DE-HUMUS

Decentralised humus production by emission reduction and controlled waste treatment with additional energy production

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INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output of a project co-funded by the European Commission within the framework of the Competitive and Innovation Program. This solution has been developed by a team coordinated by Müller Environmental Technology (Austria) in partnership with Drava Water Management Company (Slovenia), iC Consulting (Croatia), Pöttinger Waste Disposal Technology (Austria), Dennis Piatek (Poland), Wilhelm Drexler (Austria).

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

This solution consists of modular equipment to treat small amounts of organic waste (1,000t/a – 5,000t/a) to produce and convert humus into soil conditioner, fertilizer and energy (electricity and heat). The 3A-biogas process is a combined composting and digestion process to treat organic material with high dry matter content. The equipment can be operated with different kinds of waste (mixed waste , sorted waste, food industry & agricultural waste).
All modules are designed as a container system to increase modularity and transportability, which allows regional treatment of organic waste and the possibility of active reaction to changing waste quantities. The solution is already available on the market and has been installed at several locations.

INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

38 Waste collection, treatment and disposal activities; material recovery

INDUSTRIAL CLASSIFICATION - NACE CODE;

01-09 Agriculture, Forestry, Fishing

1. DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

The organic waste treatment technology consists of several containers (modules), 1 control module, up to 10 process modules and bio filter equipment. The smallest unit includes 1 control module, 1 process module and bio filter equipment and processes 1,200t organic waste per year. The system can easily be increased by adding additional process modules. The process modules are designed to treat all kinds of organic waste. The modules are manufactured in compliance with transportation by normal trucks. Methane will be produced and converted into electricity and heat during three phases.

The final output is:

- humus production from all kinds of organic waste material, to increase the topsoil/humus proportion and avoid land erosion;
- decentralised humus allocation of small waste quantities including reduction of transportation costs and emissions; humus utilisation to substitute chemical fertiliser and close natural circuits (e.g. phosphorus, carbon) to increase resource efficiency;
- advance recycling management to guarantee an optimal use of resources

Each process cycle inside the container takes 3-5 weeks. The technology is very stable as the equipment has no moving parts and little maintenance is required. Electricity generated depends on the organic waste quality, with an electrical power generation ranging between 20-30kW for a system of 3 modules.
The equipment can be installed within one week. Required infrastructure is an electricity line. There is no similar equipment available in Europe.

Economic and environmental benefits of the eco-innovative solution

Costs of the technology – the smallest equipment of 1,200t/a costs €500,000; the solution is module based and the more fermenter the cheaper the entire solution; e.g. for a solution with 10 containers and a process quantity of 4,000t/a, costs are around € 1,100,000; return on investment for existing equipment installed in several EU countries is less than10 years and depends on feed-in tariffs for electricity, possible usage of waste heat, costs of the organic waste, costs of substituted fertilisers and humus usage.

For the smallest unit a potential saving on chemical fertilisers (3,600kg nitrogen (N), 1.100kg phosphorus (P), 3,200kg potassium (K) and 11,200 kg calcium (Ca)) is guaranteed in the produced humus (400t). In addition 165,000 kWh electricity and 320,000 kWh thermal energy will be generated.

2. AVAILABILITY OF THE ECO-INNOVATIVE SOLUTION AND BUSINESS PARTNERSHIP

Market readiness, Trade mark, existing market coverage, commercialization strategy

The solution is ready for full scale deployment. All modules are designed as a container system to increase modularity and transportability, which allows regional treatment of organic waste and the possibility of active reaction to changing waste quantities. There are currently 11 units installed in Europe (Croatia, Poland, Austria, France), for residential organic waste, agricultural organic waste (cattle and horses) and the food industry.

Trade mark: Mobigas

Requirements to adapt the solution to the local market and potential applications/market size

Electricity supply is needed on-site

On-site after-sales services support and the technical assistance requirements

There is already a world-wide network available to cover on-site service in the target countries, however, partnership could also include engineering partners who cover on-site support.

Targeted local business partners

Engineering company to design and install industrial equipment for the food industry, agricultural businesses or businesses which generate organic waste

Type of local business partnership sought

Commercial agreement for design, installation and maintenance services.

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UNIDO UNEP MAP Regional Activity Centre for Sustainable Consumption and Production