BIOENERGY IN THE SOLID WASTE SECTOR

California landfills millions of tons of food, yard and other organic waste each year. Converting that waste to energy and the biogas generated from waste already in landfills could generate nearly 1 billion gallons per year of low carbon transportation fuels or almost 4,000 MW of renewable electricity – enough to power more than 1 million homes. The public health and economic benefits of converting that organic waste to energy would be huge, including:

- Producing low carbon and carbon negative transportation fuels;
- Cutting toxic air pollutants and smog, especially in Disadvantaged Communities;
- Producing baseload and flexible generation renewable power needed to complement wind and solar;
- Helping California to meet its waste diversion goals;
- Producing jobs and revenues in every region of the state.

Bioenergy Potential in the Solid Waste Sector. California landfills more than 22 million tons of organic waste per year -- almost two-thirds of the waste that is landfilled in California.[1] The organic waste that is already in landfills produces enough biogas as it decomposes to generate 457 million gallons of low carbon transportation fuels or about 1,900 MW of renewable electricity. Going forward, diverted organic waste can generate an additional 492 million gallons[2] of transportation fuel or about 2,000 MW of baseload, renewable electricity.[3]

CR&R'S FACILITY IN RIVERSIDE COUNTY WILL CONVERT 320,000 TONS OF FOOD AND YARD WASTE INTO 4 MILLION GALLONS OF CARBON NEGATIVE FUEL PER YEAR. USED IN ULTRA-LOW EMISSION TRUCKS, THE PROJECT WILL CUT GHG AND AIR POLLUTION BY MORE THAN 90%.

[1] CalRecycle Technical Paper on "*Landfilling of Waste*," released September 17, 2013, Table 1, page 2.
[2] This fact sheet uses the term "gallons" for gasoline gallon equivalents (gge) since the fuel produced from organic waste would be compressed natural gas (CNG) or liquefied natural gas (LNG).

Climate Benefits. Converting organic landfill waste to energy is one of the most cost-effective investments the state can make to reduce greenhouse gas and Short-Lived Climate Pollutant emissions.[4] According to the California Air Resources Board, fuels made from diverted organic waste are carbon negative because they capture methane and reduce fossil fuel uses. Biogas generated from organic waste can cut greenhouse gas emissions by 130 percent compared to diesel and gasoline. Capturing landfill gas and using it for electricity or transportation fuel also cuts greenhouse gas emissions by reducing emissions from the landfill and replacing fossil fuels. Biogas generated from landfills – which is generated for decades after a landfill stops taking organic waste – can also provide flexible generation power that is critical to complement solar and wind power since biogas is available 24/7.

Public Health Benefits. The public health and environmental benefits of converting diverted organic waste and landfill biogas to energy are significant. Reducing landfill disposal of organic waste cuts emissions from diesel powered garbage trucks and reduces methane emissions from the landfills themselves, which helps to reduce smog. Bioenergy from diverted organic waste or landfill gas can also be used in place of fossil fuels, further reducing air pollution that would be caused by diesel, gasoline, or natural gas use. When diverted organic waste or landfill gas are converted to hydrogen, they can provide virtually emissions free energy – either transportation fuel, electricity, or a renewable gas for hard to electrify end uses such as manufacturing and industrial purposes.

Jobs and Economic Development. Biogas generates 2 to 6 times as many jobs as fossil fuel gas.[5] It also generates revenues for public agencies and local governments, new businesses, income for dairies and farms, and increased energy security for the state as California replaces out of state gas imports with in-state energy production. Converting California's organic landfill waste and landfill gas to energy can create thousands of good jobs across the state, especially in Disadvantaged and low-income communities.

RAVEN SR'S PROJECT IN RICHMOND, CALIFORNIA, WILL CONVERT DIVERTED ORGANIC WASTE AND LANDFILL GAS TO CARBON NEGATIVE HYDROGEN THAT WILL BE USED TO REPLACE DIESEL IN HEAVY DUTY TRUCKS. THE PROJECT WILL CREATE 100 TO 150 CONSTRUCTION JOBS AND 15 TO 18 PERMANENT JOBS IN A LOW-INCOME AND DISADVANTAGED COMMUNITY.

[4] California Air Resources Board, *California Climate Investments 2022 Mid-Year Data Update* and CARB's *2021 Annual Report to the Legislature on California's Climate Investments*, Table 2, pages 17-18.
[5] UC Berkeley's Green Job Calculator, http://rael.berkeley.edu/greenjobs.