

California Organics Recycling Council
and BioCycle

Anaerobic Digestion Workshop

April 12, 2010

San Diego, CA

BioCycle West Coast Conference

Vendor Background Information



BIOFerm

(EXHIBITOR)

Presenter - Nadeem Afghan

Founded in the year 2001, BIOFerm GmbH is an energetic, rapidly growing company in the field of design, construction and operation of biogas plants. With its innovative, patented dry-fermentation process, biomass – i.e. any sort of organic, non-wood waste, whether from households, agriculture or other areas – can be turned into clean, environmentally friendly energy. Skyrocketing prices for agricultural commodities, especially corn and grains, nearly choked the biogas boom in 2007. BIOFerm's systems, however, do not depend on expensive agricultural commodities – they can use any form of organic waste, including that from landscaping and municipalities' waste management.

In the few years since its incorporation, BIOFerm has become the technological leader in its industry and in CO₂-neutral energy generation. In 2007, due to the outstanding potential of BIOFerm's technology, the company became part of the Viessmann International Holding Group. BIOFerm has close partnerships with, amongst others, MAN, Siemens AG, REHAU AG & Co., TÜV Süd, Atzwanger AG, Bozen, enabling the company to provide clients with a comprehensive range of services, from biomass management to heat conduction systems. BIOFerm now delivers comprehensive systems for integrated waste management, composting and energy generation.



CCI Bio Energy

Presenter - Kevin Matthews

CCI BioEnergy Inc. (CCI) is a privately held company. CCI's business proposition is to capture organic waste before landfilling, and employing this waste fraction as a renewable resource for profitably producing clean energy and compost in an environmentally beneficial manner. CCI offers the services of design / build, owns, sells, and operates in any combination, BioEnergy plants for processing the organic fraction of Municipal Solid Waste (MSW), and or industrial wastes. CCI is also interested to find credible license partners within North America. This proposition calls for an alternative approach to the traditional landfilling practice for the enormous organic segment of the global MSW industry. CCI offers a foundation of proven experience, a pragmatic waste strategy, exclusive licensing of leading and proven technology, and solutions delivery.



enbasys biotech energy

(EXHIBITOR)

Presenter - Klaus Ruhmer

®enbasys is based in Austria, Europe and has developed a new technology for biogas production. The innovative ENBAFERM High Load Hybrid Reactor system is three times more efficient than traditional biogas systems. Besides the fermenter itself, ®enbasys also supplies all required components for successful Anaerobic Digestion systems such as substrate management (treatment), waste water treatment and biogas conversion.

®enbasys delivers turn-key plants including plant design, engineering, plant supply and construction. Plants are designed in close collaboration with our customers. The focus is on excellent process stability and long-term reliability so that continuous biogas production is guaranteed.

Via its partner companies VTU Engineering and BDI-BioDiesel, ®enbasys is now offering its technology and services globally.



Envirco™

*"Rethink . Recycle . Reuse . Restore . Renew
Sustainable environments for our future."*

Envirco

Presenter - Jennifer Mitchell

*Envirco is not a composter or anaerobic digestion processor. Envirco has a cost effective technology that can solve the organic solid waste disposal problems (from food sources, agricultural production, landscape trimmings and livestock manure) without impacting ground water sources and without harmful or toxic air emissions. The process, Enhanced Autogenous Thermophilic Aerobic Digestion (EATAD) is patented, and proprietary and uses thermophilic (heat responsive) microbes to process organic waste over a 45 to 72 hour period with zero harmful environmental discharge. **It is completely self-contained with the end-product of clean water and a fertilizer - No gases or VOCs in the air, - No odors, - No leachate into the soils or water table. The end product is a very stable organic fertilizer that promotes increased agriculture production.** The technology is operational around the world for over ten (10) years and is truly, zero waste for a sustainable environment.*



Harvest

(EXHIBITOR)

Presenter - Kate Wattson

Through innovative technologies and unparalleled industry experience, Harvest provides the next generation of organics recycling. We develop, build, own and operate state-of-the-art facilities that produce renewable energy and compost from discarded organic materials. We deploy best-in-class technologies for composting, biogas production, and biomass gasification. We provide the capital for our projects and top-tier talent to finance, engineer, construct and operate the facilities. Our purpose is to help businesses, governments, and individuals thrive sustainably by creating a new path for organics that harvests valuable resources.

Orbit Energy, Inc

Presenter - Jim Bailey



Orbit Energy, Inc. owns a proprietary renewable energy technology that converts a wide variety of solid organic wastes into biogas and compost/organic fertilizer. The technology referred to as High Solids Anaerobic Digestion (HSAD), was originally developed at the U.S. Department of Energy's National Renewable Energy Laboratory during the 1990's. Orbit's business model is to build, own and operate its HSAD plants. Orbit Energy currently has offices in Raleigh, North Carolina, an HSAD facility in Clinton, North Carolina, and is planning to begin construction on 4 additional plants in North Carolina and California.

HSAD can process organic wastes with up to 45% solids.

Some examples include food waste, yard waste, food processing wastes, animal wastes, and the organic fraction of municipal solid waste. These organic wastes are best suited for our HSAD technology and can be processed without any waste streams, including waste water.

For further information please contact Jim Bailey (919) 882-3906 jbailey@orbitenergyinc.com or visit our website orbitenergyinc.com

ORGANIC ENERGY CORPORATION

Organic Energy Corporation

Presenter - Larry T. Buckle

Organic Energy has a proprietary process that separates black bin waste into three streams, wet organics, dry organics, and inorganic materials. This is accomplished without utilization of manual sorting.

The wet organic stream is converted to methane and a rich soil amendment utilizing the Induced Blanket Reactor (IBR) Digester. The IBR creates a vibrant bacteriological environment producing a stable digestate. The continuous process accepts high solids, requires no mechanical mixing, needs about 15 minutes of operator attention per day, and has a hydraulic retention time (HRT) of less than 5 days. The IBR provides an optimum balance of capital cost, operational cost and simplicity, with a very small footprint.

For more information please contact Larry Buckle, P.E. at (916) 549-0868 or at Buckle@IES-ENG.COM



Organic Waste Systems

Organic Waste Systems

Presenter - Luc de Baere

Organic Waste Systems (OWS), Inc. is a world leader in the construction and operation of anaerobic digestion plants for solid and semi-solid organic waste streams. Established in 1988, OWS invented the dry anaerobic digestion process called "DRANCO" for full and partial stream digestion of municipal household, industrial, commercial and institutional organic wastes. Since that time, OWS has enjoyed steady growth in revenues, plants constructed, and financial stability. There are now there are eight demonstration-scale facilities and 19 large sites in operation across Europe and Asia, with four more scheduled to come on line by the end of 2011. Additionally, OWS also provides oversight and managerial assistance to an additional 22 plants worldwide, including wet digestion. DRANCO is a one-step process with higher biogas productivity and kill off of pathogens and weed seeds in the feedstocks. OWS's patented SORDISEP process provides additional options for economical separation of non-digestible wastes to ensure high quality compost. OWS's accredited laboratory enables optimal process design, recipe development and plant operation.



Real Energy, LLC

Presenter - Kevin Best

RealEnergy was founded in 2000 by real estate and energy professionals, and has developed, built, owned and operated more clean onsite power plants than any independent power producer in North America. These systems run up to 24 hours per day providing safe and reliable power. Natural gas engines, turbines and solar photovoltaic's are located close to the user to capture waste heat for heating and cooling resulting in lower cost, 'cleaner than grid' power. In 2004, the fleet was sold to ArcLight/John Hancock, followed by a management buyout in 2005.

RealEnergy, LLC is laser focused on developing a portfolio of renewable gas plants serving the gas and electric grid and CNG vehicles using organic waste and energy crops in North America. Two \$14m projects have completed the pre development phase and are shovel-ready for the development phase. Over 20 sites have been selected for pre development.



RosRoca

Presenter - Dr. Dieter Jürgen Korz

ROS ROCA envirotec is an international company providing worldwide engineering, procurement, construction and commissioning solutions for waste and biomass treatment plants. Numerous waste treatment plants designed by ROS ROCA are successfully operated throughout Europe, handling a variety of organic waste streams, with different capacities.

ROS ROCA envirotec has built more than 20 anaerobic digestion plants using its own technology which treat around 950,000 tons of waste per year. Furthermore Ros Roca offers biogas upgrading plants that produce bio methane with natural gas quality. It can be injected directly in natural gas grid or used as bio fuels. CNG and LNG technologies supplement Ros Roca's technologies. Moreover, Ros Roca has also built 29 composting plants throughout Europe (tunnels, drums and corridors) with a total capacity of around 1,400,000 tones per year of waste treated.

*As a global solution, Ros Roca envirotec offers the MBT that integrate several processes commonly found in other waste management technologies such as **mechanical sorting, anaerobic digestion (AD), biogas utilization and composting plants**. A ROS ROCA MBT plant can incorporate a number of different modular processes in a variety of combinations adapted to the amount and quality of the plant input.*



renewable energy producers

Yield Energy Inc.

Presenter - Rolfe Philip

(EXHIBITOR)

YIELD Energy Inc. ("YIELD") was formed in December of 2006 for the purpose of developing, constructing and operating renewable energy facilities in North America based on the anaerobic digestion of urban/suburban organic feedstocks. YIELD was incorporated in Ontario and has offices in Toronto and Seattle.

Through a proven, state-of-the-art two stage pre-processing and anaerobic digestion technology, YIELD's system can convert physically contaminated feed stocks from both residential (e.g. yard & garden, food waste) & commercial (e.g. packaged & physically contaminated food waste: grocery stores, restaurants, cafeterias) into renewable electricity and bio-methane for grid or low carbon fuel use.

YIELD and its partner Fitec currently have 5 commercial facilities operating in Europe, processing a total of 55,000 tonnes of municipal and commercial food waste and generating 2.5 MW of renewable energy. In addition, there will be 2 new facilities commissioned this summer in the UK and Luxembourg.



Zero Waste Energy

Presenter - Eric Herbert

Zero Waste Energy (ZWE) combines commodity recovery and energy production through unique waste-to-energy processing systems, utilizing a variety of patented technologies to capture and recycle waste streams with an emphasis on transforming the organic fraction into electricity or compressed natural gas through a dry anaerobic digestion process.

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**CLIMATE
ACTION
RESERVE**

Climate Action Reserve

Presenter - Max DuBuisson

The Climate Action Reserve is a national offsets program working to ensure integrity, transparency and financial value in the U.S. carbon market. It does this by establishing regulatory-quality standards for the development, quantification and verification of greenhouse gas (GHG) emissions reduction projects in North America; issuing carbon offset credits known as Climate Reserve Tonnes (CRT) generated from such projects; and tracking the transaction of credits over time in a transparent, publicly-accessible system. Adherence to the Reserve's high standards ensures that emissions reductions associated with projects are real, permanent and additional, thereby instilling confidence in the environmental benefit, credibility and efficiency of the U.S. carbon market.

Current management practices for organic waste are a large source of uncontrolled methane emissions in the United States. Methane is a very potent greenhouse gas. The Climate Action Reserve has adopted a protocol for crediting emissions reductions from the diversion of organic waste for anaerobic digestion. Projects that divert MSW food waste from landfills, or certain agro-industrial wastewaters from uncontrolled anaerobic storage, into an anaerobic digester can receive credit for the avoided methane emissions. The methane generated by the digester must be captured and destroyed. The Reserve is also in the process of developing a protocol for issuing offset credits for composting projects, due out in June of 2010.