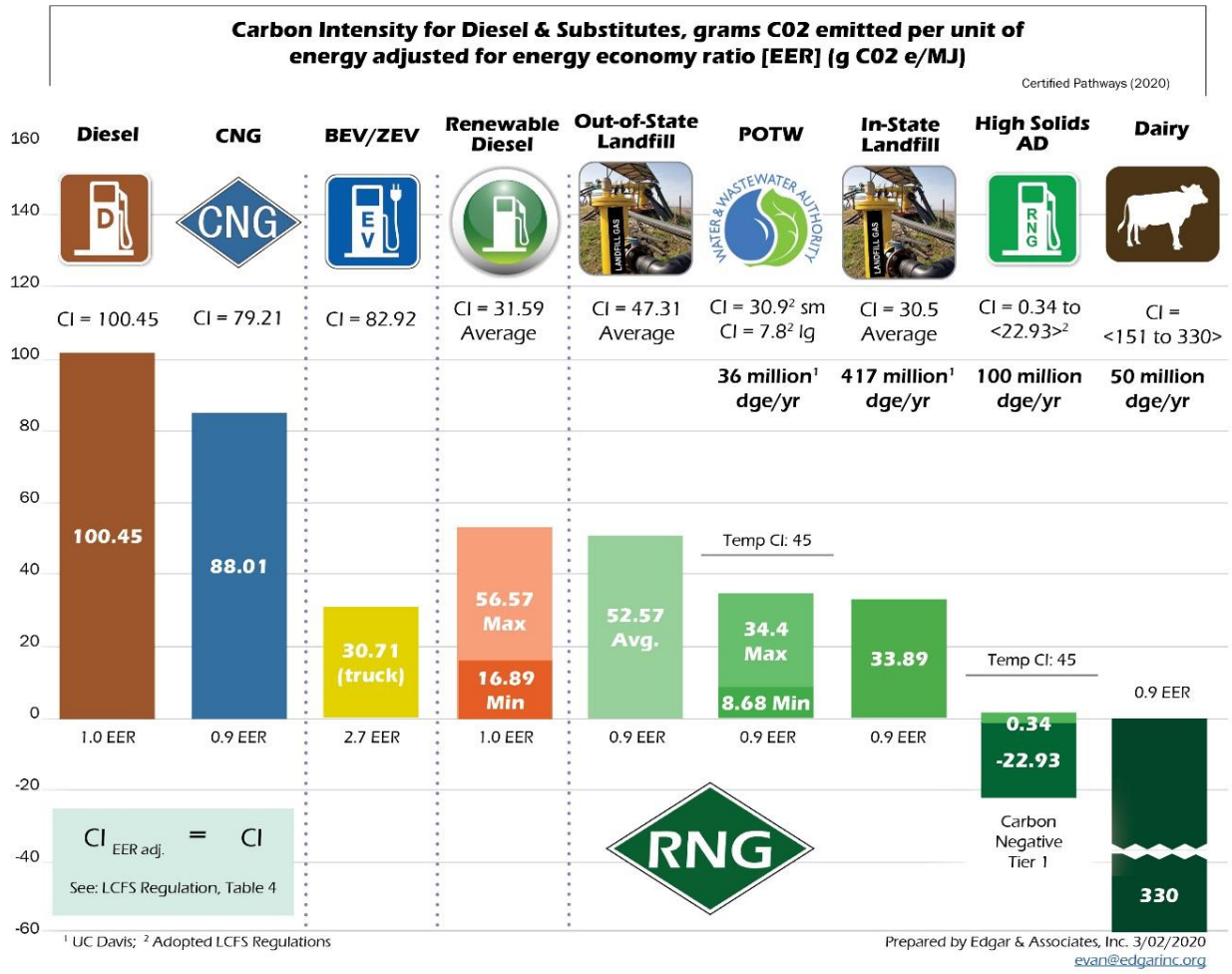
The Low Carbon Fuel Standard (LCFS), which sets annual carbon intensity (CI) standards, takes into account the GHG emissions associated with all of the steps of producing, transporting, and consuming a fuel—also known as a complete lifecycle. The wide range of carbon intensities is due to variations in feedstock types, origin, raw material production processing efficiencies, and transportation, all of which contribute to an individual producer's fuel pathway CI.

Replacing diesel with a lowest CI fuel should not be phased out in the Draft Report. The solid waste industry has made great strides developing the CNG infrastructure and purchasing CNG fleets to get off diesel, as CARB has insisted for years. The industry viewed CNG as a bridge fuel that has been replaced by renewable natural gas (RNG) with much lower CIs, such as the case with current RNG use in California. Referencing the 2019 CARB Certified Pathways, out-of-state landfill gas averages 52.57 CI while in-state landfill gas averages 33.89 CI and can produce up to 417 million dge/year. Wastewater RNG has been 8.68 CI for larger facilities and 34.4 CI for smaller facilities and can produce up to 36 million dge/year, with some individual pathways heading toward carbon negative CI. Anaerobic digestion RNG is now certified as 'carbon negative' CI, and has the ability to produce 100 million dge/year. Dairy RNG can produce 50 million dge/year deep into 'carbon negative' CI.

Out-of-state landfill gas RNG is now being viewed as a bridge fuel, as in-state RNG is being developed. The solid waste industry is racing to 'carbon neutral' CI for their RNG fleet by 2025, with full implementation of SB 1383. Meanwhile ZEVs have a 38.9 CI and will not reach carbon neutral CI until 2045, when the California grid is expected to be carbon-free. Refuse fleets may be winning the race, but are losing the policy position as being Deep Carbon Now, as this is not enough for CARB, who want a perfect 2045 carbon neutrality. The Draft Reports needs to recognize the CI and the in-state RNG supply.

Refuse Fleet RNG Business Model for SB 1383

CCC authored a White Paper for the California Energy Commission, Biomethane Transportation Fuel Powering the Solid Waste Industry: Community- Scale Distributed Fuel Production Facilities, applicable today in the SB 1383 era. CEC found this business model attractive: franchised organic feedstocks are taken to an anaerobic digestion facility that is co-located where the captive fleet is parked and fueled, in a community-scale system that could be replicated throughout California. A 30,000 ton per year anaerobic digestion renewable natural gas (AD-to-RNG) project can be designed without a PUC pipeline as a community-scale model, and can serve a population of approximately 100,000 people. This model can produce 400,000 diesel gallon equivalents per year of RNG with a default carbon intensity of neutral to 0.0 g CO2e/MJ, and could file for a site-specific intensity as low as negative 105 g CO2e/MJ, for a fleet of 50 heavy-duty trucks.



The solid waste and recycling industry of 14,000 heavy-duty vehicles uses over 182 million gallons per year of fuel and can produce its own fuel. Additional RNG could be procured from dairies, wastewater treatment plants, and in-state landfills with an estimated potential of over 36 million dge per year for wastewater treatment plants and an estimated production of 417 million dge per year from in-state landfills (Williams, et. al., 2014) and 50 million dge from dairies. The incremental cost differential between diesel and CNG heavy-duty trucks is about $50,000, and both the CEC and CARB have been requested to maintain funding the difference following the Hybrid Voucher Incentive Program model. With nearly 5,200 refuse trucks already using CNG/RNG, approximately 7,000 waste collection vehicles and 1,800 transfer trucks are still operating on diesel in California's solid waste management industry. It would take a $440 million over the next 4 years to have the refuse fleet be carbon neutral with near-zero NOx engines.

Several of the Report's Findings are Unsupported by the Data or Contradict State Law.

There are several areas of the Draft Report that present cost data, emissions reductions conclusions, or other information without any supporting documentation. In a few cases, the information presented directly contradicts state law or the scientific consensus. BAC urges E3 to correct, or provide background data and analysis to support, at least the following:

The Draft Report incorrectly assumes no carbon reductions from the waste sector.

The Waste Sector and the compost industry are Net-Zero GHG Now, with a huge commitment to carbon negative fuel now. E3 should not be making these irresponsible assumptions and CARB's should have provided E3 on current polices underway. Figure 22 on page 61 of the Draft Report indicates that the

> **Achieving Net-Zero GHG Emissions from the Waste Sector**
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> Beyond 2020, additional reductions in GHG emissions from the Waste Sector will be needed to achieve a Net-Zero GHG emissions goal. To achieve these reductions, even greater diversion of organics and other recyclable commodities from landfills must be realized and further expansion and enhancement of the alternative non-disposal pathways must be developed. In addition, greater emphasis will need to be placed on reducing the volume of waste generated, recycling/reusing products at the end-of-life and remanufacturing these materials into beneficial products. To achieve Net-Zero, the direct GHG emissions from the Waste Sector would have to be fully offset by avoided GHG emissions. Avoided GHG emissions are reductions in life-cycle GHG emissions that would occur because waste is shifted from landfilling to alternative non-disposal pathways. *AB 32 Scoping Plan – First Update May 2014*

waste sector will not cut carbon emissions appreciably between now and 2045. This contradicts the requirements of SB 1383 (Lara, 2016) to cut methane emissions 40 percent by 2030 and to divert 75 percent of organic landfill waste to energy or compost by 2025. According to CalRecycle analysis, the landfill diversion alone will reduce emissions by 85 to 90 million metric tons of CO_2e.[4] When converted to energy, diverted organic waste can provide carbon negative emissions on a lifecycle basis since they reduce fugitive methane emissions from landfills and flaring of landfill gas, in addition to displacing fossil fuel combustion. Figure 22 should be corrected to include carbon reductions in the waste sector.

The California GHG Scoping Plan First Update was adopted on May 15, 2014 by the California Air Resource Board and includes the Net-Zero concept as copied below. Net-Zero is defined by the California Air Resource Board as an organization using as much energy as it produces. To meet Net-Zero, one's avoided GHG emissions must be greater than or equal to one's operational GHG emissions. By all accounts, the Waste Sector is Net-Zero Now, with a huge commitment to RNG or carbon negative fuel now.
CARB adopted the First Update of AB 32 Scoping Plan in May 2014 on having the Waste Sector be Net-Zero by 2035. The solid waste sector is Net-Zero Now.

CCC members are 15 to 20 times Net-Zero Now as verified the Scope 1 and Scope 2 emissions by the Climate Registry against the life-cycle analysis of landfill alternatives. Waste Management Inc. determined that they are 3 times Net-Zero GHG now with a moonshot goal to be 4 times Net-Zero within 20 years with a cleaner fleet and more recycling in their 2018 Sustainability Report, linked here: http://sustainability.wm.com/downloads/report.php.

[4] California's Climate Strategy: Waste Sector Goals (4/18/2019).

The Draft Report asserts that BECCS is risky, costs likely to remain high, and ignores biochar and compost as an option for carbon sequestration.

The Draft Report makes a number of statements about BECCS that are incomplete or unsupported. In particular, the Draft Report asserts that BECCS is risky, costs are likely to remain high, and that geologic carbon storage is expensive and risky. The Draft Report fails to compare the costs per ton of carbon reduction from bioenergy, which can be quite cost-effective since it often produces carbon negative fuels and power. Comparing bioenergy costs to intermittent renewables is a false comparison, since intermittent renewables require backup generation and/or storage. E3's own analysis, presented to the CPUC earlier this year, found that the marginal costs of batteries will start to go up and ultimately end up several times more expensive than bioenergy.

The discussion of BECCS ignores the potential to generate biochar as a byproduct that has both economic value (thereby reducing the cost of bioenergy production by providing an additional revenue stream). The Draft Report also ignores the proven role of biochar to sequester carbon, incorrectly assuming that the only method of carbon sequestration and storage is geologic storage. Instead, the Draft Report asserts that the potential for BECCS is "limited by the potential for geologic carbon sequestration in California."[5] The scientific consensus is that biochar can provide at least 100 years of carbon sequestration, which is enough to be classified as "permanent" sequestration and should be included as a way to sequester carbon, increase revenues, and reduce the lifecycle carbon intensity of biomass to energy projects.

CCC members produce biochar and compost, and mix these products to sequester the compost into the natural working lands of California. Lawrence Livermore Labs (LLL) released a January 2020 report, "Getting to Neutral – Options for Negative Carbon Emissions in California", which featured natural solutions where compost and biochar are sequestered in the soils. These programs are noted as the most cost-effective solutions using current technologies on converting food waste, green waste, and wood waste into carbon negative products such compost and biochar from biomass gasification.

The Governor's Office of Planning and Research, the California Department of Food and Agriculture, the Forest Management Task Force, and other state agencies have conducted extensive research on biochar, which should be included in any discussion of biomass conversion or carbon sequestration.

The Draft Report makes several assumptions of cost of technologies that contradict actual data on the ground and peer reviewed studies. (p. 73)

Figure 25 on page 73 shows the costs per ton of carbon reduction for many different technologies, with no real explanation or citation for most of the data presented in the graph. Several of the data points directly contradict the costs of carbon abatement under the Low Carbon Fuel Standard and findings of other reports, including several recent reports by the California Legislative Analyst's Office on the cost-effectiveness of different transportation climate programs.

CCC is particularly concerned about the assertion that electrification of medium- and heavy-duty vehicles would have negative costs per ton of carbon reduction. This is not explained or supported in the Draft Report itself and it flatly contradicts the findings of the LAO's reports, reports conducted for the Los Angeles Metropolitan Transit Agency, and ARB's own analysis under the Clean Transportation Program. The cost data presented in Figure 25 also contradicts the cost analysis provided in Lawrence Livermore National Lab's peer-reviewed report on carbon neutrality. That report found that biomass conversion to

[5] Draft Report at pages 63-64.

energy can cut carbon emissions for an average cost of $64 per ton. The final report should correct or verify the cost data in this graph and explain the basis for finding that vehicle electrification can provide negative cost carbon reductions.

The Draft Report concludes, without explanation or data, that converting biomethane to hydrogen will not displace fossil fuels.

The Draft Report asserts that converting biomethane to hydrogen will not displace fossil fuels.[6] There is no explanation for this statement, which contradicts other reports and real world experience where hydrogen derived from biomethane is being used to displace fossil fuels, including on UC campuses, at wastewater treatment facilities, and elsewhere.

CARB should recognize the need to preserve the HVIP funding for a CNG fleet with the Near-Zero NOx engine to transition from diesel, and create a demand for the in-state RNG from SB 1383 organic waste diversion facilities.

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

Sincerely,

Evan W.R. Edgar
Regulatory Affairs Engineer

[6] Draft Report at page 71.