


CURRICULUM VITAE

→ Family name:	SOMEUS	
→ First name:	Edward	
→ Date of birth:	April 28, 1951	
→ Nationality:	Swedish	
→ Civil status:	Married	
→ Education:	M.Sc. (environmental and biochar S&T senior engineer)	

Education	Degree(s) or Diploma(s) obtained:
University of Lund, July 30, 1978	M.Sc. –Natural and Environmental sciences

- **Language skills:** Indicate competence on a scale of 1 to 5 (1 - excellent; 5 – basic)

Language	Reading	Speaking	Writing
Swedish	1	1	1
English	1	1	1
Hungarian	1	1	1

- Other skills: Computer literacy: Windows, MS-Office 2007, AutoCAD Mechanical
- Present position: Director of Terra Humana Ltd.
- Years within the firm: 25 (1989 - 2014)
- Key qualifications and experience:
 - ✓ **Environmental science**, zero emission organic waste processing by pyrolysis, biochar - bonechar, carbon management, soil science, environmental biotechnology and nutrient recycling from agricultural and food industrial waste and by-products. Core competence: Coal & Carbon, Phosphorous & Nitrogen, biochar:
 - Applied environmental scientific RTD in the fields of zero emission 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,
 - Phosphorous & Nitrogen recycling, including special core competence for animal bone char 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 industrial engineering**, with special concern to carbon green energetic and biochar / animal bone char environmental applications, incl. added value and zero emission pyrolysis and torrefaction processing of agricultural - food industrial – forestry and solid organic waste streams, Clean Coal. Inventor of the 3R pyrolysis and integrated solid state fermentation and formulation technology original solutions.

Development concept: ZERO EMISSION PYROLYSIS PROCESSING with high added value economical valorization of animal by-products, including food grade bone meal (category 3), low moisture content manure from herbivorous animals, such as poultry, sheep, rabbit, goat and horse, and category 1-2-3 processed animal protein. Development of storable high energy sources, such as kerosene – jet fuel type of liquid synthetic fuels from biomass pyrolysis oils and Clean Coal from mineral coals. 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.
- **Carbon Bio-formulation**, biotech formulation of 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-energy production.
- ✓ High level skills in **carbon cycles** in soil in temperate climatic zone, **soil fertilization, soil decontamination and re-cultivation**, biochar management. Healthy food comes from healthy soil.
- ✓ 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 with strong understanding of issues of relevance for international co-operation in the environmental sector, including strong experience in environmental project identification, coherent organization, management and evaluation.
- ✓ **Knowledge in EU and US industrial and environmental laws, policy, regulations and permitting procedures**, Accredited ISO 14000 auditor (LORIEN 97/11/916); Environmental Assessment Auditor for air quality, water protection, waste management, hazardous waste management, soil protection, ecology protection and noise protection; familiar with Climate Change guidelines,
- ✓ **High level skills in pyrolysis, COAL & CARBON energy and environmental aspects related sector** science & technology and its application, **including carbonization – pyrolysis process engineering**, CCS and CCT aspects, pyrolysis rotary kiln designs, off gas treatment and post burners from lab to industrial full scale. Have proven knowledge and experience of project management, project design, organization and implementation in the area from applied science to industrial scale up and economical implementation.
- ✓ **EU Coal programme evaluator, financial and technical evaluation.**
- ✓ International professional experience in the EU (DE, NL, IT, ES, UK, FR, A, FI, SE) and IL, USA, RU, UKR, IN. **Extensive previous experience with EU pyrolysis and biochar programmes/projects, technical - scientific - financial coordinator of EU FP programmes since 2001**, experience of project Cycle Management and the Logical Framework.

- ✓ Coordinator and key technology designer of large scale EU FP pyrolysis and biochar programmes: EU FP5 Clean Multi Fuel 2002-2005 (€2,3 M), EU FP6 PROTECTOR 2005-2008 (€2,7 M), EU CIP ECOINNOVATION 2007-2009 (€ 1.2 M), Intelligent Energy 2006-2007 (€200k), Bio-Agro Phosphorus 2007-2009 (€ 125k), FP7 REFERTIL 2011-2015 (€4.2 M). Financial and technical assessment.

Specific experience:

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.

Experience	Role
Pyrolysis and torrefaction zero emission processing of organic waste	Inventor, technology designer and execution officer
Contaminated soil remediation	Technology designer and execution officer
Biochar and soil biotech processing	Technology designer and execution officer
Catalytic conversion of pyrolysis oil to refined bio oil transport fuel	Inventor, technology designer and execution officer
Pyrolysis process control (OMRON based)	Technology designer and execution officer
Germany, Hungary, The Netherlands, Greece, Latvia, Italy, France, Spain, United Kingdom, Ireland, Denmark, Slovenia, Poland (Coordination and participation in different EU and HU national projects)	Since 1999 continuously

Professional Science & Technology references

Date from - Date to	Location	Company	Position	Description
2011-2015	EU27	Terra Humana Ltd.	Coordinator and key technology designing engineer and strategic dissemination manager	EUF7 REFERTIL 289785: Development of new compost and biochar standards in the EU27 for EU law harmonization. Improvement of comprehensive bio-waste transformation and nutrient recovery treatment processes for production of combined natural products. (project value €4.2 M)
2009-2012	Hungary, The Netherlands, France	Terra Humana Ltd. (EU CIP coordinator)	Coordinator and key technology designing engineer and strategic dissemination manager	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. (PROTECTOR), ECO/08/238984. Project evaluation, financial and technical. CIP-ECOINNOVATION-Pilot and market replication project. (project value €1.2 M)
2008-2012	The Netherlands, Spain, Italy, UK, Hungary	Terra Humana Ltd. (EU FP7 partner)	Environmental research performer and engineering	Reducing the need for external inputs in high value protected horticultural and ornamental crops. (EUPHOROS), Contract number: 211457 RTD partner in FP7 collaborative project
2008-2009	France, Hungary, Luxembourg	Terra Humana Ltd.	Market investigation performer	Promotion of Biomethanisation in Agricultural Environment as a Decentralised Renewable Energy Resource for Europe BIOPROFARM, Project number: EIE-05-086 Intelligent Energy Europe project. Project partner
February 15, 2007-end on 2009.	UK/USA	VERTUS/ NviroCleante ch Ltd.	Environ engineering consultation	Clean Coal processing engineering consultation, aiming to set up of an 4 t/h capacity Clean Coal demo plant in the US Cincinnati, based on a refurbished Alstrom calciner old rotary kiln. Results: only purposely designed technologies works well, advised not to go for refurbishment of an old Alstrom calciner, designed originally for other process.
2002-2005	German, Hungary, The Netherlands, Greece, Latvia	Terra Humana Ltd. RTD for EU FP5 NNE5/3636/2001- EU Commission DG Directorate General Energy and Transport	Coordinator and key technology designing engineer and strategic dissemination manager	Multi Fuel Operated Integrated Clean Energy Process: Thermal Desorption Recycle-reduce-reuse Technology" (MULTI FUEL) EU FP5 NNE5/3636/2001 FP5 project, with participation of Universities, research institutes and multinational companies from seven EU countries (NNE5/363/2001, project value €2,25M). The goal was to develop Clean Coal technology by preventive pre-treatment of the coal, for clean energy production in solid fuel power generation <300 MWe capacity. Project drafting, implementing and evaluation.
2005-2008	German, Hungary, The Netherlands, Italy, France, Israel, Spain, United Kingdom	Terra Humana Ltd. RTD for EU Commission DG Food Safety	Coordinator and key technology designing engineer and strategic dissemination manager	"Recycling and upgrading of bone meal for environmental friendly crop production and nutrition." (PROTECTOR), Food-CT-2005-514082 FP6 project for the European Union with 12 partners from eight countries (project value €2.7 M). Project implementing, technical-financial-legal evaluation.
1995-2005	India	Activated carbon manufacturing consultancy	Consultant	Sheikilla Glas of India industrial site diversification programme evaluation for installation of 2000 t/y capacity pyrolysis activated carbon plant in Calcutta, Carbon capture and storage. Project assesment,feasibility study.

March 10 1994 - March 25, 1994	Ukraina	Terra Humana Ltd.	Charcoal processing enviro engineering	Svaljava Zakarpattia Biochar processing pyrolysis factory (build 1895) reconstruction plan consultancy in line with new coal technologies and CCS aspects Project evalaution and fianncial estimation
June 2, 2008 – June 15, 2008	Ukraina	Terra Humana Ltd.	Charcoal processing environmen tal engineering	Svaljava Zakarpattia Charcoal processing factory (build 1895) pyrolysis and biochar reconstruction plan consultancy in line with new coal technologies and CCS aspects.Project evalaution and estimation
March 25 1994 - March 28, 1994	Russia	Terra Humana Ltd.	Activated carbon processing consultancy	Consultancy for pyrolysis and activated carbon applications from planned Svaljava Zakarpattia Charcoal processing factory reconctructed site in line with new coal technologies and CCS aspects.Project evalaution and fianncial estimation
April 5, 2010 - April 8, 2010	Russia	Terra Humana Ltd.	Russian steel quality consultancy	Development of cooperation for Russian manufacturing of special alloy made environmental equipments
2000-2005	USA	University of Maryland, Mechanical Engineering	Trans Atlantic scientific cooperation programme developer	Thermal Desorption Technology Development, Engineering and Manufacturing: Thermal desorption technology marketing in the USA for Clean Coal energetic applications for solid fuel power plants <250 MWe.
May 1, 1986 February 1, 1997	UK	Product Control Ltd. of UK Comco Martech Ltd. HU	Director- Environmental Engineer	Manufacturing of Activated Carbon and Clean Coal: 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, CCT and CCS technologies.
June 15, 1989- ongoing	Hungary	TERRA HUMANA Clean Technology Development , Engineering and Manufacturin g Ltd., Hungary	Environmen tal engineer- Coal and Carbon Technology Developme nt, Engineering and Manufacturi ng	General manager of the Research, Technical Development and Engineering of innovative carbon processing treatment, pollution control technologies, manufacturing Clean Coal and carbon bio refinery. Technical, financial and legal project evaluation. Coal and Carbon Technology Development, Engineering and Manufacturing: <ul style="list-style-type: none"> • low temperature carbonization technology development and design • off gas control technology development and design • coal desulphurization technology development and design, Clean Coal processing • agricultural by product carbonization and carbon soil applications • solid state fermentation and formulation • bio-oil processing to transportation fuel
April 10, 2007 – Decembe r 15, 2009	Hungary	Terra Humana Ltd.	Environmen tal engineering	Bio-Agro Phosphorus 2007-2009 (€ 125k). High temperature carbonization process development of animal bone meal waste for recycling of natural Phosphorous mineral. Project assessment, technical-financial and legal evaluation.
January 15, 1995 - February 1, 1997	Hungary	Comco Martech Ltd. for Swedish Elektrolux Corp	Environmen tal engineering	Chlorinated haz waste landfill design, construction and operation (project value USD 7,5 M). Environmental remediation of LEHEL refrigiator factory site in East Hungary Jaszbereny, after privatization take over by Electrolux.
August 1, 1995 - March 15, 1997	Hungary	Comco Martech Ltd. for Hungarian Railway	Environmen tal engineering	Hungarian Railway soil and ground water decontamination (project value USD 0,75 M). Environmental remediation of East Hungarian wood preservation factory Puspokladany and costruction of protective soil barrier.

March 1, 1995 - February 15, 1998	Hungary	Comco Martech Ltd.	Environmental engineering	MSW Municipal Solid Waste recycling 2007-2009 (€ 2 M), Selection and combined thermal/biological treatment of MSW for production of alternative added value outputs.
March 15, 2001 – March 15, 2003	Hungary	Terra Humana Ltd.	Environmental engineering	NATO soil remediation, ref no. 973720. Development of new cyclodextrin technique for accelerated remediation of high PAH content soil contamination at former military sites, with demonstration at South Hungarian Dunaujvaros military base.
March 1, 1979 April 15, 1986	Sweden	Geoteknik AB, Sweden Helsingborgs Plattsättning AB	Environmental Engineer	Consulting and engineering for <ul style="list-style-type: none"> • industrial environmental remediation • chemical and food industrial sites • environmental protection and pollution control systems in South Sweden, • management of field solutions Environmental assessment studies, waste treatment studies, construction works for Helsingborg coal fired electric power generation plant, MSW landfill constructions and RTD of Low Temperature Carbonisation – Clean Coal and Activated Carbon manufacturing - technology applications, design and operation of paper waste transportation system in South Sweden

Other relevant information Conferences, seminars, publications:

• **3R 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.

Carbon Bio-formulation, biotech formulation of 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-energy production.

• **3R TECHNOLOGY MAIN ELEMENTS:**

CARBONIFEROUS MATERIALS-to-REFINED CARBONS: carbonization process (main technology), indirectly heated horizontally arranged rotary kiln vacuum pyrolysis.

CARBON BIO-CARRIERS: solid state fermentation and formulation, biotech process, where specific and biotech adaptable carbon is used as solid carrier for soil microorganism for purpose of accelerated and plant available mineral dissolution, develop controlled microbiological environment in soils with effects of plant growth promotion and biocontrol by effects. Objective: safer food production for less cost.

CARBON-to-LIQUID FUEL (biomass-to-liquid fuel): catalytic conversion of raw pyrolysis gases/oil liquids to high grade liquid bio-fuels.

3R APPLICATIONS:

Agro: plant and/or food grade animal bone (category 3) based biomass carbon biorefinery conversion, biochar, bone char; fully natural NPK-C fertilization of food crop productions with biocontrol and plant growth promotion effects, and strong support of drought and salt tolerance food crop/forest cultivations.

Energy Biomass: plant and/or animal MBM/PAP organic waste to solid (bio-carbon) and liquid (steam reformed producer gas, bone oil (Dippel's Oil), bio oil, thermal energy.

Energy Clean Coal: conversion and valorisation of brown coal into clean coal and transport fuel kerosene. Conversion and valorisation of scrap tire rubber crumb into liquid fuel and secondary carbon black.

Adsorbent: bone char adsorbents for very high efficient treatment of macromolecular organic contaminations, heavy metal and radionuclide contaminations.

Other applications are for cases by case considerations.

Publications:

European Union CORDIS database: **EU FP5 NN5/363/2001 MULTI FUEL** “*Multi Fuel Operated Integrated Clean Energy Process: Thermal Desorption Recycle-Reduce-Reuse Technology*” 2002-2005 (coordinator and key technology designer) <http://cordis.europa.eu/>

European Union CORDIS database: **Food-2005-514082 PROTECTOR** “*Recycling and upgrading of bone meal for environmentally friendly crop protection and nutrition*” 2005-2008 (coordinator and key technology designer) <http://cordis.europa.eu/>

Someus, “**3R biotechnology integrated industrialized biochar production**” **2008 Conference of the International Biochar Initiative,** BIOCHAR, SUSTAINABILITY AND SECURITY IN A CHANGING CLIMATE, **Newcastle, United Kingdom**, September 8-10, 2008, www.biochar-international.org

J Postma, E Nijhuis, F Clematis, E Someus, “**Recycling and upgrading of bone meal for environmentally friendly crop protection and phosphate fertilization**” ORBIT Conference, October 13-15, 2008, Moving Organic Waste Recycling Towards Resource Management and for the Biobased Economy, Wageningen, The Netherlands. Wageningen University Research, Plant Research International B.V, P.O. Building nr. 107, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands <http://www.orbit2008.de>

C Baum, P Leinweber, K Eckhardt, E Someus, M Halasz, “**Auswirkungen der Applikation von mit *Trichoderma harzianum* inokulierter Knochenkohle auf die mikrobielle Biomasse, Enzymaktivitäten und die Zusammensetzung der organischen Substanz des Bodens** (*Effects of the application of animal bone charcoal inoculated with *Trichoderma harzianum* on the soil microbial biomass, enzyme activities and the composition of soil organic matter*), German Community of Soil Science Conference in Osnabrueck, February 25, 2008,

J. Postma, E. Nijhuis, F. Clematis, E. Someus “*A new carrier for biocontrol agents*”, Wageningen University Research, Plant Research International B.V, P.O. Building nr. 107, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands.

J. Kruse, P. Leinweber, F. Godlinski, E. Someus, “*Speciation and quantification of inorganic and organic P forms in environmental samples by P L-edge XANES*” University of Rostock, Germany, Agriculture & Agrifood Canada, Lethbridge Research Station.

E. Someus, “*TOWARDS ZERO EMISSION: Economical Conversion of Low-grade Coal to Clean Coal by Low Temperature Carbonization Pretreatment Process*” Twenty-seventh Annual International Conference on Thermal Treatment Technologies; May 12-16, 2008, Montreal, Quebec, Canada, Air & Waste Management Association, USA, University of Maryland, USA, United States Department of Energy. www.awma.org/.

M Polgari, J Hein, M Toth, A Brukner-Wein, T Vigh, E Someus, M Halasz, L Biro, “*Genesis of a regionally extensive celadonitic chert/ironstone bed overlying Upper Lias Manganese deposits*” (SED-2007-OM-176), Sedimentology, International Association of Sedimentologists.

E Someus, “**Plant derived feed additive: recent scientific results and regulatory development, successful EU projects and partners for scientific cooperation**” FEED – SEG Symposium, January 14-15, 2008, Hungary, <http://www.matchmaking.at/feedseg/>

E Someus, “*Moving Towards Zero-Emission Plants*” June 20-22, 2005, Leptokarya Pieria Greece

International Symposium, <http://www.lignite.gr>, <http://www.lignite.gr/mt0ep/mt0ep.htm>

E Someus, “**The 3R Anthracite Clean Coal Technology**” CARBO 2/2006, Poland

E Someus, “*THE 3R ANTHRACITE CLEAN COAL TECHNOLOGY. Economical Conversion of Browncoal to Anthracite Type Clean Coal by Low Temperature Carbonization Pre-Treatment Process*” Original scientific paper, UDC: 662.641.66:662.612, BIBLIO: 0354-9836, 10 (2006), 3, 55-69. THERMAL SCIENCE:Vol. 10. (2006) No.3, pp.55-69.

E. Someus, *Food crop mineral deficiency and disturbance stress mitigation in temperate climatic regions by economical and environmental valorization of agricultural by-products*, Nova Science, New York, 2009. Web:
https://www.novapublishers.com/catalog/product_info.php?products_id=8372

G. P. Warren, J. S. Robinson and E. Someus, *Dissolution of phosphorus from animal bone char in 12 soils*, Nutrient Cycling in Agroecosystems, Volume 84, Number 2/ Jun, 2009, Springer Netherlands. <http://www.springerlink.com/content/4876u47123372264/>

J. Postma, E.H. Nijhuis, E. Someus, **Selection of phosphorus solubilizing bacteria with biocontrol potential for growth in phosphorus rich animal bone charcoal**, Applied Soil Ecology 46 (2010) 464–469, August 2010, www.elsevier.com/locate/apsoil.

J. Postma, F. Clematis, E. H. Nijhuis, E. Someus, **Efficacy of four phosphate-mobilizing bacteria applied with an animal bone charcoal formulation in controlling Pythium aphanidermatum and Fusarium oxysporum f.sp. radicum lycopersici in tomato**, Elsevier, Biological Control 67 (2013) 284–291, 19 July 2013, www.elsevier.com/locate/ybcon

Terra Humana Ltd. (TERRA)

Established 1989 as SE-HU joint venture (HU10254073)
Laboratory: 8154 Polgardi, Gyula Manor, Hungary pyrolysis RTD and demo center
web: www.agrocarbon.com
email: biochar@3ragrocarbon.com

EU PIC Code: 999693447

General manager, owner and key tech designer: Edward Someus (Swedish environmental engineer)

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.

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, USA and Asia. Extensive scientific and SME industrial networks developed in 10 EU countries and in the USA with large number RTD partners, Universities, large institutions, SME and large industrial organizations, especially in the NL, DE, UK, IT, ES. 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.

FAQs

WHAT IS 3R?

The 3R Recycle-Reuse-Reduce is a zero emission carbonization (pyrolysis, reductive treatment) processing system operating at relatively low temperature, up to 850 degree Celsius. The main module is an indirectly heated horizontally arranged rotary kiln original solution.

• **What is 3R biochar or agrocarbon?**

The 3R BIOCHAR or AGROCARBON is **plant and/or animal biomass origin carboniferous material for carbon negative soil enhancement eco-safe applications**. The biochar effects are natural slow release fertilization, food crop plant growth promotion, improving soil retention of nutrients and water, while decreasing and/or substituting the use of chemo-synthetic substances in agriculture

WHICH TYPES OF FEED MATERIALS ARE PROCESSED BY THE 3R?

- ✓ **Category 3 and 2 bone meal (all types), prime feed material**
 - Category 3 and 2 MBM meat and bone meal / PAP processed animal protein (all types),
- ✓ Dry manure (all types),
- ✓ Plant based waste materials (<20% moisture content),
- ✓ MSW derived organic fraction (<30% moisture content),
- ✓ Brown coal, including extraction of humic/fluvic acid for agri applications,
- ✓ Organic waste materials.

HOW THE 3R OUTPUT PRODUCTS ARE IMPROVING THE FOOD SAFETY?

The 3R ABC Animal Bone bioChar (apatite mineral based, with >30% P₂O₅) - made from food grade bones - is a pure natural and fully safe product, aiming restoration of soil natural balance. The 3R bone char does not containing Cadmium or Uranium contamination, such as P rock fertilizers does, and does not containing any chemosynthetic substances or potentially toxic chemicals.

WHAT IS THE MARKET INSIGHT OF THE AGROCARBON AS TO WHAT THE DEMAND IS, WHO BUYS IT?

There is a wide and rapidly expanding green market for the 3R products in large international dimension, for which the main uses including, but not limited:

- **Horticultural farming soil cultivation productions in low input and organic farming sectors**, with clear objective to minimize chemosynthetic substances from the safe food chain production base. Supplier of natural NPK-C.
- **Horticultural and forest nursery. Soil and soilless cultivations.**
- **Compost makers for production of enriched compost.**
- **Adsorption industry and water treatment.**
- Agricultural and environmental biotech industry, solid state fermentation and formulation.
- Green energy production, transport biofuel and green electric power.