Mixing matters for Eco's sustainable solution

Comprehensive mixing of biogas digesters is playing a crucial role at one of the most dynamic and well-run food-waste-to-energy facilities in Europe.

Typically operating at more than 90% efficiency, Eco Sustainable Solutions' plant near Dorchester in southwest England, produces biogas at an **average of 140m³/ ton of food waste**, which is sourced from 60,000 domestic kerbside collections in Dorset.

Processing **42,000 tonnes of food waste per annum** (posting its best performance results since opening in 2014), Eco's two 2600m³ digesters are each fitted with Landia's externally-mounted mixing system, comprising 18.5kW chopper pumps and venturi nozzles.

system's chopper pumps benefit from a unique knife design that prevents solids from entering the casing.

Helping us improve our biogas yields by more than 10%, and keeps our team safe'

"We much prefer a mixing system that is outside the tank", said Eco's Operations Manager, Kieran Purkis.

"I'm really not sure why some biogas systems still require mixers to be lifted out of a tank. We are health and safety led, so it's a no for us. It involves far too many risks. It also doesn't make sense financially. In addition to helping us improve our biogas yields by more than 10%, another benefit of the Landia digester mixing system is that it keeps our team safe".

The initial upswing in biogas came in 2014, when Landia was chosen for a new, second digester. As well as greatly reducing the health and safety risks, the boost in producing

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more biogas with consistent concentration of methane circa 58-62% saw Eco move to upgrade the equipment on its first, existing digester.

Here, a rotary submerged system had been in operation, but the considerable downside of downtime became very apparent when an internal mixer broke, meaning that the digester had to be drained down to retrieve it. During days of lost production, this type of scenario can cost a biogas plant a loss of in the region of £250,000. As with all biogas digesters – even when very well managed – draining down to remove accumulated grit every two to three years is a very costly exercise in going offline.

"Since then,", added Eco's Kieran Purkis, **"we have continuously improved our processes, and today keep fine-tuning to reach optimum levels. We have outstanding operators, whose tremendous work and pride in the plant makes it one of the very best in the business".**

He continued: **"With our onsite labs, we are constantly testing, carefully balancing and maintaining levels; knowing the whole time that our digesters are being comprehensively mixed by a safe and very robust system".**

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In what has become a real science at innovative Eco, half of the clean, renewable energy (12,000 MW per annum) is utilised by the neighbouring Dorchester Feed Mill; (owned by the Mole Valley famers co-operative) the first feed mill in the UK to be powered completely by renewable power. The other 50% from the 2.5 acres site is sold to the National Grid. From its nutrient-rich digestate, Eco also produces and supplies a diverse range of sustainable landscaping products that return goodness back into soils.

Having both digesters mixed properly is crucial

Ed Johnson, Eco's AD Manager, said: **"Even when you are running a plant with relatively low solids (4-6%) as we do, effective mixing is very important. Even a five percent rise in our production can mean an extra £200,000 in PPA (purchase power agreements). As part of our ongoing drive to maximising production and be one of the best performing plants in Europe, we have upgraded our screening, but having both digesters mixed properly is crucial. The Landia system is very good and robust. It doesn't require rebuilds. We also have no issues in obtaining spares".**

No issues in eight years. Digesters completely mixed

Eco's Site Supervisor, Antonio Rodrigues, has been at the site near Dorchester since day one. Together with his colleague, Filipe Evora, they said: "**in eight years, the Landia digester mixing system has been brilliant. It's a great idea. Apart from replacing a couple of solenoids, we've had no issues in eight years. We know that our digesters benefit from being completely mixed**".

As such a successful operation that has already recycled over 4,000,000 tonnes of organic material, it is no surprise that family-run Eco Sustainable Solutions is looking to expand with a new biogas facility to add to its plant near Dorchester. As part of its firm ethos in providing a safer, happier and healthier working environment, mixing will continue to play an important part in the company's firm commitment to making its processes more carbon efficient.

Read more about the Landia GasMix here