

Compomar: Pyrolysis & Bio Activated Fuel Reactor

Development Plan Summary (Plateau de Saclay, Essonne County, France)

Overview: Compomar, a company processing plant waste into compost, sought support from the BioenNW project to produce biochar to avoid the leaching of nutrients and to increase soil water retention. The vision would be for biochar mixed with compost to replace manure.

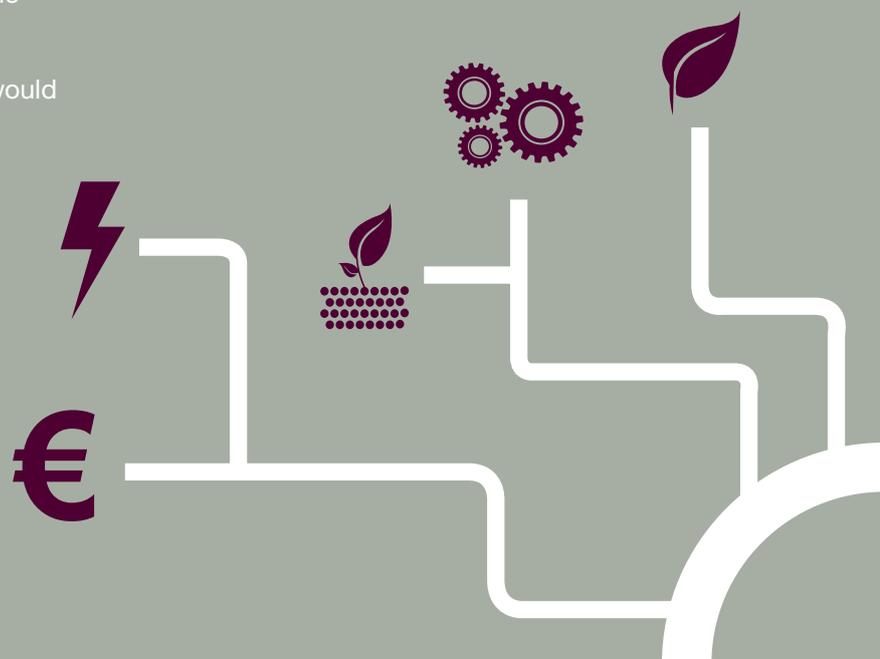
Project detail

Compomar, founded in 1992, is located in Saclay in the Essonne county of France. It processes 16,000 tonnes of plant waste from its surrounding local authorities and landscape gardeners. In turn it produces around 7,000 tonnes of compost per year – part of which is used locally – and the remainder is sold to landscape gardeners or private individuals. The company is managed by Emmanuel Laureau who also has a 230 hectare farm on which products such as wheat, corn and flax are grown. These two activities are independent. In order to address the sand and silt quality of his land, Emmanuel Laureau would like to spread biochar on his land (produced from Compomar oversize compost), amounting to 800 tonnes per year with a water content of 20-30%. An alternative process is sought to treat the latter – currently used in biomass boilers which is problematic at present. Compomar compost characteristics are already known. Compomar would need to characterise their oversize compost, which could be supplemented by other wastes if appropriate.

Compomar occupies 25,000 m² and comprises a run off catch basin of 1,500 m³, grinding, crushing, screening machines and several warehouses.

The biochar would be mixed with compost to create a substance containing an appropriate amount of nitrogen, phosphorus, exchangeable

potassium and magnesium oxide for cultures. The biochar would be produced using a Pyroformer™ – a patented technology developed by the European Bioenergy Research Institute (EBRI) at Aston University, UK. This technology uses intermediate pyrolysis, which heats feedstock between 400°C and 500°C without oxygen being present. The process creates biochar, gas and oil. The Pyroformer™ can also be complemented by a Bio-Activated Fuel (BAF) reactor, which purifies the gas fraction generated by the Pyroformer™. Pre-treatment would include feedstock shredding to approximately 5 mm to ensure consistency and potential drying. Pyrolysis of 800 tonnes of oversize compost per year could produce 240 tonnes of biochar, 400 tonnes of gas and 160 tonnes of bio-oil, totalling 3,175 MWh per year.



Investment

The capital and operational costs need to be taken into account. These include the investment required for feedstock storage, pre-treatment, the Pyroformer™ and BAF units and associated equipment, as well as operational and maintenance costs.

The production of biochar would also require investment for storage, pre-treatment, the Pyroformer™ unit (and associated equipment) and gas treatment.

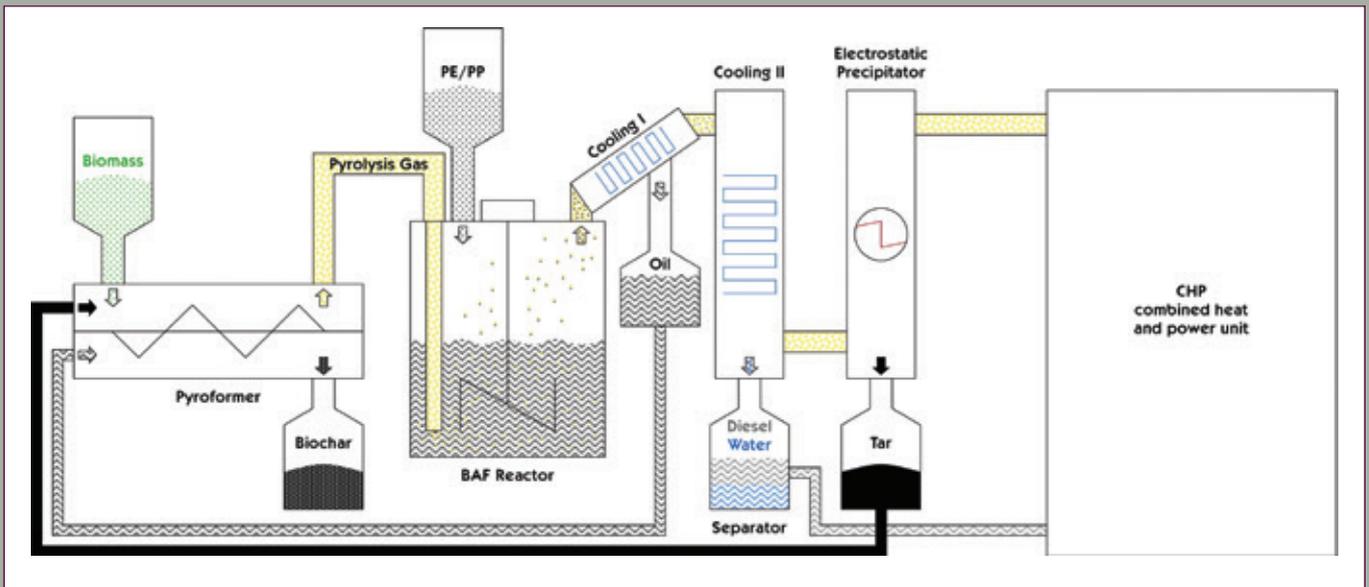
Revenue

Pyrolysis of oversize compost would generate three products: biochar (to be used in co-firing, mixed with compost as soil conditioner or on its own), oil (to produce heat/electricity or for use in the chemical industry) and non-condensable gases (to be used as fuel in boilers).

The biochar produced by Compomar would be either used mixed with compost as a soil conditioner by Emmanuel Laureau or tested on its own on a 3 – 4 hectares land. The implementation of this technology would enable the production of 7,100 tonnes of mixed

compost/biochar (at 1%) at an estimated cost of €20 euros per tonne, with a total sales value of €142,000.

This development plan has been produced through BioenNW – a €7.9m strategic initiative of the European Union INTERREG IVB North West Europe Programme (2011-2015). BioenNW is led by the European Bioenergy Research Institute at Aston University, UK and sees 11 partners working together to deliver small-scale bioenergy schemes throughout North West Europe.



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