

TRAINING MATERIAL

Title:

Technology for N&P recovery as compost starting from vegetable, fruit and garden wastes with "IOK Afvalbeheer" anaerobic digestion and composting process (ID: 271)

Training:

What is the technology?

Thermophilic predigestion of VFG (vegetable, fruit and garden) waste followed by composting controlled, biological aerobic breakdown and stabilisation of organic matter)

Who is the vendor of the technology?

The machinery used by [IOK Afvalbeheer](#) for the different anaerobic and aerobic digestion-steps includes mainly a shredder and crane - paddle wheel - conveyor belts - drum sieve (with 2 sieves) - Dranco dry thermophilic anaerobic digester - CHP engines, and - membrane technology.

Which are the advantages of the technology and the problems addressed?

The pre-digestion leads to energetic recuperation in the form of biogas (for CHP-based production of green electricity and heat) which can be upgraded to biomethane (for natural gas grid-injection and/or fuel use). Post-composting with green compost including (ensiled) roadside cuttings leads to a hygienised and stabilized end product - more particularly a certified high quality soil improver with slow release of nitrogen and other macro- and micro nutrients. Further upgrade of recuperation process possible/in progress by capturing carbon dioxide (available through biogas upgrading) and using as nutrient in nearby greenhouses. The energetic and carbon/nutrient recuperation makes the process and the end product very sustainable with a very highly performing footprint (CFP)

How does the technology work?

Selectively retrieved VFG-waste is shredded, stripped of impurities (iron, glass, plastics), heated with steam and fed into a dry thermophilic anaerobic digester (OWS) that yields digestate and biogas which is partly used as a fuel for 2 CHP's (combined heat and power-motors Jenbacher and MAN) in situ. The biogas is upgraded via membrane technology for gas grid injection. The minerale-rich digestate is mixed with (sieved, de-ironed and shredded) green waste in an intensive composting process: this aerobic digestion phase in a closed hall mimics the natural conversion process from organic matter to humus in the soil (humification). This composting is a controlled proces lasting a minimum of 4 weeks with minimum 3 turns, after which sieves (16mm) are used to separate the compost from the overflow fraction (recirculating to shredder/start of composting process).

To ensure hygienisation of the end product (VFG-compost) the following minimum temp/time-ratio's are upheld and controlled: thermophile digestion of min 2 consecutive weeks >50°C, followed by min. 2 weeks composting at min. 45°C of which min. 4 days at min. 60°C or min. 12 days at min. 55°C. The sieved matter (<16mm) further post-composts and matures, including further turning of the piles, outside for about 8 – 10 weeks.

How/where to use the technology?

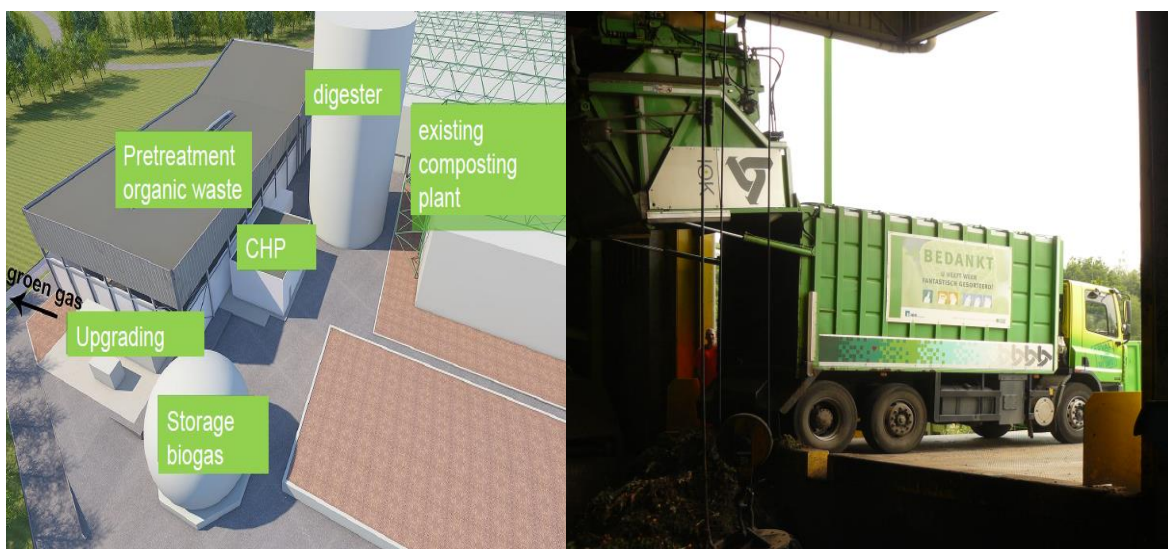
With this VFG-predigestion and composting technology (inter)municipal VFG-, green and other organic-biologic wastes (e.g. firms, events,..) are professionally revalorized (energy, nutrients and carbon) rather than incinerated, piled up or incinerated. This robust technology can be used in all EU regions where VFG and green waste are selectively retrieved and where policy regards soil depletion and green energy as important topics.

Authority permits?

Typically an environmental license/permit for installing this technology will have to be asked & obtained from the local authorities. Environmental license categories classify composting sites in class 3 (max 25m³ composting capacity), class 2 (between 25m³ and 2000 m³ capacity) and class 1 (> 2000 m³ capacity). In Flanders an 'omgevingsvergunning' will be required from the Department of Environment, taking into account BAT (best available technologies) guidelines and recommendations of other advisory bodies.

How much does it cost?

Total CAPEX of abovementioned machinery: 13.000.000 euro (incl. VAT and funding). Based on OVAM-studies (2000, 2002, 2013¹) and VITO's BAT document (2005) an intermunicipal OPEX cost price varies between conservatively 60 - 80€/ton waste for VFG composting (including retrieval) and 140 – 160 €/ton waste for VFG-digestion+post-composting (incl retrieval).





For more information: https://nutriman.net/farmer-platform/technology/id_271