



PROTECTOR (ECO/08/238984)

*First Industrial application of eco-innovative biotechnological process and product, for recycling and re-use of food industrial waste to economically important and high added value farming products
(2009 - 2012)*

CASE STUDY

**Coordinator: Edward Someus
TERRA HUMANA LTD.**



Edward Someus - <http://www.3ragrocarbon.com>



BASIC PROTECTOR BASIC INFO

- **TARGET:** Engineering, design, manufacturing, installation and **FIRST INDUSTRIAL APPLICATION** of a 4000 litre/week capacity PROTECTOR Solid Substrate Fermentation and Formulation System (SSF). Real life test production of 25 tonnes PROTECTOR products.
- **Coordinator:** Edward Someus / Terra Humana Ltd.
- **Partners:**
 - Stichting Dienst Landbouwkundig Onderzoek – DLO (Netherlands)
 - Fejér County Government Directorate of Plant Protection and Soil Conservation (Hungary)
 - ECP - Chemical and Physical Studies (France)





COORDINATOR INTRO

- **International leader SME company** for scientific RTD and industrial design of Pyrolysis (carbonization) and integrated organic waste recycling technology since 1989.
- **CORE COMPETENCE:** Pyrolysis, nutrient recycling, processing of animal and agri by-products.
- **Coordinator and key technology designer** of FP5, FP6 and Ecoinnovation projects since 2002.
- **Knowledge in EU Funding programmes.**





PROTECTOR CONCEPT

PROTECTOR is a Natural Phosphorous recycling and reuse **ZERO EMISSION PROCESSING** and **CARBON NEGATIVE APPLICATION** technology, for economical conversion of agri/food waste bio-resource streams to high added value natural products.





PROTECTOR DRIVERS

- SME organization implementing **objective driven own innovation development results**.
- Targeting achievement of **competitive business and international market advantages** in short term <3 years.
- **Targeting financial independence** from banks/investors in market replication initial phase, so better business position and added value can be achieved at large industrial phase.
- **Improved risk management** by demonstrating small industrial replication phase.





PROTECTOR INPUT - OUTPUT

INPUT MATERIALS

Bone meal



Bone charcoal



Biotech formulation



500x enlargement



The **INPUT FEED STREAM** is low value animal by-products; such as high Phosphorous mineral content food grade animal bone meal.

The added value **OUTPUT PRODUCTS** are: High economical value **HIGH P CONTENT BONE CHAR** and biotechnologically formulated product for wide range of agri (natural P mineral fertilizer, plant growth promotion and enhanced biocontrol effects) applications.





INTEGRATED 3R TECHNOLOGY

The revolutionary 3R invention provides **ZERO EMISSION PYROLYSIS THERMAL PROCESSING** for high temperature conversion of organics into bone char mineral, with **INTEGRATED BIOTECHNOLOGICAL PROCESSING** (solid state fermentation and formulation) into high added value, **SAFE natural Phosphorous FERTILIZER** and soil improver low input farming products.



PYROLYSIS EQUIPMENT

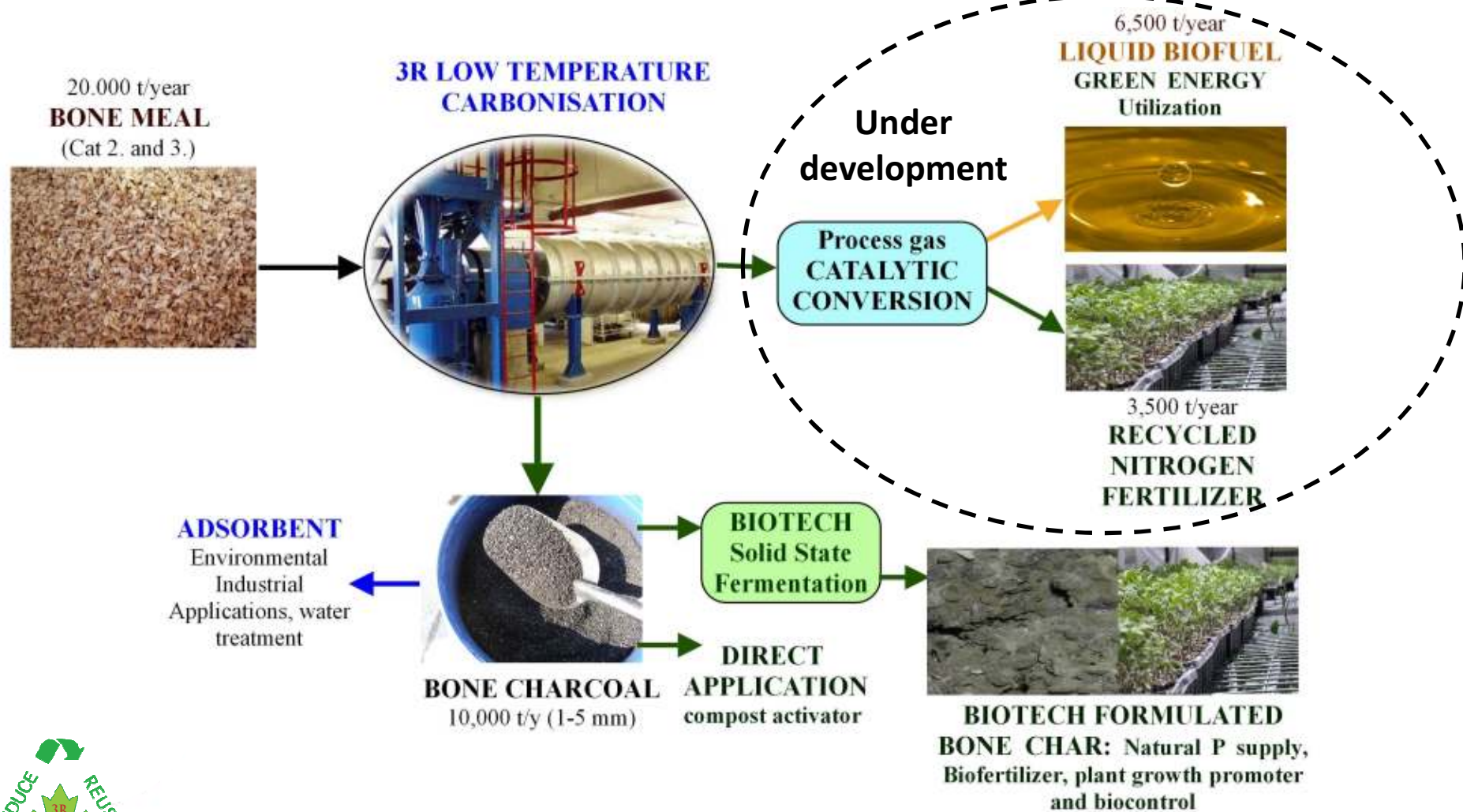


LIQUID AND SOLID FERMENTATION





ANIMAL BONE MEAL RECYCLING





COMPETITIVE ADVANTAGES

- 1. High added value valorization** of animal by-products/organic waste into board range of market demanded and customer oriented end-products.
- 2. High input feed flexibility.**
- 3. No exotic technical solutions/materials.**
- 4. Energy self sustaining** (independent from fossil energy).
- 5. Low operational and maintenance costs.**





MAJOR PROJECT OUTPUTS

MAJOR OUTPUT = FIRST INDUSTRIAL APPLICATION

- Engineering, design, manufacturing, installation and **FIRST INDUSTRIAL APPLICATION** of a 4000 litre/week capacity PROTECTOR Solid Substrate Fermentation and Formulation System (SSF).
- **REAL LIFE TESTING** of PROTECTOR technology for 18 months duration and additionally 6 months industrial demo testing for potential licensing and market replication partners.
- **REAL LIFE TEST PRODUCTION** of 25 tonnes animal bone charcoal from food industrial waste and **25 tonnes PROTECTOR** high added value farming substance by innovative SSFF.

END RESULT= PROTECTOR MARKET REPLICATION and LICENSING





ECO PROTECTION POTENTIAL

- **Protecting ecosystem:** Cost and energy efficient organic waste conversion with zero emission process performance.
- **Improving resource efficiency:** converting waste into valuable resources:
 - low energy input **recycled Phosphorus fertiliser** without fossil fuel input,
 - cadmium and heavy metal free **natural and renewable P fertiliser**





DISSEMINATION STRATEGY I.

- Preparation of detailed investor oriented **business and financial plan.**
- Clear determination and **understanding of market need.**
- Presentation and **participation in conferences and investment forums.**
- **Contacts and discussion with financial actors.**
- **Increased visibility towards the investors:**
 - Investor oriented web page
 - Increased electronic communication
 - Creation of business networks and groups (e.g. **Linkedin Group and others**)





DISSEMINATION STRATEGY II.

- **PERSONNAL & ELECTRONIC COMMUNICATION WITH INVESTORS AND STAKEHOLDERS**, newsletters, project web site (www.3ragrocarbon.com/protector)
- **Demo site visit**: test production
- **PRESENTATION FOR CLEAN TECH INVESTORS:**
 - Clean Tech Investment Forum, selected for presentation. (22 September. 2010, Vienna)
 - Eurecan European Venture Contest Semi-Final, selected for presentation. (23 November, 2010, Warsaw Stock Exchange)
- **EU GATEWAY Business mission participation:**
 - Korea (2010), Japan (2011)





MARKET UPTAKE BARRIERS

- The RTD is post development and prior industrialization, set in the „**no mans land**“, still considered as risk investment due to lack of large industrial reference. No sales reference.
- **The EU programmes can not be used as solid reference**, as lack of investors information related to the EU FP5, FP6 and Ecoinnovation programmes and results of these funded projects.
- **Investors are requesting high quality and detailed (costly) financial- and business plan.** We need to learn own business plan writing and financial projection (ROI, CAPEX, etc.) techniques.
- **No SME friendly national funding** possibilities for SMEs.





PROTECTOR MARKET REPLICATION

- Specialized for animal by-product high added value integrated processing and reuse: **few International competitors.**
- **The small industrial scale CIP-ECOINNOVATION replication has been achieved** as foreseen, which result is an critically important starting platform to next large industrial expansion.
- **Large industrial scale (20,000 t/y throughput) designed and targeted as next step 2012/2013.**
- **Business and market objective:** <2020 control majority of the world bone char market (require 3 industrial units).





ISSUES FACED AND LESSON LEARNT

- **The human resource quality and performance is critical.**
- **Need objective driven set up:** money never starts an idea; it's the idea that starts the money. „If you don't know where you are going, every road will get you nowhere” (Kissinger).
- **The technical „Devil” is in the details.** But „in the middle of difficulty lies opportunity” (Einstein).
- **Do not underestimate the challenge.**
- **The initial marketing cost for a new product and market intro may cost even more than the development itself.**





THANK YOU!

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