TTV – High solids anaerobic digestion from Thöni
Brandholz (DE)

Customer
Rhein-Main Deponie GmbH

Plant data
Commissioning: 2016
Input: 25,000 t/a biowaste, green waste
Power el.: 753 kW

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Plant and Process

On arrival at site, the input material is deposited in a flat bottom bunker. The biowaste together with the green waste is then transported to the pre-treatment unit (consisting of a shredder, a metal separator and star screen) by means of a wheel loader where residuals such as plastics, stones, metal parts etc. are removed.

Afterwards the separated organic material is conveyed via belt conveyors to the storage unit. From there the biowaste goes - via a fully automated conveying unit - into a mixing unit (dosing device) which assures the homogenisation of the material. Thereafter, the substrate is fed by means of piston pumps via heat exchangers into the digester.

In the entirely closed digester, microorganisms transform the latent energy of the organic material under anaerobic conditions (= exclusion of oxygen) into biogas. Residence time in the thermophilic digester is approx. 18 days.

At the end of the digestion process digestate is removed from the digester and pumped to the screw presses where it is dewatered. A proportion of the liquid is recirculated in the digestion process and used for humidifying the fresh input material. The remaining part of the liquid digestate is stored in tanks and used as fertilizer in agriculture. The solid fraction undergoes a further aerobic composting process in enclosed composting units.

The biogas produced during the digestion process is converted to thermal and electric power in a cogeneration unit (CHP). A proportion of heat is used for process heating and for the adjacent treatment buildings. The electrical power goes to the public grid.

Performance

Input:
25,000 t/a biowaste, green waste

Output:
High quality fertilizer (liquid):
11,000 t/a used in agriculture

High quality fertilizer (solid):
14,500 t/a

Raw biogas:
3,000,000 m³/a

Power production:
6,500,000 kWh/a

Corresponding to
annual power requirement of 1,500 households

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