



Anaerobic Digesters as a Tool for California's Clean Transportation Efforts

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by [Cliff Gladstein](#)

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As one of the most populous states in the nation and a center of agricultural activity, California faces a waste disposal problem. Organic waste sent to municipal waste water treatment plants and landfills from cities, businesses, industry and agricultural operations not only take up significant space but are also a significant, if lesser-known, source of greenhouse gas (GHG) emissions. In fact, California's largest single source of fugitive methane, a powerful greenhouse gas with a global warming potential 28 to 36 times higher than carbon dioxide, is the state's dairies. In another example, uncontrolled decomposition of food and green waste in landfills leads to heavy production of methane gas, of which 34-51% escapes the typical landfill capture system. With proper collection, however, and refinement through anaerobic digestion, the energy-rich gases seeping from our waste management systems can be processed into [renewable replacements for diesel and other fuels](#).



How and Where do Anaerobic Digesters Work?

Whether it be food waste, livestock manure, municipal solid waste or other organic material, all anaerobic digestion facilities process a carbon-rich organic feedstock that undergoes a series of common biological mechanisms to become a biogas with a high methane content. The untreated biogas can be used directly onsite for heating or power generation, or it can be further cleaned for injection into the gas pipeline system. Cleaned biogas is chemically identical to conventional gas and can therefore be used for any of the same purposes, including as vehicle fuel or in residential and commercial applications. Using the processed gas onsite can help defray heating and vehicle fueling costs, or the facility can add an additional revenue stream by selling pipeline quality gas or electricity to fuel or utility providers. Furthermore, co-locating digesters at wastewater treatment plants, dairies, landfills, etc. benefits surrounding communities as facilities can better manage nutrients, divert organics from landfills and reduce odors that would otherwise result from uncontrolled decomposition.

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Anaerobic Digesters are a Savvy Investment for California

In addition to providing valuable emissions benefits to California's transportation sector, investing renewable natural gas production through anaerobic digestion is a cost-effective climate protection solution for the state. Anaerobic digestion produces a low-carbon fuel that can replace conventional fuels immediately in natural gas vehicles without any retrofits. By displacing conventional fossil fuels and repurposing the energy from waste decomposition, digesters provide emissions reductions per dollar invested unmatched by other air quality funding programs in the state. The [2017 California Climate Investments Annual Report](#) noted that funding programs such as Advanced Technology Freight Demonstration Projects required \$3,613 of funding invested per ton of CO₂ equivalent (MTCO₂e) GHGs reduced, with the Hybrid and Zero Emission Truck and Bus Voucher Incentive Project (HVIP) coming in at \$329 per MTCO₂e. In contrast, the [California Department of Food and Agriculture Dairy Digester Research and Development Program](#) measured \$7 per MTCO₂e reduced, and the CalRecycle Organics Grant Program at \$9 per MTCO₂e. Investing in digester projects means the state can get the biggest "bang for the buck" of tax payer dollars spent to improve air quality.

With continued regulatory incentives and education for industry members, the anaerobic digesters' growth as a fuel source can accelerate the state's – and the nation's – transition to a cleaner, sustainable energy future.

Expanding Opportunities to Help Meet California's Environmental Goals

Anaerobic digesters have untapped potential as a regulatory compliance tool as the state continues to set aggressive environmental goals. For example, the HVIP program requires that fleets receiving funding for low NO_x natural gas engines use renewable natural gas for 100% of their fuel supply for three years. At the same time, Governor Jerry Brown announced a goal of 75% diversion of solid waste from traditional landfills to recycling, composting and other source reduction (including digester) pathways by 2020. Without a reliable fuel supply or waste diversion capacity, these goals will go unmet, giving compelling reasons to expand the development of anaerobic digestion infrastructure.

There are a number of current and recent funding opportunities directed towards anaerobic digesters. Most timely, the aforementioned California Department of Food and Agriculture (CDFA) Dairy Digester Research and Development Program is accepting applications until January 26th and will allocate between \$61 to \$75 million for the installation of digester projects in the state. But there remains significant room for growth to harness this powerful and underutilized energy source. With continued regulatory incentives and education for industry members, the anaerobic digesters' growth as a fuel source can accelerate the state's – and the nation's – transition to a cleaner, sustainable energy future.