ZERO HERO PROGRAMS OF THE RECYCLING INDUSTRY

READVANTAGING COMMUNITY-SCALE SYSTEMS

THROUGH SUSTAINABLE FACILITY, FUEL, FLEET, FEEDSTOCKS & FARMING

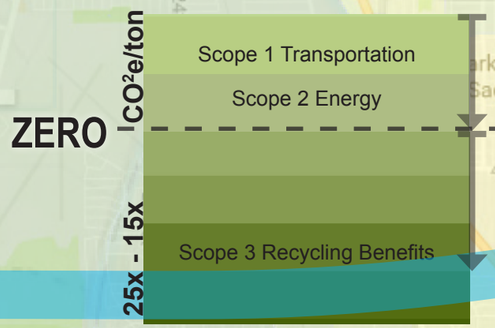
Edgar & Associates

California Compost Coalition

NET ZERO FACILITIES

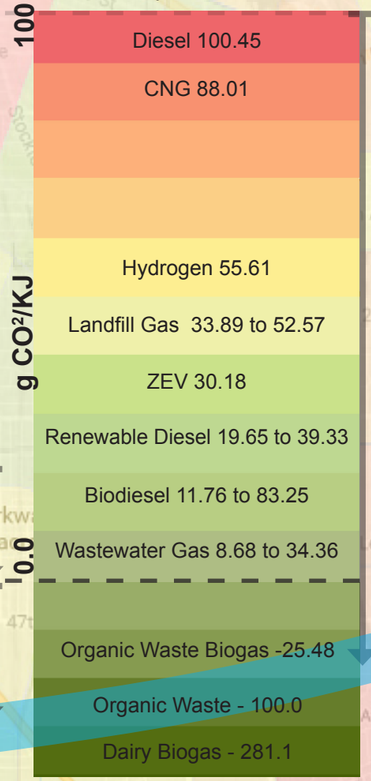
Greenhouse Gases

The Net Zero Facilities in recycling sector including material recovery facilities processing recyclable materials, compost facilities, anaerobic digestion facilities, and biomass conversion facilities. The new composting facilities are covered aerated static pile systems using the best available control technologies and the anaerobic digestion facilities are enclosed closed-loop system without high temperature incineration. The avoided GHG emissions for these facilities compared to landfilling fully offset the project emissions including collection, hauling, processing activities and the landfilling of residuals. Landfills and garbage Transfer Stations are in the waste sector and are not Net Zero Facilities.



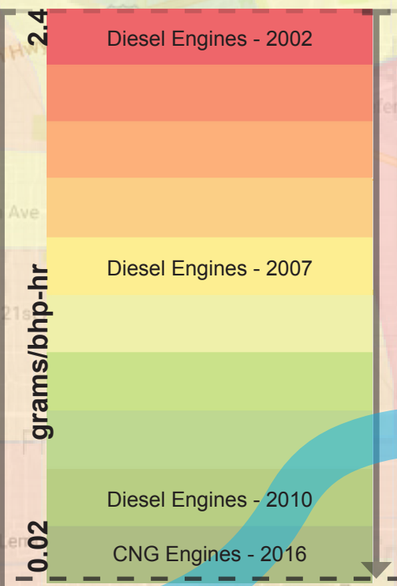
CARBON NEGATIVE FUEL

Carbon Intensity Transportation Fuel



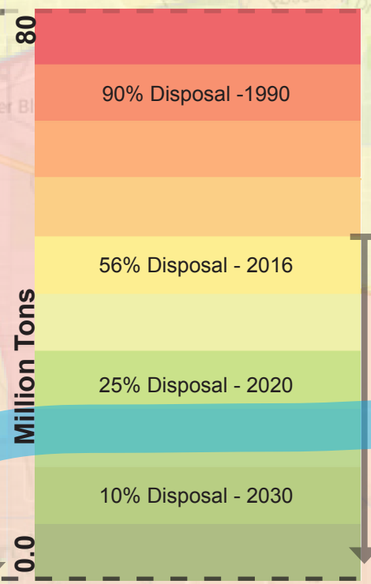
NEAR ZERO FLEET

Heavy-Duty Vehicle NOx Emissions



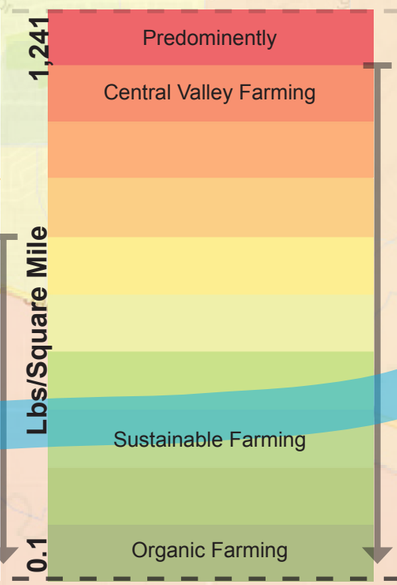
ZERO WASTE

Disposal Solid Waste Tons



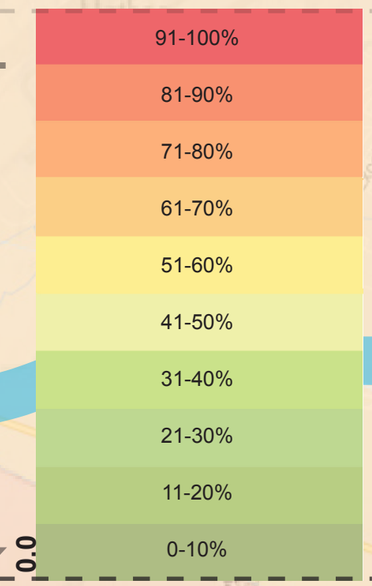
ZERO PESTICIDE USE

Pounds of selected active ingredients



DISADVANTAGED COMMUNITIES

CalEnviro Screen 3.0 results



ZERO

Community-Scale Carbon Negative Near Zero Emissions at Net-Zero Facilities

The Short-Lived Climate Pollutant Plan (SLCP) was adopted on March 23, 2017 and the SB 32 Scoping Plan Update with 2030 goals is being consider by CARB on June 23, 2017. The community-scale anaerobic digestion facilities model is at the intersection of the SLCP, SB 32, and the Governor's Five Pillars that California will: (Pillar 1) reduce today's petroleum use in cars and trucks by up to 50%; (Pillar 2) increase from one-third to 50% our electricity derived from renewable sources; (Pillar 3) double the efficiency savings from existing buildings; (Pillar 4) reduce the release of methane which includes diverting organics from the landfill by 2025; and (Pillar 5) manage farms, rangelands, forests and wetlands so that they can use compost and store carbon. RNG produced at these anaerobic digestion (AD) facilities has been deemed to be carbon negative and when utilized in CNG trucks with the near zero emissions will be a game changer today by reducing heavy duty diesel emissions now while striving for zero waste. The digestate can be composted to produce organic materials to reduce pesticide and fertilizer use to produce healthy soils. A 25,000 ton per year, or 100 tons per day, AD-to-RNG project is designed as a community-scale model, and can serve a population of approximately 100,000 people. This model can produce 333,000 diesel gallon equivalents per year of RNG with a carbon intensity of negative 22.9 g CO2e/MJ for a fleet of 45 heavy-duty trucks with near-zero NOx emissions.

AB 32 Scoping Plan 2014 Update Waste Sector

Net-Zero GHG Emissions from the Waste Sector by 2030. Reduce Scope 1 emissions with alternative fuels. Reduce Scope 2 emissions with roof-top solar and on-site bioenergy. Avoid Scope 3 GHG emissions with recycling and composting. 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. Most material recovery facilities are 15 to 25 times offset over their GHG emissions.

NET ZERO NOW

LCFS Pathway CARB Certified Carbon Intensities

The wide range of carbon intensities is due to the lifecycle emissions methodology of the Low Carbon Fuel standard (LCFS); variation of feedstock types, origin, raw material production, processing efficiencies, and transportation all contribute to the producers' fuel pathway carbon intensity. The certification of carbon negative fuel for the production of renewable natural gas (RNG) from organic waste anaerobic digestion is based on the biogenic feedstocks of food waste and green waste, and the avoided methane emissions from the landfilling of the material. The CNG truck collect food waste to make RNG.

OFF DIESEL

CARB and EPA certified ISL G NZ (8.9) L CNG engines

In 2015, Cummins Westport certified the world's first heavy-duty engine at near-zero-emission levels (90 percent below the existing federal standard) for Class 7 refuse trucks and will be available for Class 8 transfer trucks in 2018. To complement the NOx reductions provided by this landmark engine, conventional (fossil) natural gas provides significant GHG reduction benefits. However, renewable natural gas with carbon negative fuel completes the game changing proposition by providing the lowest carbon intensity of any heavy duty transportation fuel available in the market today.

KNOCK OFF NOx

90% or more Waste Reduction from Landfills and Incineration

Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Communities that have a Zero Waste goal and are working towards or have reduced their waste to landfill, incineration and the environment by 90% or more. Dozens of large cities have adopted zero waste goal by 2025. California is at a 45% recycling rate as compost facilities are curtailed by NIMBYism.

OFF LANDFILLS

Healthy Soils Initiative with Compost Use

Communities near agricultural fields, primarily farm worker communities, may be at risk for exposure to pesticides. Drift or volatilization of pesticides from agricultural fields can be a significant source of pesticide exposure. The use of most synthetic pesticides and fertilizers is prohibited from organic production. Organic farming with certified organic compost use and a zero pesticide goal makes healthy soils. The multiple co-benefits of enhanced soil organic matter on our agricultural lands, include improved water retention, soil stability and nutrient use efficiency to reduce fertilizer use.

OFF PESTICIDES

CalEnvironScreen 3.0 Cap-and-Trade Investments

The California Communities Environmental Health Screening Tool (CalEnviroScreen) helps us to address environmental threat challenges. The objective in developing this tool is to use it to assist California communities by directing state and potentially local government resources toward a common purpose: the revitalization of disadvantaged communities and the pursuit of environmental justice. Cap-and-trade proceeds have funded projects where over $3.3 billion has been appropriated with 50% of the funding benefitting DACs and 34% located in DACs.

GREENING YOUR COMMUNITY

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