



EBW 2008 Program Schedule

- Program as of October 9, 2008 -

Tuesday, October 14, 2008

10:00am-08:00pm Registration Open (Foyer of Exhibit Hall A)

05:00pm-08:00pm **Welcome Reception, Exhibits Open**

Welcome Note:

Dr. Ines Freesen, Managing Director, Freesen & Partner GmbH / EBW Organizer

Keynote Speakers:

- The Impact of Climate Change on Agriculture
Dr. Jerry Hatfield, Director, USDA National Soil Tilth Laboratory
- The Future of Biomass Energy in America
Robert Wallace, Associate Director, Biomass Energy Center / Director, The BioEnergy Bridge

Closing Remarks:

Dan Griffiths, Acting Deputy Secretary, Office of Energy and Technology Development, PA DEP

Ribbon Cutting Ceremony

Reception with Complimentary Food Buffet and Cash Bar in Exhibit Hall A

Wednesday, October 15, 2008

07:30am-09:00am Exhibitor Breakfast (at the Westin Hotel, for exhibitors and sponsors only)

08:00am-05:00pm Registration Open (Foyer of Exhibit Hall A)

09:00am-05:00pm **Exhibits Open**, Exhibit Hall A

10:00am-12:00noon Conference Session A1:

Market & Project Update: United States and International

Session Chair: **Robert Wallace**, Associate Director, Biomass Energy Center / Director, The BioEnergy Bridge

Funding Opportunities for Alternative and Clean Energy Projects in Pennsylvania

John Nikoloff, Partner, The Pennsylvania Energy Resources Group, LLC (ERG)

Tractors Without Tankers

Glen Cauffmann, Manager of Farm Services, Penn State University

Advanced Anaerobic Digestion at the Hermitage Municipal Authority – Implementation for Class A Biosolids and Food Waste Augmentation

Jason Wert, Senior Project Manager, Herbert, Rowland & Grubic, Inc.

Energy Generation from Tire-derived Fuel in Erie, PA

Dr. Vic Gatto, Principal and COO, Caletta Renewable Energy, LLC

Biomass Fired Combined Heat and Power Plants (CHP) with Organic Rankine Cycle (ORC) in Europe

Hartmut Kiehne, CEO, Adoratec GmbH

Discussion

10:00am-12:00noon Conference Session B1:

Finance & Investment Forum

Session Chair: **Nathaniel Doyno**, Steel City Biofuels/PSU

Speakers: **Des O'Connor**, Innovative Works; **Dan Griffiths**, PA Dept. of Environmental Protection; **Brian Kennedy**, Pittsburgh Technology Council; **Joel Morrison**, West Penn Power Sustainable Energy Fund

12:00noon-02:00pm Lunch Break in Exhibit Hall

02:00pm-04:00pm Conference Session A2:

Conversion Technologies: Anaerobic Digestion, Refuse-Derived Fuels, Waste-to-Power

Session Chair: **Dr. Sardar Q. Hassan**, Senior Program Analyst, U.S. Department of Defense

Energy Production from Waste Using the Anaerobic Membrane Bioreactor Process

Ian C. Page, Senior Process Engineer, ADI Systems Inc.; **Masashi Moro**, Kubota Corporation

Organic Recycling for Distributed Energy Generation using High Solids Anaerobic Digestion

Brian Duff, Director of Technical Studies and Process Engineering, BBI International

An Economic and Environmentally Sustainable Technology for the Utilisation of all Calorific Waste – Case Study of a 120,000 t/a Capacity Waste Gasification Plant

Daniel Drechsler, Technical Director, Bellwether Gasification Technologies Ltd.

Case Study on Cement Kiln Conversion to Alternate Fuels

Christoph Lange, Vice President Sales & Service, IKN Inc. USA

Power from Poultry Litter

Terry Walmsley, Vice President of Environmental and Public Affairs, Fibrowatt

Discussion

02:00pm-04:00pm Conference Session B2:

Project Development Forum

Moderator: **Nathaniel Doyno**, Steel City Biofuels/PSU

Speakers: **Wilfred Muskens**, PA Dept. of Community and Economic Development; **Frank Horrigan**, Governor's Action Team; **Ed Johnstonbaugh**, Penn State University; **Dewitt Peart**, Pittsburgh Regional Alliance; **Bob Hurley**, Allegheny County Economic Development (tbc)

Thursday, October 16, 2008

07:30am-09:00am Exhibitor Breakfast (at the Westin Hotel, for exhibitors and sponsors only)

08:00am-12:00noon Registration Open (Foyer of Exhibit Hall A)

09:00am-05:00pm **Exhibits Open**, Exhibit Hall A

10:00am-12:00noon Conference Session A3:

Fuel Production: Sustainability, Production Efficiency, Quality Assurance

Session Chair: **Tracy Wingenroth**, Partner, The Pennsylvania Energy Resources Group, LLC (ERG)

The Price of Fuel: What makes Biomass Sustainable?

Scott Miller, Marketing Consultant, Price BIOstock

The Crawford County Camelina Project: A no-till system approach for the production of biodiesel

Joel M. Hunter, Northwest Dairy Team, Penn State Extension

Improving Production through Testing

Dr. Joseph N. Garner, President & Chief Operating Officer, APE-BridgePath Scientific

Options for Cleaning Biodiesel Fuel

Jonathan Dugan, Product Specialist, Schroeder Biofuels

Discussion

10:00am-12:00noon Conference Session B3:

Workforce Development Forum

Moderator: **Jan Lauer**, Three Rivers Clean Energy

Speakers: **Will Bernstein**, Allegheny Conference on Community Development; **Andrew Butcher**, GTECH Strategies; **Frank Sorg**, Penn State University; **Tim Aldinger**, Three Rivers Workforce Investment Board; **Rich Overmoyer**, GSP Consulting

12:00noon-02:00pm Lunch Break in Exhibit Hall

02:00pm-04:00pm Conference Session A4:

Plant Operating Experience: Optimal Plant Design, Lessons Learnt

Session Chair: **Robert Wallace**, Associate Director, Biomass Energy Center / Director, The BioEnergy Bridge

Intelligent Automation Systems – European-American Concepts for Higher Energy Efficiency
Jürgen Morawa, Division Head, Thermal Process Engineering, INP Deutschland GmbH

Residual Biomass and Waste for Energy Supply – Sewage Slurry Gasification and Fuel Cells in Sewage Treatment Plants / Unused Native Biomass of Brasil for Cogeneration Heat and Power (CHP) in Europe
Gerhard Huppmann, MTU Onsite Energy GmbH

Conversion of MSW, Tires and Biomass to Syngas through Plasma Gasification
Tom Gdaniec, Vice President, Sales, Alter NRG Gasification Solutions

"Gasification" of Carbonaceous Waste - The Bucks County Waste to Power Project
Richard Pearson, President & CEO, Mon Valley Power

Discussion

02:00pm-04:00pm Conference Session B4:

Youth Forum: Energy from Biomass and Waste 101 / Career Forum

Moderator: **Nathaniel Doyno**, Steel City Biofuels/PSU

05:00pm End of EBW 2008 Expo and Conference

Program Details

Oct 15, 10:00am-12:00noon Conference Session A1

Funding Opportunities for Alternative and Clean Energy Projects in Pennsylvania

John Nikoloff, Partner, The Pennsylvania Energy Resources Group, LLC (ERG)

Many independent and private energy projects flounder simply because the principals of the company are unaware of, or fail to access the full range of local, state and federal assistance programs. This presentation will outline possibilities for state assistance that have resulted from passage of Pennsylvania's new Energy Security Act, as well as other state and federal funding programs available in the arena of energy from biomass and waste. The speaker will also discuss the realities of using these state and federal programs, and the steps necessary to both qualify for and succeed in accessing these funds. Energy Resources Group's partners have been successfully providing services in these areas since 2002.

Tractors Without Tankers

Glen Cauffmann, Manager of Farm Services, Penn State University

After four years of biodiesel research collaboration with Penn State, New Holland became the first major company to endorse the use of 100% biodiesel. Penn State and New Holland are now testing other biofuels in tractors that will enable farmers to become self sufficient in fuel, and create greater economic security for the food industry by becoming less dependent on foreign oil.

Advanced Anaerobic Digestion at the Hermitage Municipal Authority - Implementation for Class A Biosolids and Food Waste Augmentation

Jason Wert, Senior Project Manager, Herbert, Rowland & Grubic, Inc.

This presentation will review the Hermitage Municipal Authority's upcoming Advanced Anaerobic Digestion Project that expands the existing wastewater treatment facility to 7.7 MGD and includes the construction of a Temperature-Phased Anaerobic Digestion for production of a Class A Biosolids. The facility will also implement a commercial and industrial food waste receiving program to enhance biogas production and stabilize electrical costs for the facility.

Energy Generation from Tire-derived Fuel in Erie, PA

Dr. Vic Gatto, Principal and COO, Caletta Renewable Energy, LLC

Erie Renewable Energy, LLC ("ERE") is developing a tire-derived-fuel to renewable energy plant on 65 acres of a former International Paper site under option agreement with the Greater Erie Industrial Development Corporation. In doing so, ERE has focused on developing a plan which offers numerous short-term and long-term benefits to the Erie area. ERE will prepare the site and design and construct a facility to generate renewable electrical power from processing fuel derived from tires and sell that power to the local electric grid. This plan will include the construction of a building to house the processing units that will generate 90 MW of net electrical power from 900 tons of derived fuel.

Biomass Fired Combined Heat and Power Plants (CHP) with Organic Ranking Cycle (ORC) in Europe

Hartmut Kiehne, CEO, Adoratec GmbH

A range of different plant technologies exist for generating electricity from solid biomass. Some of these technologies are fully developed for the market and have proved themselves in practice, others are still undergoing development or only exist as ideas or rough concepts. Their marketability must first be proved. One of the technologies, that has proved its suitability in practical operation for years, is ORC technology. Around 100 ORC power plants with capacities ranging between 200 and 2,000 kW (per module) have already been operating in central Europe since 1998, most of which are used in biomass power plants. Around 15 new plants were commissioned in 2007 alone; an even greater number are expected in 2008 and the growth rate is set to increase further in the next few years. At the moment, ORC plants are operated mainly in Italy, Austria, Switzerland and Germany. However, other markets are also expressing interest. The sharp increase in oil and gas prices has led power station operators to look for alternatives and serious consideration is being given here to ORC technology.

ADORATEC ORC-Technology: Adoratec ORC-Modules are designed for many different applications. High sophisticated design features in the ORC-system are offering high efficiencies, i.e. more electricity production but low fuel consumption. The most important ORC advantages: High efficiency even with small scale power plants; Low investment costs; Low demand on repair and maintenance - low operating costs; Easy to install and automatic operation.

Oct 15, 02:00pm-04:00om Conference Session A2

Energy Production from Waste Using the Anaerobic Membrane Bioreactor Process

Ian C. Page, Senior Process Engineer, ADI Systems Inc.; Masashi Moro, Kubota Corporation

Due to the extreme pressures imposed by a large population, limited land space and limited natural resources, Japan has often been a leader in the development of new technologies for waste management and energy production. In the late 1990s, Kubota Corporation introduced a unique form of anaerobic digestion technology that is now finding widespread application for the development of renewable energy from waste, the anaerobic membrane bioreactor, or AnMBR. This technology has also shown a great deal of promise for applications in North America, especially for the management and production of energy from food processing and biofuels production wastes. Kubota Corporation presently has twelve full-scale AnMBR installations operating or under construction in Japan, producing renewable energy in the form of bio-methane or biogas from a variety of feedstocks. Waste sources include alcohol production stillage, municipal garbage, septage, wastewater treatment plant sludge, and a variety of food processing residues and wastes. The first full-scale installation of the AnMBR process by Kubota was completed in 2000 (for septage and garbage), and the first full-scale AnMBR system in the USA was constructed in 2008 for treatment of a salad dressing and BBQ sauce production wastewater. The Kubota AnMBR process incorporates anaerobic digestion and membrane filtration in one process and is considered to be cutting-edge technology in the field of anaerobic digestion. This paper will review the technology, present case studies of its application, and discuss its potential role in the development of renewable sources of energy from waste in North America.

Organic Recycling for Distributed Energy Generation using High Solids Anaerobic Digestion

Brian Duff, Director of Technical Studies and Process Engineering, BBI International

Organic Recycling is emerging as a key strategy for solid waste management and sustainable development; it is an important and environmentally sound alternative to current waste disposal practices that can be integrated into existing municipal solid waste and energy management programs. Organic Recycling refers to the practice of recycling the carbon content of solid and wet organic wastes into value-added products, including compost, fertilizer and renewable energy. There are valuable environmental and energy benefits associated with distributed energy generation that can be achieved with Organic Recycling. The presentation reviews the basic science behind carbon recycling and the current state of the art in Organic Recycling, including communities where it is being implemented and the principal technologies that are emerging to meet the need. The presentation then focuses on the use of High Solids Anaerobic Digestion (HSAD) as a preferred method for recycling organics and generating distributed renewable energy. Potential feedstocks available to communities are described, as are the specific benefits to communities and businesses. A description of what an Organic Recycling facility consists of and looks like will be presented along with generic municipal and corporate case studies. The case studies are intended to give attendees an idea of the magnitude, cost and energy-generating potential of an Organic Recycling program, should they be interested in pursuing Organic Recycling using HSAD for Distributed Energy Generation.

An Economic and Environmentally Sustainable Technology for the Utilisation of all Calorific Waste – Case Study of a 120,000 t/a Capacity Waste Gasification Plant

Daniel Drechsler, Technical Director, Bellwether Gasification Technologies Ltd.

Climate change, sky-rocketing energy and raw material prices, signifies that the world is faced with a serious challenge. More than 1 billion MT of waste is produced in the world per year. In 2006, the US alone produced about 251 million tonnes of waste. In Europe, a total of 300 Million MT of waste per year is neither recycled nor thermally utilized. In other words, 300 Million MT of coal could be substituted with the use of these resources, representing about 9 million MT per year CO₂ savings. Bellwether Gasification Technologies Ltd. an innovative technology company in Germany has developed a proprietary and patented gasification technology - The IMG (Integrated *Multifuel Gasification*). This revolutionary ground breaking technology processes all calorific waste streams to produce a clean synthesis gas that can be used for energy production. The IMG is a multi stage gasification and gas treatment and conditioning process. The resulting gas is a clean synthesis gas with high efficiency, and emissions below standards. IMG technology ensures the complete treatment of all gaseous toxic substances and the inertization of residues. Our concept encloses the utilisation of all regional waste generated in the region of Basov in Romania. Metals, paper and value added plastic are sorted out and marketed. The rest waste is processed and energetically used in gas engines and boilers. About 98% of the waste is utilized, reducing pressure on landfills. Waste utilization via the IMG technology, is economically best fitted, and compared to all other known technologies available on the market.

Case Study on Cement Kiln Conversion to Alternate Fuels

Christoph Lange, Vice President Sales & Service, IKN Inc. USA

The case of the Ladce Cement Factory in the Slovak Republic illustrates the use of waste as alternate fuels AF in cement kiln lines. The factory has installed equipment developed by PSP Engineering in the Czech Republic. The objective of the cooperation between Ladce and PSP was the replacement of conventional fuels by maximum rates of AF such as tires, biomass, wood, animal residue, sludge, RDF, plastic, paper, textile, and solid waste for obvious economic reason. Acceptable degrees of preparation and homogenization of AF had to be considered. PSP applied Computer Fluid Dynamics CFD as a powerful tool for the development of the new equipment. A number of cheap and fairly quick calculations was made with the goal of obtaining optimum geometry and optimum technical conditions such as temperatures, pressures, residence time, and oxygen concentration during combustion. For a cement factory

it is important to maintain functionality of the equipment and stability of the process. By burning AF just like fuel this goal is achieved. CFD software provided views of good accuracy of problematic zones and of promising corrections.

CFD was used to determine

- types of AF acceptable in cement kiln lines
- maximum acceptable rates of AF
- maximum acceptable rate of AF with installation of a chlorine bypass
- minimal emissions
- expected results in Ladce.

For the CFD calculations the specific data about calorific heat, moisture, and particle size were either obtained from suppliers or the data were analyzed from samples. Finally, the longer lasting operating results are presented.

Oct 16, 10:00am-12:00noon Conference Session A3

The Price of Fuel: What makes Biomass Sustainable?

Scott Miller, Marketing Consultat, Price BIOstock

What is a "sustainable" feedstock? Blogger and marketing consultant Scott Miller focuses on the environmental, economic, and cultural factors that make a biomass feedstock sustainable in one region while not sustainable in another. He then organizes urban and rural feedstock "building blocks" into a "pyramid" hierarchy useful to developers and policymakers interested in establishing sustainable enterprises that are acceptable to local stakeholders. He will provide case studies that include the Range Fuels woody biomass biorefinery in Georgia, the Zero Waste initiative in Northern California, and the R.E.N.E.W / L.A. waste diversion project in Los Angeles.

The Crawford County Camelina Project: A no-till system approach for the production of biodiesel

Joel M. Hunter, Northwest Dairy Team, Penn State Extension

Camelina has advantageous characteristics for inclusion in our rotations in the development of sustainable no-till cropping systems. It is an early planted annual broadleaf in the brassica with a life cycle similar to spring oats: short seasoned and adapted to an early and cool. Camelina is easily direct-seeded (no-till drilled or broadcast) in late winter or very early spring very successfully. Seeding rates, inputs, and costs are very low. The camelina produces 1000 to 2000 pounds of seed per acre that is 35 to 40% high quality oil compared to 18-20% oil from soybeans. This is a potential of one to two barrels of biodiesel production per acre. The remaining high protein meal will hopefully soon be approved as a locally produced feed for livestock. The crop has demonstrated allelopathy (weed seed inhibition) and offers the benefits of potentially breaking cycles of weeds, disease, and insect pests. The mid-season harvest will offer us the opportunity to establish a cover crop and/or another cash crop for the remaining growing season. This promising low-input oilseed crop offers an affordable option for the no-till systems approach to cropping diversification and intensification that will be necessary to produce the needed food, feed, fiber, and fuel in a sustainable fashion as the demands on our lands continue to escalate.

Improving Production through Testing

Dr. Joseph N. Garner, President & Chief Operating Officer, APE-BridgePath Scientific

In today's emerging biofuels market, everyone is looking for a competitive advantage. One, often underutilized, resource is your testing facility. A good testing facility can provide you with more than just "pass/fail" results. They should be able to provide you with information about how tests are performed, the inherent bias within those test, and what results mean to you in real world terms. Your testing facility should also be able to provide you your results in a time frame that does not hinder your production or cause you to store fuel for a long period of time. Therefore, it is very important to pick your testing facility carefully. There are a number of criteria, other than price, that you should use to determine whether a testing facility can provide you with results that are accurate, meaningful, and reliable. The proper use of your testing facility can allow you to speed up production and should offer you insight into production optimization which can save you money.

Options for Cleaning Biodiesel Fuel

Jonathan Dugan, Product Specialist, Schroeder Biofuels

There are basically two ways to clean biodiesel fluid, namely wet wash and dry wash methods. This paper will address several alternatives for the dry wash method and discuss the various advantages and disadvantages of the different methods. This paper will also address the byproducts of the various cleaning processes and alternative methods of disposal of each. Also covered will be a discussion of ways to effectively determine fluid cleanliness following the cleaning process. One of the newest schemes for scrubbing biodiesel centers around the use of a cellulose based, natural and sustainable composition of adsorbent technologies suitable for any biodiesel, regardless of the source of feedstock.

Oct 16, 02:00pm-04:00pm Conference Session A4

Intelligent Automation Systems – European-American Concepts for Higher Energy Efficiency

Jürgen Morawa, Division Head, Thermal Process Engineering, INP Deutschland GmbH

It is obvious that optimization of energy systems contributes to higher efficiency, less pollution of environment and reduced operation costs. With combination of process engineering, technology of automation and innovative control systems we will succeed in more reliable and safe technologies for processes in power plants, incineration plants, steam production and power generation. INP is offering not only its knowledge in automation and control but also in expert systems for complex processes using fuzzy control as an intelligent tool for high-level operation of your plants in operation or in design phase. INP International Projects is a group of companies with a global presence, working in the fields of process controls engineering, power and automation technology, and thermal process engineering. The core services are consulting, engineering, U.S. services, as well as commissioning for international projects. INP is one of the European market leaders in the area of innovative combustion power controls. Our sales & service team supports European companies in technical sales, engineering, installation, commissioning and maintenance in North America. INP employs 250 people, with a total of five locations in Germany, Switzerland, Austria, the USA, and South Africa. Content of the presentation: reliability of processes; safe and simplified operation; higher grade of automation; cost reduction; reduced emissions of hazardous components; higher efficiency in power generation. US-Link: Integration of Western-European Technology into US-systems; Support of US-solutions of European operations; Adaptation of European standards and norms to US applications; Servicing of equipment with European technology; Maintenance concepts; Multilingual and multicultural personnel; Trends in Europe.

Residual Biomass and Waste for Energy Supply – Sewage Slurry Gasification and Fuel Cells in Swage Treatment Plants / Unused Native Biomass of Brasil for Cogeneration Heat and Power (CHP) in Europe

Gerhard Huppmann, MTU Onsite Energy GmbH

- Sustainable concept for integration of sewage slurry gasification and fuel cells in sewage treatment and energy supply systems:

The Problem and its solution: Conventional utilization and deposition of sewage slurry from municipal and industrial sewage treatment plants produce highly increasing costs. A solution is seen in an energetic utilization of the slurry and its simultaneous conversion into a more easy to be handled material. The concept combines and integrates two fundamental technologies into the system „sewage treatment plant“, the allothermal sewage slurry gasification and the utilization of the resulting synthesis gas together with the available biogas from the fermentation step in a fuel cell system MTU-HotModule and possibly in gas engines in the framework of a CHP application. The resulting electrical energy minimizes external supply or can be fed to the grid. Resulting heat will be used within the sewage treatment plant (heating fermentation step, drying slurry, etc.) or can be fed to steam or heat distribution systems. Excess biogas can be fed in form of biomethane into the natural gas grid downstream a gas treatment system (PSA for removing CO₂ from the biogas).

- Sustainable concept for utilization of presently unused native Brazilian biomass for CHP in Europe via fuel cells: The problem and a possible solution: In the last decade many power plants for municipal and industrial CHP were installed in Europe fed by palm oil or other biogene oils (present palm oil consumption in Europe approx. 860.000 tons per year). The price for palm oil is rapidly increasing (factor 3 within 3 years). Utilization of palm oil is highly competing food production and leads to destructive deforestation of rain wood forests followed by big amounts of CO₂ emissions. Additional requirements for power plants cannot be based on palm oil utilization in future. A solution could be: To use till now unused, native (already existing) biomass available in Brazil: Babassu, Macauba, Jatropha nuts. All these nuts are not competing food production. Babassu and Macauba are natively available; Jatropha is not native. These nuts can be used completely via gasification and subsequently in fuel cells for CHP with an extremely high electrical efficiency of more than 40 % and an overall efficiency of more than 90%.

The concept combines and integrates the same fundamental technologies and components as described above, but into the system "decentralized municipal and industrial energy supply and CHP"

Conversion of MSW, Tires and Biomass to Syngas through Plasma Gasification

Tom Gdaniec, Vice President, Sales, Alter NRG Gasification Solutions

Each year the United States and Canada generate close to 320 million tonnes in combined waste. The majority of the waste ends up in landfills where it engulfs acres of valuable land and emits greenhouse gases. Apart from landfills, around 10% of waste is thermally treated by processes which typically produce fly ash and bottom ash, requiring further treatment and landfill disposal. Alternatively, plasma gasification represents a clean and efficient option to manage waste in an environmentally responsible manner. In the plasma gasification process, heat nearly as hot as the sun's surface is used to break down the molecular structure of any carbon-containing materials – such as municipal solid waste (MSW), tires and biomass – and convert them into synthesis gas (syngas) that can be used to generate power or other sustainable sources of energy. Commercial applications of plasma gasification have been in operation in Japan since 2002. The Eco-Valley plant in Utashinai, Japan transforms up to 280 tonnes per day of MSW and auto shredder residue into steam and electricity. Emissions from plasma gasification facilities will be below the most stringent regulatory requirements in North America. No bottom ash or fly ash is generated. As well, metals and non-combustible inorganics are melted and captured in an environmentally benign slag, which can be used as construction aggregate. *Our paper will explain how plasma gasification works, benefits of plasma gasification over*

conventional waste management, commercial applications of plasma gasification in Japan and India and industry trends which are heightening interest for plasma gasification.

"Gasification" of Carbonaceous Waste - The Bucks County Waste to Power Project
Richard Pearson, President & CEO, Mon Valley Power

This project will "gasify" MSW and other carbonaceous waste streams to produce clean gas which is immediately combusted to produce large quantities of heat that drives heat recovery boilers to produce steam which drives steam turbines to produce electricity. Mon Valley Power, LLC (MVP) was established to design, develop and operate sustainable waste-to-energy (WTE) systems. Our business strategy entails the production and distribution of energy commodities derived by gasifying municipal solid waste (MSW) blended with other waste streams including commercial, industrial, and agricultural waste. Our WTE approach dramatically increases the domestic supply of resources available to produce clean and sustainable alternative energy commodities. In addition, our process alleviates a number of persistent environmental concerns associated with the disposal of domestic, commercial and agricultural waste. MVP's unique business model generates significant profits from multiple revenue streams, while providing clean, sustainable, reliable, affordable and secure energy to its clients. MVP is able to achieve its objectives by operating integrated systems designed to capture the resource value and embodied energy in otherwise wasted resources. The company's competitive advantage is its ability to derive optimal value from wasted resources using "appropriate technology".