

3R = combined applied science & industrial engineering for resource added value conversion

<http://www.agrocarbon.com> <http://www.refertil.info>



Terra Humana Ltd. is one of the leading international science, technology innovation and advanced industrial engineering organization in the field of carbon refinery and biochar processing for recovery of resources, most importantly Phosphorus and other nutrients. Advanced pyrolysis, carbonization, activated carbon and carbon biotechnological formulation developed. Refined and high added value carbon and biochar products derived from animal bone, coconut shells, nuts, brown-coal and other suitable feed material by-products. Horticultural low input/organic farming (formulated AVC Animal Bone bioChar), water treatment/reuse/recycling (adsorbents) and environmental industrial applications are targeted. Bio-energy production is also an important activity of the operations, including conversion of bio waste materials into clean energy.

**Terra Humana Ltd. (TERRA)**

Terra Humana Clean Technology Development, Engineering and Manufacturing Ltd.

Established: 1989 (HU-10254073) as SWE-HU joint venture Edward Someus – Lang  
Machine works (since 1870, now Alstrom subsidy)

Postal address: H-2472 Kajaszó, BIOFARM Pf.1, Hungary

**Laboratory:** 8154 Polgárdi, Gyula Manor, pyrolysis & biochar RTD and demo center  
(Central Transdanubian Region, M7 West 80 km, Hungary)

Conference center: H-2472 Kajaszó, BIOFARM Hungary <http://www.3rbiofarm.com>  
(Central Transdanubian Region, M7 West 33 km, Hungary)

Web: <http://www.3ragrocarbon.com>, <http://www.refertil.info>

EU:  [http://ec.europa.eu/research/bioeconomy/agriculture/projects/refertil\\_en.htm](http://ec.europa.eu/research/bioeconomy/agriculture/projects/refertil_en.htm)  
[http://cordis.europa.eu/ADS/PROTECTOR\\_514082\\_FINAL\\_REPORT.pdf](http://cordis.europa.eu/ADS/PROTECTOR_514082_FINAL_REPORT.pdf)  
[http://cordis.europa.eu/result/rcn/25625\\_en.html](http://cordis.europa.eu/result/rcn/25625_en.html)  
[http://www.ecoweb.info/842\\_first-industrial-application-ecoinnovative-biotechnological-process-product-recycling-reuse-food](http://www.ecoweb.info/842_first-industrial-application-ecoinnovative-biotechnological-process-product-recycling-reuse-food)  
<http://phosphorusplatform.eu> (member list, REFERTIL)

email: [biochar@3ragrocarbon.com](mailto:biochar@3ragrocarbon.com) or [edward.someus@gmail.com](mailto:edward.someus@gmail.com)

Skype: edwardsomeus

Tel: 0036 20 8054727, 0036 20 2017557

**EU PIC Code:** 999693447

**General manager, owner, innovator and key tech industrial engineering designer:**

Edward Someus (biochar S&T senior engineer) Sweden

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### Core competence:

- a) **Coal & Carbon:** reductive thermal science and industrial engineering, pyrolysis oil catalytic conversion and refining; activated carbon manufacturing from hard coal, coconut shell and nuts; biomass and brown coal added value conversions; qualified biochar production and applications; low carbon economy;
- b) **Soil science:** plant available Phosphorous & Nitrogen recycling, soil biotechnology, solid state fermentation and formulation, drought tolerant cultivation methods, biochar carbon offsets;
- c) **Climate change mitigation and adaptation,** carbon trading.
  - ✓ Applied environmental scientific RTD in the fields of **zero emission pyrolysis processing**, biochar, nutrient recovery and energy generation processing with integrated and united approach of the advanced thermal-biotech-chemical S&T,
  - ✓ Development of carbon negative reuse and economical applications of the market demanded recycled output products, most importantly biochar,
  - ✓ Phosphorous & Nitrogen recycling, including special core competence for animal bonechar – biochar production and applications,
  - ✓ Scale up, full scale industrial engineering and industrialization of zero emission performance reductive thermal processing pyrolysis technologies in any economical throughput capacity ranges,
  - ✓ Agricultural, food industrial and urban organic waste stream resource added value conversion,
  - ✓ Environmental and climate protection, carbon capture and mitigation, carbon offset markets.

Reductive thermal processing of organic material by pyrolysis (agricultural, food industrial, urban, industrial waste, clean coal processing), biochar biotechnological (solid state fermentation) formulation and soil applications, carbon based **resource and nutrient added value recycling** from the agriculture and food industry (**especially phosphorous and nitrogen** from food grade animal bone meal and other sources), **soil science**.

Work field coverage: applied science and industrial engineering and agri/enviro commercial field applications. The three major – carbon related – work-fields:

- ✓ **Carbon Recycling and Refining**, thermal processing by zero emission carbonization for recycling of carbon for wide range of natural and carbon negative product applications, most importantly biochar.
- ✓ **Carbon Bio-formulation**, biotech formulation of biochar/carbon for efficient bio and plant availability of nutrient uptake process support.
- ✓ **Carbon Bio-energy**, chemical processing of carbon for synthetic transport liquid fuel (bio-jetfuel kerosene) bio-energy production.

**TERRA Humana Ltd has been established in 1989**, as Swedish-Hungarian joint venture between the Swedish environmental engineer Edward Someus and Lang Machine Works (**since 1868** as Central Europe's largest industrial boiler and carbon processing manufacturing organization (now Alstom Power). Terra Humana Ltd. has been independent SME organization since year 2001. The TERRA company **mission is to develop, engineering design and manufacture of novel bio-waste and biochar based technologies** and organic waste treatment systems on a EU level for advanced bio-char processing by pyrolysis and biotech means for the industry and agriculture.

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TERRA is the only one biochar vendor in Europe, with official and accredited Authority permit to use qualified and eco-safe biochar in open ecological soil environment (permit number 02.5/67/7/2009). During the past two decades the company put in huge human and financial efforts to develop innovative eco-industrial advanced solutions, design, implement and tests “product like” field plants to meet **SME specific market demands** in the EU 27, Australia and Japan.

Extensive scientific and SME industrial networks developed in 10 EU countries and in Australia with large number of RTD partners, Universities, large institutions, SME and large industrial organizations, especially in the NL, DE, UK, IT, ES, DK, AU. The SME company is having advanced and well equipped research, laboratory and field test facilities in W Hungary with **12 high qualified work force** and extensive SME cooperation on international level.

### Edward Someus:

**International leading scientific and industrial engineering expert in bio-waste and industrial scale biochar added value processing, valorization and reuse applications by pyrolysis and integrated biotech means** for Phosphorous and Nitrogen nutrient recycling, enhanced food crop quantity and quality production, restoration of soil natural balance and pyrolysis by-product zero emission recycling.

Senior Swedish environmental engineer (age 63). Education: University of Lund in Sweden 1972 - 1978, graduated in 1978, M.Sc., Natural and Environmental Sciences. Combining high level of scientific knowledge with industrial engineering and field applications, specializing in the: research, technical development, engineering, permitting, industrial applications and implementation of the zero emission carbon refinery, low temperature carbonisation and torrefaction technology, for recycling and reuse of carboniferous materials by integrated thermal/biotechnological means. **Specializing in the indirectly heated rotary kiln technique** and auxiliary installations, such as off gas treatment and biofuel refinery, and **soil biotechnology**. Inventor of the 3R **zero emission carbon refinery** pyrolysis technology and carbon applications for soil improvements, including pyrolysis syngas processing, biochar solid state fermentation and formulation for enhanced and safe food crop productions.

### **Previous 5 years major EU Commission references:**

1. **EU FP7 289785 REFERTIL – compost & biochar EU27 standardization and centralized law harmonization** (roll: coordinator and key technology scientific RTD & industrial designer, urban-agri-food industrial waste recycling targeting especially Phosphorous and Nitrogen recycling, definition of EU27 improved compost and biochar standards for EU legislation harmonization in 2014-2015, Reducing mineral fertilizers and chemicals use in agriculture by recycling treated organic waste as compost and bi-char products) 2011-2015.
2. **CIP Eco-innovation ECO/08/238984/ SI2.532247** (roll: coordinator and key technology scientific RTD and industrial designer, Phosphorous recycling) 2009-2012.
3. **EU FP7 211457 EUPHOROS** (partner, spent rockwool and nutrient recycling from horticultural industry) 2009-2012.
4. **EU FP6 PROTECTOR 514082** (roll: coordinator and key technology scientific RTD and industrial designer, Phosphorous recycling) 2005-2009.
5. **EU FP5 NNE5/363/2001** (roll: coordinator and key technology scientific RTD and industrial designer, Clean Coal processing design) 2002-2005.