TTV - Thöni High Solids Anaerobic Digestion
Lünen (Germany)

Principal and operator

RE TERRA

Plant data

Commissioned: 2019
Input: 22,000 t/a Bioabfall
Digester: TTV 1,450
Plant and Process

At this site (Remondis-Lippewerk Lünen), a total of 75,000 mg/a of organic waste amongst others from the district of Unna are processed: overall, about 55,000 mg/a of biowaste and 20,000 mg/a of green waste are processed. In the newly integrated anaerobic digestion stage, 22,000 mg/a of biowaste and green waste are fermented as a partial flow.

During pre-treatment the delivered biowaste is shredded, metals separated, then sieved and screened. The input material is then transported by crane system to a buffer-bunker to be continually fed into the digester. From there, the substrate is fed into a feeder unit with mixer where the fresh substrate is biologically inoculated and then fed via a substrate heat exchanger to ensure an ideal operating temperature as it enters the digester.

The fermentation process in the so-called plug flow digester is based on an anaerobic, thermophilic and entirely biological process. With an average retention time of about 21 days, hygienisation of the material is guaranteed. The Thöni rotating paddle agitator within the digester ensures a uniform and constant fermentation of the substrates. The special configuration of the agitator allows for 100% prevention of sedimentation, while continually transporting sediments to the digester discharge, while at the same time preventing the formation of floating layers and ensuring a high and uniform gas yield.

The resulting whole-digestate is fed via a mixer system directly into the process-stream of the existing intensive composting facility.

The biogas produced in the digester is initially fed into a gas storage and from there it is fed into the gas cleaning system and subsequently into the combined heat and power (CHP) units. The electrical energy generated in the CHPs is consumed at the site and any surplus is fed to the local power grid. The co-generated thermal energy is used to supply the digester, the gas heating and the business buildings with process heat.

Performance data

| Input: 22,000 t/a of biowaste & green waste |
| Output: 19,420 t/a of fermentation residue directly into composting |
| Raw biogas: about 1,999,000 m³/a |
| Expected electricity yield: 5,000,000 kWh/a |

This equals the annual electricity requirements of more than 1,500 households.