

Affirmative biogas action with right pumps and mixers

As California takes affirmative action to address climate challenges, including the 23 million tons of organic waste that it produces annually, the environmental services industry is also taking positive steps to ensure that the unwanted material is put to the best possible use.

This includes upgrades of the important mixing process at anaerobic digestion facilities to boost biogas yields from material that would have otherwise been destined for landfill; releasing harmful methane, rather than converting it into clean, green renewable energy.

First anaerobic digester

In May 2023, Republic Services, a leader in the environmental services industry, made a significant expansion of its organics recycling operations when it acquired North State Bioenergy, a biogas facility at Oroville; its first anaerobic digester. The site, located some 70

miles north of Sacramento, was once home to a rendering plant, from whom the AD plant received organic matter, but it now mainly uses commercial food waste from across Northern California as feedstock for its principal, 64' high, 2200m³ (580,000-gallon) digester.

With Republic Services wanting to optimize the biogas operation at Oroville, a new submersible chopper pump has been introduced for the facility's 20,000-gallon Receiving Pit; from the same company whose equipment still works efficiently and effectively on the main digester.

Minimizes safety risks for our operators

Dave Meyer, Operations Manager at Republic Services, explains:

"We made a calculated investment when we chose the Landia GasMix system for the main digester. It is a highly dependable system, with external accessibility, which simplifies maintenance and avoids costly downtime associated with internal components.

Unlike other systems with moving parts inside, Landia's design minimizes safety risks for our operators and ensures a seamless, efficient, and profitable process without the challenges of shutting down a delicate biological operation."



Ten years on, and the GasMix Chopper Pumps on the main digester are still going strong.

When Republic Services decided to replace the pump for the Receiving Pit at Oroville, it chose Landia again for the demanding food-waste application that runs 24/7, 365-days a year. The new Landia Chopper Pump is stainless-steel, 30HP, with an external 5-blade knife system that continuously reduces the particle size of the feedstock. Using the original site drawings that Landia had safely archived, it meant that the new submersible could be integrated with the original pump and mix system, dropping the new Chopper Pump straight into the Receiving Pit. It now blends up all the incoming food waste (25-30% solids; some of it pre-processed at a Republic Services' facility in Sacramento), ensuring that there is a continuous, consistent flow of homogenized feedstock going into the digester.

From the Receiving Pit at Republic Service's Oroville facility, the food waste now homogenized by the Landia Chopper Pump is transferred into two tanks (40' diameter by 24' high), where the first acid-forming phase of the biogas production process takes place.

These heated tanks contain bacteria that break down the material and prepare it for its onward process. When the feedstock is ready, it is then pumped into the main digester where the biogas-producing bacteria get to work.

Ken Jacobs, Landia's Aftermarket Manager, added: "It's fair to say that we had some fun and games at first with the install of the new Chopper Pump. Sometimes, nothing seems straightforward when upgrading a biogas plant (!), but Dave and I worked closely to make everything right. We have a fully-stocked inventory in the US, so can always provide back-up, without delay."

In 2022, Republic Services recycled 2 billion pounds of organic waste. Diverting this organic material from a landfill provided a climate benefit equivalent to removing the annual emissions of 22,000 passenger vehicles.

Organics recycling directly supports Republic Services' sustainability goal to increase the recovery and circularity of key materials from the waste stream by 40% by 2030.



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