PROTECTOR

First industrial application of eco-innovative biotechnological process and products, for recycling and re-using food industrial waste as economically important and high added-value farming products

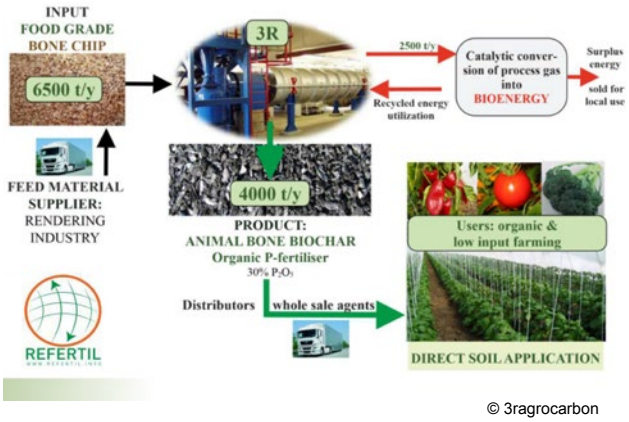
TERRA HUMANA TISZTA
Technologiakat Fejleszto-
Tervezo Es Kivitelezo
Kisfaludy Utca 2 Vi Em 17
1197 BudapestKözép-Mayarország.
Hungary

www.3ragrocarbon.com

Mr. Edward Someus

edward.someus@gmail.com

+36-20 201 7557



INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output from the project titled “Eco-friendly high performance fiber composite material” 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 Terra Humana (HU), in partnership with the Agricultural Office of Country Fejer Plant Protection (HU), Edudes Chimiques et Physiques (F) and Plant Research International (NL). The project was finalized in 2012.

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

The eco-innovation consists of an entire industrial facility to process animal bone-meal and agricultural by-products into natural mineral fertilizers. The 3R, Recycle-Reuse-Reduce, is a zero emission low temperature carbonization (pyrolysis). The aim of the 3R Zero Emission Pyrolysis Process is the added value upgrading/valorisation of agro/food industrial organic by-products into safe and high-value soil amendment and nutrition products.

INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

01 Agricultural Production - Crops

INDUSTRIAL CLASSIFICATION - NACE CODE;

01 Crop and animal production, hunting and related service activities

1.DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

The core elements of the new technology consist of turn-key solutions, covering planning, technology design and equipment supply, for a pyrolysis process for reductive thermal decomposition of plant and/or animal origin biomasses. The pyrolysis of biomass substances produces solid residues rich in carbon content “biochar” and separated volatile crude pyrolysis gas, which may be condensed into liquid crude oil and non-condensable gases. Input materials consist of category 3 and 2 bone meal animal by-product (all types) and phosphate recovered from food grade animal bone and sea food by-products (fish bone, calcareous mollusc shells, crust shells of crustaceans). Output consists of organic P/C fertilizer at 200-1,000 kg/ha dose rate and growing media coverage in the horticultural sector. In addition the high carbon content plant based biochar usually improves soil at approx. 5,000-20,000 kg/ha dose rate for water/nutrient retention and carbon sequestration applications.

Economic and environmental benefits of the eco-innovative solution

The recommended size of the plant should allow a yearly throughput of 20,800 t/yr, using the input of 30-50 suppliers. Investment costs are estimated at €5Mio; payback, 3 years. It is calculated that the EXW production costs (i.e. where the solution is ready for pickup at production place and all other transportation costs and risks are assumed by the buyer) of mineral fertilisers are 1.8 – 2.4 €/kg P, while the end-user price to farmers is around 2 times higher after adding marketing and distribution costs. It is calculated that the EXW production costs of the innovative and recovered phosphorus fertilizer is approx. 2.1 – 2.4 €/kg P (before marketing and distribution costs).

The obtained animal bone based biochar or “bone char” is free from toxic elements and has approx. 30 % P2O5 content. This highly recovered phosphorus content makes it suitable for use as a slow-release natural fertiliser, substituting for mineral phosphate fertilisers.

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

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

There is one pilot plant installed in Hungary. Trade marks available: 3R ; ABC, Protector

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

The solution includes the planning and installation based on local requirements. In addition, in Europe there is a mandatory requirement to get a permit to install/operate a pyrolysis plant and it is mandatory to get a permit to commercialize and commercially use biochar (both plant based and animal bone biochar) in agriculture in any production ranges. National legislation/permits requirements should be verified.

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

After sale service from Hungary

Targeted local business partners

Large fertilizer producers who intend to introduce an organic product line

Type of local business partnership sought

Franchise

SwitchMed Programme is implemented by the United Nations Industrial Development Organization (UNIDO), UNEP Division of Technology, Industry and Economics (DTIE), UNEP Mediterranean Action Plan (MAP and the Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC).

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