



TERRA HUMANA Clean Technology Engineering Ltd.

Thermal Desorption Technology Group

Your partner for bridge over applied environmental science to industry
General Manager: G. Edward Soméus

Company Information

The **TERRA HUMANA** Clean Technology Engineering Ltd. **Recycle - Reduce - Reuse "3R"** is a integrated Swedish – Hungarian – American industrial and business organisation for professional management of products & services for industry & agriculture on the rapidly developing U.S. & E.U. markets.

Recognising the demands for the global technology change of year 2000 - required to meet the new strict U.S. and E.U. Environmental & Industrial Standards & Norms, and advanced technical, market, cost & energy efficiency requirements - the 3R has created an integrated Trans-Atlantic scientific, industrial and business group. Uniting and using decades of experiences of our senior team, we are able to meet the new global market needs with our high tech products & services.

The U.S. 5,707,592 patented 3R product and service program are integrated and linked to the industry and agriculture. The prime focuses on the 3R business are:

ADVANCED TECHNICAL & BUSINESS ENGINEERING

Technical development, engineering and manufacturing of the U.S. patented 3R **Thermal Desorption** (thermolysis) waste management (soil treatment, hazardous waste management, Waste-to-Clean Energy, LLW radioactive sludge treatment) and Low Temperature **Carbonization Technologies** (Activated Carbon manufacturing from agro refuse and hard coal, Clean Coal de-sulphurization of lignite, Secondary Carbon Black and Liquid Fuel recycling from scrap tire).

Management of North American & European Union Integrated Business Programs for environmental, industrial and agricultural projects. Participation in and/or promotion of industrial and agricultural projects and business programs with technical assistance. Promotion of international business, and management company representations and services.

PRODUCTS & SERVICES for INDUSTRY & AGRICULTURE
Converting Trash Into Cash by 3R Applications

3R Carbonisation Equipment Design and Manufacturing: for production of high quality powdered, broken and granular Activated Carbon filtration material from agricultural by-products, animal bones and hard coal, including carbon impregnation. **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.

Eco Agricultural Programs: design and engineering of integrated thermal desorption and biological soil remediation and soil recultivation systems. RTD of biopesticide and natural soil fertility improvement for sustainable organic farming production. Development of products and technologies to combat soil degradation and diffuse obsolete pesticide contamination in soil.

3R Clean Coal: preventive pre-treatment cleansing & homogenisation of high Sulphur, Mercury and Chlorine content lignite/coal for Clean Fuel / Clean Energy power-generation up to 300 MW electric power capacity.

Water and Air Filter Manufacturing: manufacturing and assemblage of ceramic-activated carbon-zeolite micro filters (Edward's Aqua Humana).

3R PRODUCT QUALITY CONCEPTS

Meet the comprehensive and strict new U.S. Standards and E.U. Norms under integrated control of ISO 9001, NATO AQAP 110 and ISO 14001.

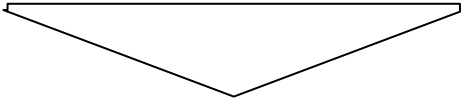
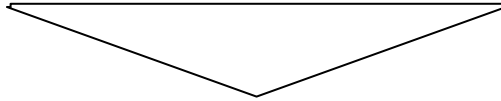

3R Pilot Plant for Low Temperature Carbonisation Technology



For and on behalf of 3R
G. Edward Soméus (General Manager)

3R

Thermal Desorption Technology

| A. | B. |
|---|--|
| <p style="text-align: center;">  <u>Thermal Desorption</u> Applications </p> | <p style="text-align: center;">  <u>Low Temp. Carbonization</u> Applications </p> |
| <p style="text-align: center;"> <u>Solid Hazardous Waste Treatment</u> throughput capacities: 6,000 m³/year to 36,000 m³year </p> | <p style="text-align: center;">  <u>Activated Carbon</u> output capacities: from 750 t/year </p> |
| <p style="text-align: center;"> <u>Soil Decontamination & Recultivation</u> throughput capacities: from 3,000 m³year </p> | <p style="text-align: center;"> <u>Clean Coal Lignite/Coal Desulfurization</u> throughput capacities: 45,000 t/year to 750k t/year </p> |
| <p style="text-align: center;"> <u>LLW Radioactive Contaminated Sludge Stabilisation</u> throughput capacity: 100 l/h </p> | <p style="text-align: center;"> <u>Secondary Carbon Black & Liquid Fuel</u> Recycling from Tyre Crumb throughput capacities: 3,500 t/year to 20,000 t/year </p> |

3R Process Characteristics

Indirectly heated -patented- rotary kiln

Reductive thermal treatment

Process under vacuum

Up to 600 degree Celsius material core treatment temperature

Post combustor with 850 degree Celsius or 1,250 degree Celsius treatment temperature and minimum 2 sec. residence - real - time

Closed and continuous input - output

Complete solution

It is a SAFER, BETTER, FASTER, LESS COSTLY process than any other known treatment solutions

3R Process Advantages

SAFE, advanced and intelligent technology

MEETS ALL U.S. - E.U. STANDARDS, the design is prepared to meet future U.S. and E.U. technical requirements, industrial and environmental norms in a sustainable way

ECONOMICAL, cost & energy efficient

COMPREHENSIVE SOLUTION, no need for (expensive) post processing of residues


LINKAGE, integration and upgrade opportunity to existing traditional industrial installations, modular design

DECENTRALIZED installation opportunity to target small and medium sized projects

3R Sustainable Waste Management Products & Services for Industry & Agriculture

Emission Prognosis

(273 K, 101,3 kPa, 11 % O₂)

| |  Units | IPR 5/3 U.K. 1996 EU Dir. 89/369/EEC | Proposed E.U. | 17. BImSchV Germany | 3R Max. Values |
|------------------------------------|--|---|-------------------|------------------------|-------------------|
| Dust | mg/Nm ³ | 30 | 10 | 10 | 2 |
| THC (VOC) | mg/Nm ³ | 20 | 10 | 10 | 1 |
| HCl | mg/Nm ³ | 30 | 10 | 10 | 1 |
| HF | mg/Nm ³ | 2 | 1 | 1 | 0,1 |
| SO _x as SO ₂ | mg/Nm ³ | 300 | 50 | 50 | 5 |
| NO _x as NO ₂ | mg/Nm ³ | 350 | 200 | 100 | 100 |
| CO | mg/Nm ³ | 100 | 50 | 50 | 50 |
| Hg, Cd | mg/Nm ³ | 0.1 | 0.05 | 0,05 | 0.01 |
| As, Cr, Cu, Pb, Ni, | mg/Nm ³ | 1,0 | 0.5 | 0,05 | 0.001 |
| PCDD/PCDF, Limit | ng/Nm ³ | 1,0 | 0.1 | 0,1 | 0.001 |
| Target | ng/Nm ³ | 0.1 | non detectable | non detectable | non detectable |

G. Edward Soméus

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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, specialising 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 stabilisation and volume reduction. Specialising 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.

1999-- Thermal Desorption Technology Group LLC. of North America: executive manager of the company, a Swedish – North American holding company for innovative scientific developments and global marketing of the 3R technology for US and export markets, based on US made equipments and services. Project management for industrial applications of the "3R" technology.

Large projects (90's): Swedish Elektrolux Corp. chlorinated haz 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).

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.
- Thermal engineering of hazardous and LLW radioactive waste.
- High level of technical writing and interpersonal skills in English, Swedish and Hungarian.

REFERENCES

Prof. Dr. A.K. Gupta: University of Maryland, Mech. Engineering USA Tel.: (1-301) 405 5276
 Dr. T. Feuk: United European Environment Controls Ltd. U.K. Tel.: (44-1428) 661 470
 Prof. Dr. L. Jakab: Budapest Technical University, Hungary, Tel.: (36-20) 943 9107

Major Reference List of Edward Soméus

University of Lund, Sweden, 1972-1979, Environmental and Natural Science, environmental assessment and geological survey works for Vattenfall AB electric power generation company.

Geoteknik AB, Sweden, 1979-1986, 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, Höganäs AB Sweden: 1982-1986, construction works for improvement of industrial environment in chemical industries. 1980 - 1986, design and operation of waste transportation system in South Sweden.

Product Control Ltd., U.K., 1987 - 1996, RTD and Engineering of Low Temperature Carbonisation and Thermal Desorption Technology applications.

Terra Humana Clean Technology Development, Engineering and Manufacturing Ltd., established in 1989 as a Swedish – Hungarian joint venture company with large equipment manufacturer for design, manufacturing and installation of waste treatment equipment.

* Low Temperature Carbonization and Activated Carbon technology engineering, manufacturing and operation of Field Demonstration Plant in Hungary, (1989 – 1994)

Pacific Basin Consortium for Hazardous Waste Research and Management, USA, Hawaii, Honolulu, April 20 -24, 1998: Advanced Thermal Desorption of Solid Hazardous Waste.

U.S. Environmental Protection Agency, VISITT 5.0 1996, where 3R is highlighted under the (1)Thermal Desorption, (2)Pyrolysis and (3)Off-gas Treatment.

U.S. EPA's Fifth Forum on Innovative Hazardous Waste Treatment Technologies: Domestic and International, Chicago, Illinois, May 3-5, 1994.

ADPA, American Defence Preparedness Association, Environmental Restoration Opportunities Conference, Munich, Germany, October 25-27, 1994.

Comco Martech AG., Switzerland, 1996 - 1998: chief engineer for environmental works in Hungary, whereas executing general contract based remediation works, such as for Hungarian Railway, MOL Hungarian Oil Company, Lehel Elektrolux. General contracted works:

* Hungarian Railway Wood Preservation Works East Hungary: writing a tender including technology specification and detailed cost calculations, upon tender award writing a detailed juridical contract for the work, organization and integration of the work, financial management and administration of the work: complex soil and Activated Carbon ground water remediation technology design, site assessment, construction and execution of works. Project value: USD 600,000.-.

* Hungarian Railway Wood Preservation Works West Hungary: writing a tender including technology specification and detailed cost calculations, upon tender award writing a detailed juridical contract for the work, organization and integration of the work, financial management and administration of the work: complex Activated Carbon ground water remediation technology design, site assessment, construction and execution of works. Project value: USD 425,000.-.

* LEHEL ELEKTROLUX: recovery of illegally dumped 80,000 m³ hazardous waste, chlorinated hazardous waste landfill design, construction and management of landfills, technical supervision and start up the leach water treatment operational phase after finalization of the construction, financial and administrative supervision. Project value: USD 7,5 million.

Sensor - Batalas, UK-Hungary: ISO 14000 lead auditor workshop, no.: 97/11/916

* ISO 14001 auditing the Hungarian Railway Real Estate Service

* ISO 9001, NATO AQAP 110 auditing works and services

ZENON Systems Ltd. Canada, 1999: water treatment project management/marketing works.

Environment-orientated Sustainable Industrial Development in Central Europe During the European Union Integration Process: Expert Meeting and Workshop as a Preparatory Forum of Specific Project Development, Thursday 21st January 1999 Budapest, Hungary

Title: "Environment and Sustainable Development: Creation of New Industrial Employment by Global Market Distribution of Advanced Waste Recycling and Treatment Technologies"

Executive field manager of NATO project for soil remediation: NATO ref number 973720.

Coordinator and technology designing engineer for 3R Multi Fuel Clean Coal project for the European Union, with participation of Universities, research institutes and multinational companies from seven EU countries (NNE5/363/2001, project value ECU 2,248,440). The goal is to develop Clean Coal technology by preventive pretreatment of the coal, for clean energy production in solid fuel power generation between 50 MW and 300 MW capacities.

From 1997 - United European Environment Controls Ltd. UK, partner and consultant for company for waste management projects in the UK and India.

From 1999 - Manager and owner of the **Thermal Desorption Technology Group LLC.** of North America, a holding company for U.S. operations applying 3R technologies and services.

From 1989 - **TERRA HUMANA Clean Technology Development, Engineering and Manufacturing Ltd.** of Hungary, soil decontamination, ground water remediation, recycling of refuse agricultural materials and biomass utilization engineering company.

Exclusive Hungarian distribution partner for Fairey Industrial Ceramics of UK. manufacturing of ceramic/activated carbon drinking water treatment equipment for hospitals, military field application and house hold use. Producer of "Edward's Aqua Humana" ceramic/activated carbon micro filters.

Scientific co-operations in 2001-2002

(in alphabetic order)

GERMANY

Institute of Energy and Environmental Technology, University of Rostock
GSF-Forschungszentrum für Umwelt und Gesundheit GmbH (GSF Research Centre for Env. and Health)
Federal Agricultural Research Centre (FAL), Institute of Technology and Biosystems Engineering,

GREECE

Aristotle University of Thessaloniki, (AUTH)
Centre for Solid Fuels Technology and Applications (CSFTA)
Institute of Molecular Biology & Biotechnology (FORTH-IMBB)
Technical University of Crete Laboratory of Environmental Engineering and Management (TUC) Chania

HUNGARY

Bay Zoltan Foundation for Applied Research, Institute of Biotechnology (Baybio - Szeged)
Budapest University of Technology and Economics (BUTE), Inst. of General and Analytical Chemistry
CEREOL Group Research & Development Centre for Vegetable Oils
University of Debrecen, Medical and Health Center, Faculty of Medicine, Department of Human Genetics
"Frédéric Joliot-Curie" National Research Institute for Radiobiology and Radiohygiene

ITALY

Adriatica Ecologie Industriali s.r.l.
Comune di Colferro (Roma)
Istituto "Mario Negri", Milan

LATVIA

Latvian State Institute of Wood Chemistry, LSIWC
University of Latvia, Research Institute of Microbiology and Biotechnology

NETHERLANDS

ECN Netherlands Energy Research Foundation
TNO-MEP

POLAND

Research Institute of Pomology and Floriculture

PORTUGAL

Soldadura e Qualidade (ISQ)

ROMANIA

INCD – ECOIND, National Research –Development Institute for Industrial Ecology
Regional Club for Ecological Rehabilitation and Sustainable Development – Oltenia

SPAIN

CSIC Spanish Council for Scientific Research
IRNAS Instituto de Recursos Naturales y Agrobiologia de Sevilla
CEBAS Dpt. Soil and Water Conservation Campus Universitario de Espinardo, Murcia

U.K.

Brimac Carbon Services Ltd.
MCS Ltd.
Sutcliffe Speakman Carbone Ltd. - Waterlink
United European Environment Controls Ltd (UNECO)

USA

University of Maryland