

*Converting rendering by-products into
added value
natural products and resources*

CASE STUDY

***Edward Someus
TERRA HUMANA LTD.***



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

COMPANY COMPETENCE

- 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.



3R ZERO EMISSION RECYCLING

- **OBJECTIVE:** added value upgrading and valorisation of animal by-products into safe and useful soil amendment products by integrated thermal/biotechnological and catalytic zero emission recycling means .
- **3R PROCESS:** Indirectly heated horizontally arranged **pyrolysis rotary kiln** ($T = <850^{\circ}\text{C}$, in vacuum), directly integrated with biotech system.
- **OUTPUT PRODUCTS:** **natural phosphorus, recycled nitrogen fertilizer, green energy .**

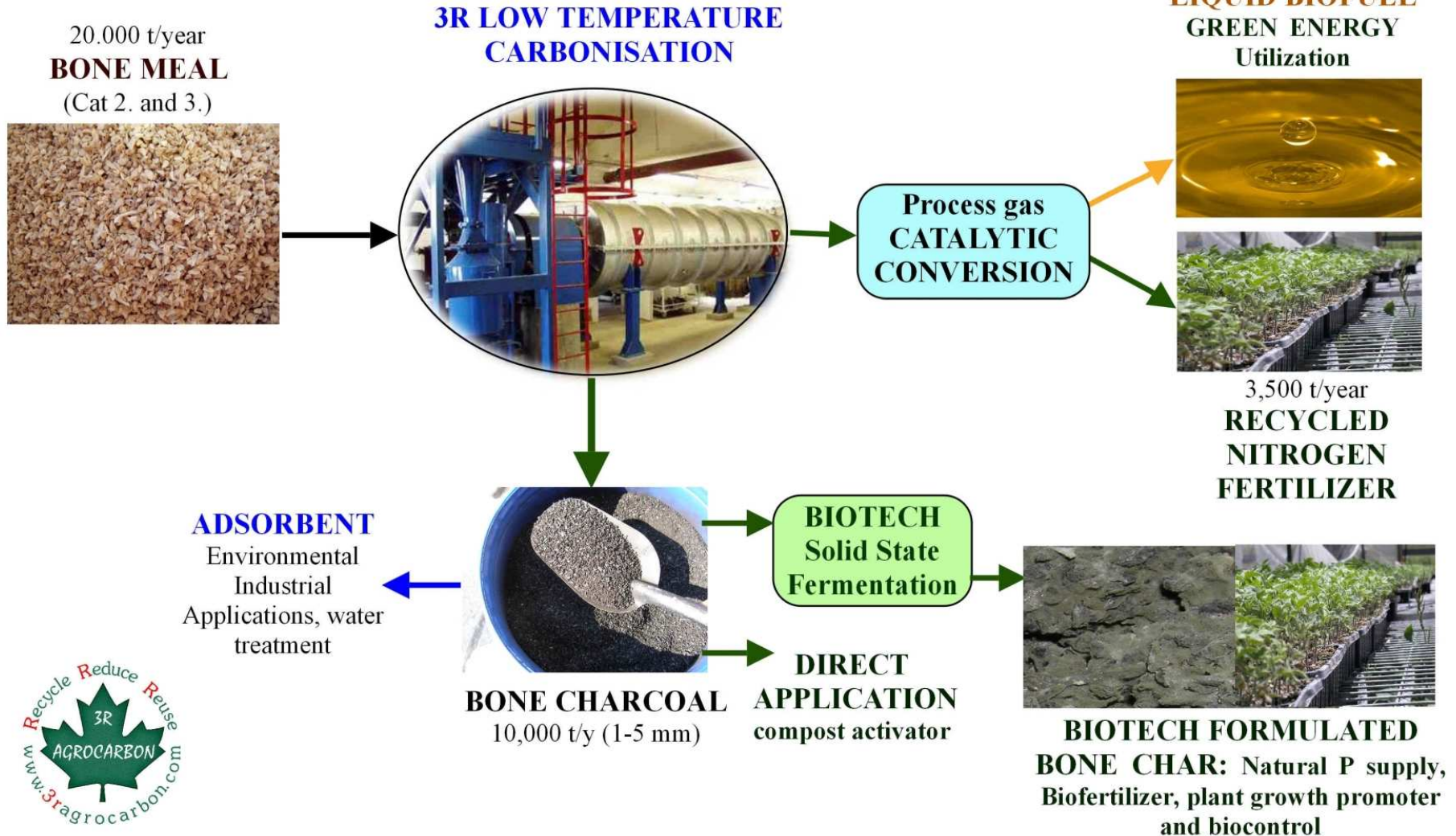
THE 3R CHARACTERISTICS

- **Indirectly heated horizontally arranged pyrolysis (thermo-chemical process) rotary kiln. $T = < 850^{\circ}\text{C}$, in vacuum.**
- **Advanced and economical biomass-to-liquid fuel and refined carbon material (bonechar) processing technology.**
- **Comprehensive industrial design.**
- **EU FP5 and FP6 RTD project references background.**



ANIMAL BONE MEAL ADDED VALUE RECYCLING STRATEGY

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GREEN ENERGY LINE

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5,500 t/year
**RECYCLED
N - FERTILIZER**
For horticultural
production



10,000 t/year
LIQUID BIOFUEL

**POWER
GENERATION**
2Mwe/h

TRANSPORT
Quality
Bio-oil

20.000 t/year
Meat and Bone Meal
(Cat 1.2.3.)



**3R LOW TEMPERATURE
CARBONISATION**



Process gas
**CATALYTIC
CONVERSION**

**RECYCLED
ENERGY**

4,500 t/year
**SOLID FUEL
CLEAN BURNER**



**BONE ASH
CHINA BONE
porcelain**



The environmental protection potential

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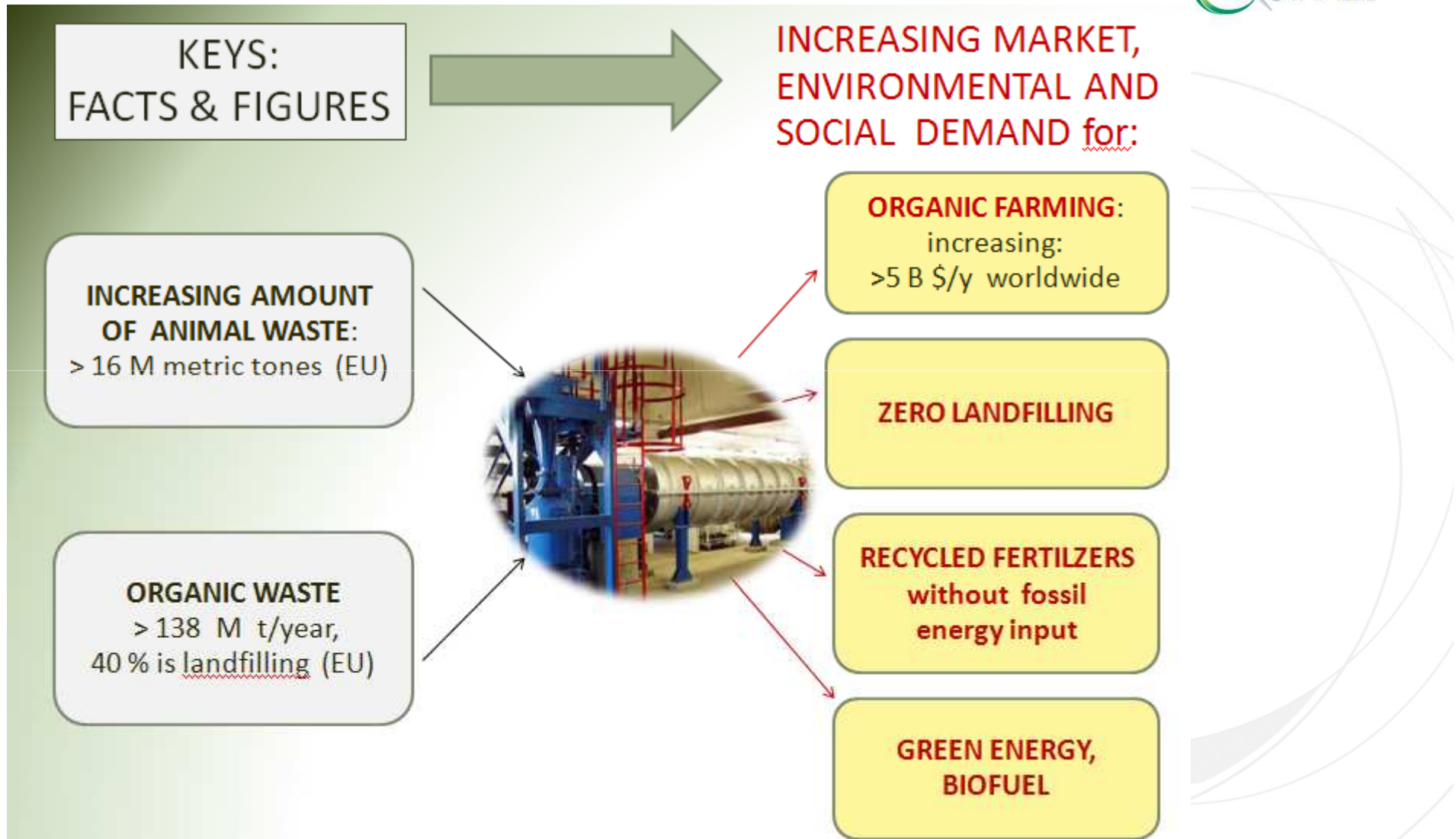
- **Protecting ecosystem:** Cost and energy efficient organic waste conversion with zero emission process performance.
- **Improving resource efficiency:** converting waste into valuable resources:
 - low energy input **recycled N-fertiliser** without fossil fuel input,
 - cadmium and heavy metal free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

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Converting waste into valuable resources

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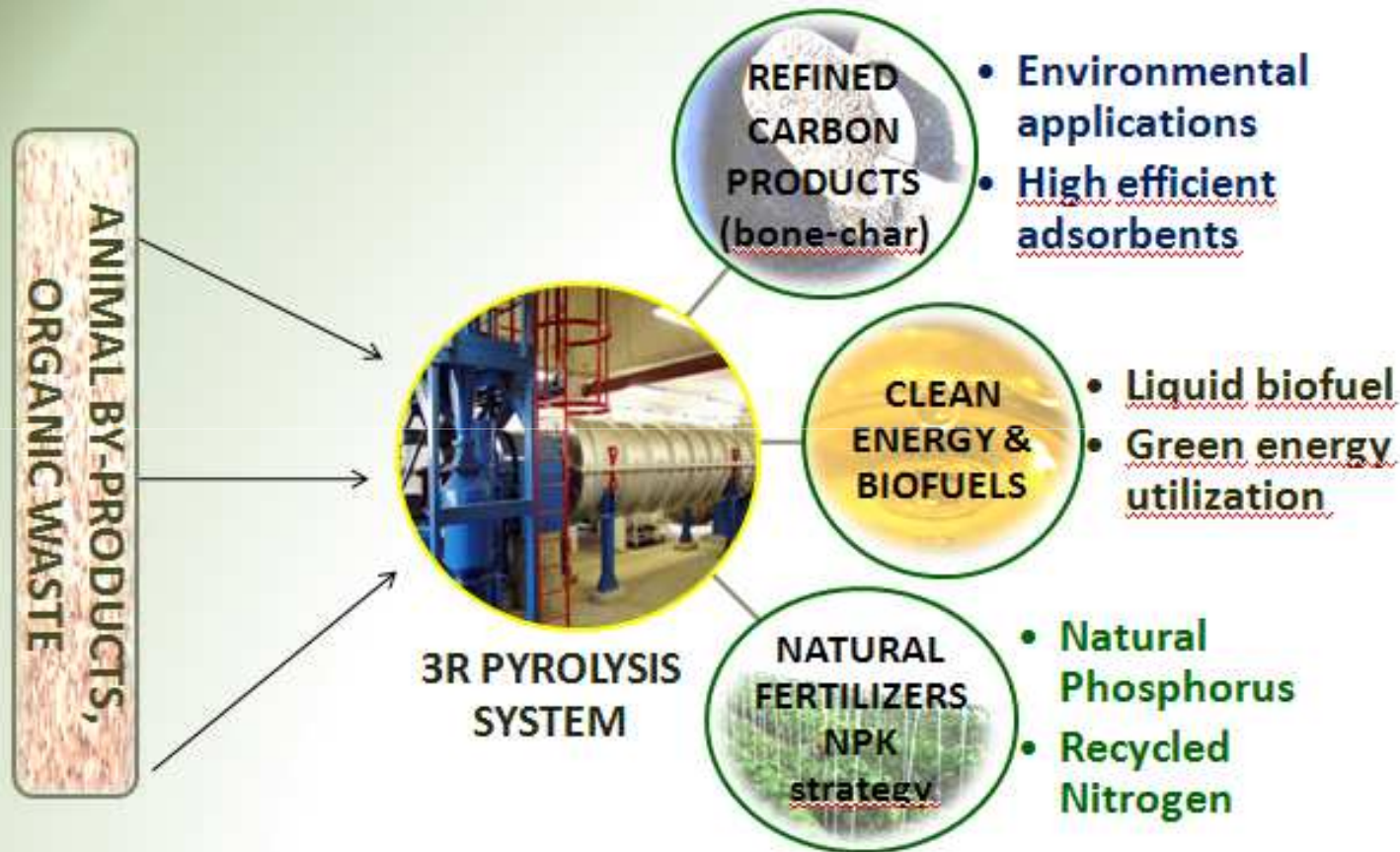
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COMPETITIVE ADVANTAGES

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

MARKET & BUSINESS OPPORTUNITIES

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HIGH MARKET DEMANDED PRODUCTS TO THE ENVIRONMENT – GREEN ENERGY – AGRICULTURE SECTORS

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Partners & Customers - Competitors





FUNDING HISTORY

PROJECT COORDINATION & KEY TECHNOLOGY DESIGN:

- **EU FP5- NNE5-363-2001 – MULTI FUEL** (2002-2005), Total project value : € 2,248,440, EC contribution: € 1.432.889
- **Food 2005-514082 – PROTECTOR** (2005-2008): „Recycling & upgrading of bone meal for environmentally friendly crop protection and nutrition”. Total project value: € 2,660,000, EC contribution: € 1.657.403
- **ECO/08/238984 PROTECTOR** (2009-2012) – „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”. Total project value: € 1,190,050, EC contribution: € 699.034

PROTECTOR ECO-INNOVATION Project

ECO/08/238984

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- **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:**
 - Plant Research International B.V. (Netherlands)
 - Agricultural Office of Country Fejer Plant Protection and Soil Conservation Directorate (Hungary)
 - ECP - Chemical and Physical Studies (France)

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eco-innovation 
WHEN BUSINESS MEETS THE ENVIRONMENT

CURRENT FINANCIAL NEED

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ROUND I.
2011

- **€5 M investment demand** for 20,000 t/y production installations in West HU.
- **Targeted:** horticultural farming + liquid transport biofuel sector.
- **ROI 2 years, EXIT 3-5 years.**

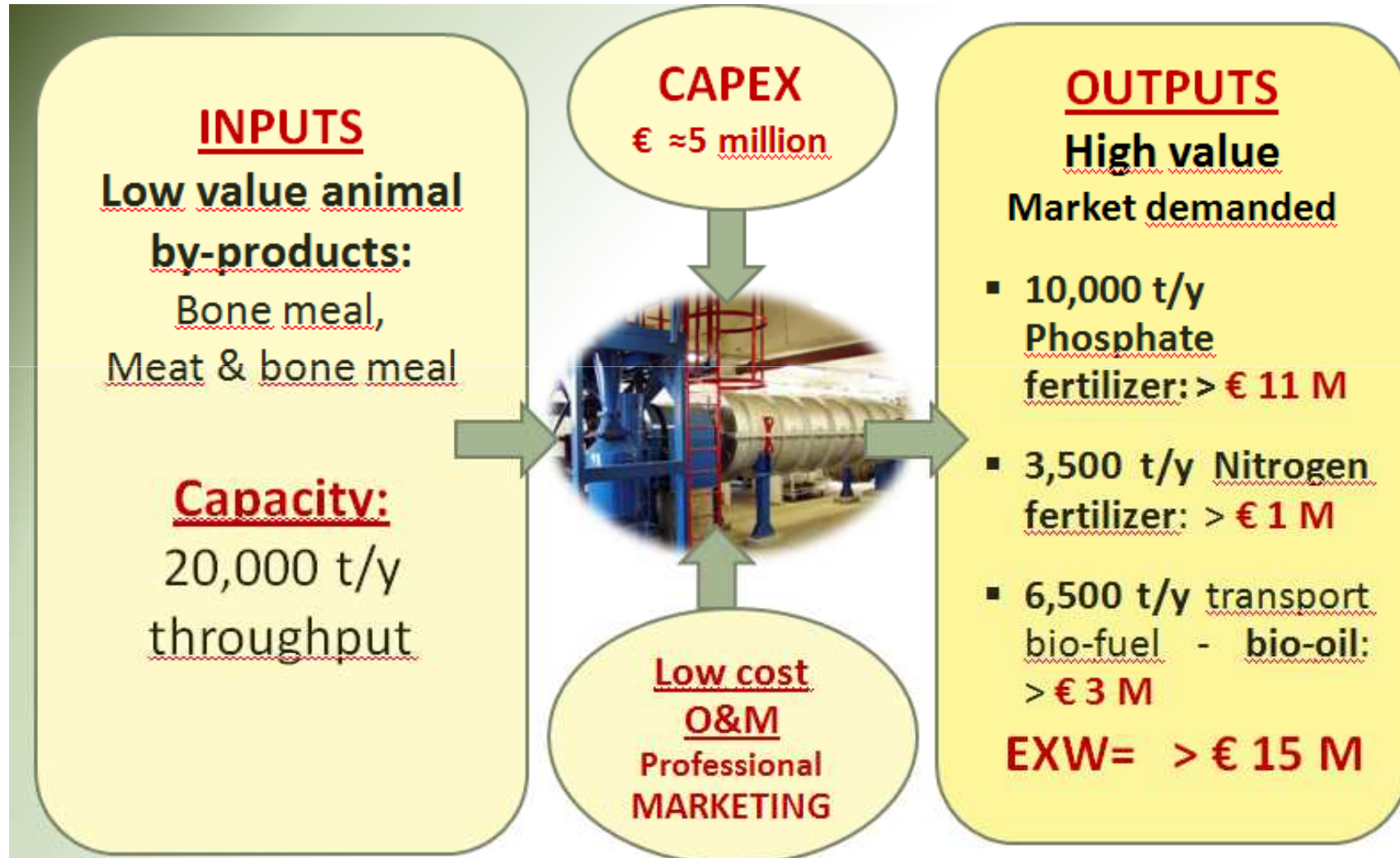
ROUND II.
2013

- **€50 M investment (2013-2015)** for international expansion.
- **GOAL:** cover >75% of EU bone char market next 5-7 years.

LOW RISK PROFILE with CLEAR MARKET UNDERSTANDING

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Capturing value from innovation



APPLIED STRATEGIES

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- 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 company web page
 - Increased electronic communication
 - Creation of business networks and groups (e.g. **Zero Emission Carbon Refinery LinkedIn Group**)

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BUSINESS PRESENTATION

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- **PERSONNAL & ELECTRONIC COMMUNICATION WITH INVESTORS**
- **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)

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BARRIERS FOR FURTHER INVESTMENT FUNDINGS

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- The RTD is post development and prior industrialization, set in the „no mans land”, still considered as risk investment due to lack of 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.
- **Insufficient national funding** possibilities for SMEs.

SUMMARY & CONCLUSION

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- **EU recognized pyrolysis development** for high added value processing of organic waste.
- Coordinator and key technology designer of FP5, FP6 and Ecoinnovation projects since 2002.
- **€ 5 million financial investment searched** in W Hungary for industrial input capacity > 20,000 t/y.
- **Increased visibility strategy** supporting business creation.
- Investors requesting clear, proven and documented IPR, market, financial/business strategies with low risk.

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THANK YOU!

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