



3R Environmental Technologies Ltd.

“Converting Trash Into Cash”

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ADVANCED CARBON BIOREFINERY

Economical **Recycling-Reuse-Reduce**
of agricultural and/or food industrial waste streams
for **Prevention-Protection-Preservation**

COMPANY PRESENTATION

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WHO WE ARE:

The **3R ENVIRONMENTAL TECHNOLOGY** group is an Swedish origin innovative technology development and industrial engineering organization for high tech carbon biorefinery for management of products & services for Eco-industry & Agriculture on the rapidly developing and growing E.U. & U.S. Markets.

CORE COMPETENCE:

COAL & CARBON: **Zero emission solutions:** advanced carbonization technology industrial engineering and design for industrial production of added value *Clean Coal energy & Agricultural Carbons.*

AGRO SOIL SCIENCE & AGRO BIOTECHNOLOGY = **carbon negative solutions.** Natural Phosphorous recycling technology for food grade hog animal bone meal by-products added value utilization. Advanced agro biotechnological solid state fermentation & formulation (SSFF) technology for production of *multifunctional and added value AGROCARBON products* for plant growth promotion and natural fertilizer application in organic and low input food crop production.

PYROLYSIS TECHNOLOGY



BLANK CARBON PRODUCTS



“SSFF” FERMENTATION TECHNOLOGY



AGROCARBON PRODUCTS



3R BUSINESS PRIME FOCUS:

COAL & CARBON: technical development, engineering and manufacturing of the patented **3R Thermal Desorption** (pyrolysis - thermolysis) **Low Temperature Carbonization** Technologies (special carbon manufacturing from renewable biomass, agro refuse and hard coal; regeneration of activated carbon, coal de-sulphurization for Clean Coal).

AGROCARBON: development of innovative environmental and agricultural technologies for (1) restoration of natural balance and functionality of degraded continental agro soils with controlled microbiological activity and (2) plant nutrient supply for sustainable, improved, economical and ecological food crop production.

3R TECHNOLOGY VALIDATION PROGRAM:

The organization is the owner of the fully permitted industrial sites in West Hungary. The **Biomass & Agricultural Biotechnological Innovative Technology Demonstration and Training “3R” Center** is well suited for innovative and advanced agricultural, environmental and industrial technology field demonstrations under different EU programmes, including - but not limited to - pyrolysis & carbonization technologies, biomass utilization and biological control of soil borne plant pathogen technologies as well. U.S. 5,707,592 patented.

3R DEMO CENTER





PRODUCTS & SERVICES for AGRICULTURE

3R CARBONIZATION TECHNOLOGY design and manufacturing: for hard coal and agricultural organic by-product carbonization processing, incl. animal bone meals.

INDUSTRIAL EQUIPMENT DESIGN AND MANUFACTURING: design, manufacturing, turn key installation and maintenance service of industrial equipment, such as directly and indirectly heated rotary kilns, heat exchangers, off-gas treatment systems, post burners, air selectors, etc.



3R Carbonization Plant

AGROCARBON: 3R for degraded soil natural balance restoration: The 3R technology providing added value valorization of food industrial and agricultural organic waste and byproduct streams by integrated carbonization and biotechnological means.

The input material is processed carboniferous agro materials and bone meal (having high Phosphorus and Calcium content), with origin of food industrial processing, and/or other biotechnological natural solid carriers.

The feed material is carbonized in a specific indirectly heated rotary kiln and than adapted by soil microbiological substances by product specific fermentation process. The output end product provides combined effect, **3 in 1 triple effect, providing natural soil balance restoration for degraded agro soils** and used in the **low input and organic farming agriculture, with special aim to the vegetable and medicinal herb plant cultivations:**



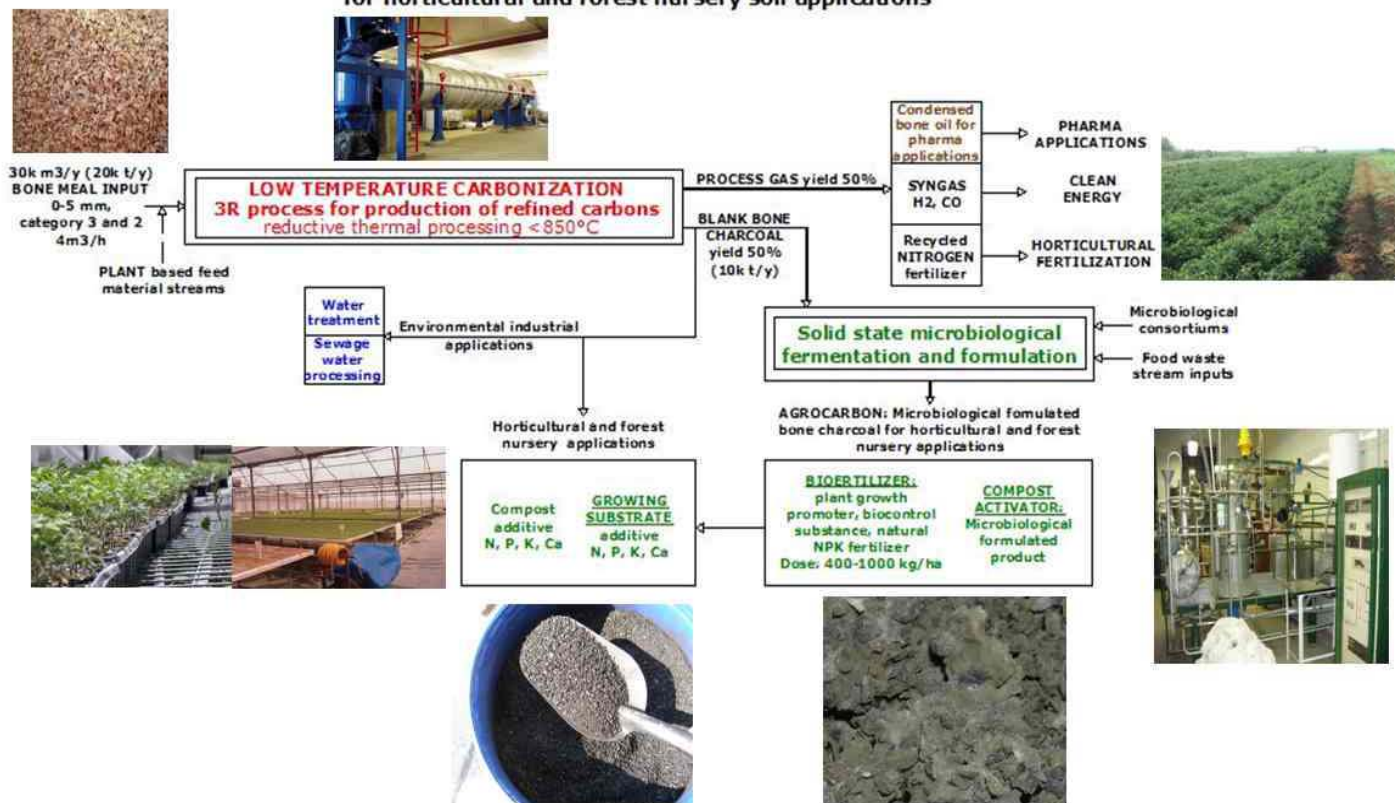
- **Biological control** effect against soil borne plant pathogens, for substitution or significantly lower the input of agro chemicals.
- **Plant growth promotion**, for natural substance support to get higher plant yields with better quality and safer food products.
- **Natural fertilization** for substitution of heavy metal contaminated rock phosphate fertilizers.



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3R AGROCARBON BIOREFINERY PROCESSING: Economical conversion of agri and food industrial waste streams into added value products for horticultural and forest nursery soil applications



The **INPUT FEED STREAMS** are low value (plant/animal based) organic and/or inorganic byproducts; such as high Phosphorous content animal bone meal, refuse grain, food processing and agricultural by-products; which can be valorization transformed/processed by added-value means.

The **OUTPUT PRODUCTS** are different types of soil biotechnology specific solid carrier composites and formulated microbiological fungus and/or bacteria strain consortiums. Depending on the different soil and climate application scenario conditions, different types of relevant AGROCARBON products can be made.

MULTIFUNCTIONAL AGROCARBON = Biodiverse ecological agriculture and agroforestry for increased food production and reduce the climate footprint of agriculture, as well as playing a major role in ecosystem restoration and maintenance.

The Multifunctional Agrocarbon products supporting the food chain market development for more consumption and higher value of healthy food crop production from low input and organic farming production scenarios.

AGROCARBON VALIDATION:

The detailed Authority permit test investigation has been going on in four years (2005-2009) by different independent and accredited departments from the HU national Soil and Plant Protection Authority under EU legislation. **Permit registration number: 02.5/67/7/2009.**



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Curriculum Vitae

Name: **SOMEUS, George Edward** Date of birth: April 28, 1951
Citizenship: Swedish Swedish Personal Id. No: 510428-2594

Soméus – combining high level of scientific knowledge with industrial engineering and field applications, specializing in the: research, technical development, engineering and industrial applications of the Thermal Desorption Technology for solid hazardous waste management, Low Temperature Carbonisation Technology for recycling of carboniferous materials and LLW radioactive sludge stabilization and volume reduction. Specializing in indirectly-directly heated rotary kiln technique and auxiliary installations, such as post combustion chamber constructions and off gas treatment scrubbers.

EDUCATION

Univ. of Lund in Sweden 1972 - 1979, graduated in 1978, M.Sc., Natural and Environmental Sciences.

EXPERIENCE

Geoteknik AB of Sweden (1979-1986): consulting and engineering for environmental protection and pollution control systems in South Sweden.

Product Control Ltd. of UK (1986-1997): technical manager of the Research, Technical Development and Engineering of innovative hazardous and nuclear waste treatment, pollution control technologies, manufacturing of Activated Carbon and Clean Coal.

1989-- Terra Humana Clean Technology Development, Engineering and Manufacturing Ltd. of Hungary: manufacturing of ceramic/activated carbon water treatment micro filtration equipment, EU RTD performer soil decontamination-recultivation, soil-ground water remediation project management, development of bio-impregnated activated carbon and surface modified zeolite for soil qty improvement. Coordinator and key technology designer for EU FP5 and FP6 application oriented RTD projects.

2008-- 3R Environmental Technologies Ltd. (Gibraltar): executive manager of the company, a holding company for innovative scientific developments and global marketing of the 3R technology for global markets. Project management for industrial applications of the "3R" technology.

Large projects (90's): Swedish Elektrolux Corp. chlorinated hazardous waste landfill design, construction and operation (project value USD 7,5 M). Hungarian Railway soil and ground water decontamination (project value USD 0,75 M). Ceramic-Activated Carbon filter manufacturing (USD 1,1 M). EU Clean Coal project NNE5/363/2001 (project value ECU 2,248,440). NATO soil remediation, ref no. 973720. Invention-Patent: Method and Apparatus for Treatment of Waste Materials, Including Nuclear Contaminated Materials (patented in the USA, 1998, No. 5,707,592). FP6 and FP6 RTD project coordinator and key technology designer. Contracted FP7 project partner, and large collaborative FP7 proposal coordinator and key technology designer.

SKILLS

Successful project management with result oriented leadership skills, team player with high work ethics and goals, strong analytical skill with problem solving ability.

Efficient manager of general contracts, including administration - finance - legal issues, and technical specialist in recycling and pollution control. Knowledge in EU and US industrial and environmental laws, regulations and permitting procedures, ISO 14000 auditor, efficiency in computer analyses.

High level skills in soil science, soil decontamination – recultivation – soil qty improvement.



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MAJOR EU PROJECT REFERENCE LIST

Past 5 years

2002-2005 - EU FP5: Coordinator and technology designing engineer for the 3R Multi Fuel Clean Coal FP5 project, with participation of Universities, research institutes and multinational companies from seven EU countries (NNE5/363/2001, project value €2,25M). The goal is to develop Clean Coal technology by preventive pretreatment of the coal, for clean energy production in solid fuel power generation <300 MWe capacity. DISSEMINATION: The project ended in 2005 and after engineered scale up design the innovative technology has been licensed and listed on the London Stock Exchange for world wide large scale investment and marketing.

2005-2009 - EU FP6: Coordinator, key technology designing engineer and strategic dissemination manager for the PROTECTOR EU FP6 N^o. 514082 project for the European Union with 12 partners from eight countries (project value €2.7 M). http://ec.europa.eu/research/agriculture/success_protector_en.htm

2008-2012 - EU FP7: RTD partner in the collaborative project “EUPHOROS - EFFICIENT USE OF INPUT IN PROTECTED HORTICULTURE”, project number 211457 (FP7-KBBE-2007-1), 2008-2012.

2010-2012- EU-CIP-ECOINNOVATION dissemination, marketing and market replication of the Agrocarbon technology and product. Project number: ECO/08/238984/SI2.532247.



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(General Director, Environmental engineer)

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