

ENERGY PRODUCTS OF IDAHO

EPI NEWSLETTER

EPI NEWSLETTER FALL - 2010

WHAT'S NEW AT ENERGY PRODUCTS

Ameresco is the largest independently owned energy solutions provider in North America who's core business is providing energy generation and energy system optimization. Ameresco chose Energy Products of Idaho to supply two 120,000lb/hr biomass fluidized bed combustion/boiler systems for the Savannah River Site in Aiken, SC. These systems provide high pressure steam for power generation and low pressure steam for site heating and utilities. Fuel for the systems comes from local forest residue, used pallets and **Tire Derived Fuel** from the local landfill.

EPI's systems replace existing coal fired boilers and have a positive impact on emissions while dramatically reducing annual site operating costs. EPI is proud to be the energy system supplier for the Savannah River Project.

EPI erection advisors are working closely with site contractors. Erection began in June 2010.



Construction began this past summer. Start-up and commissioning should commence in the summer of 2011.

SPECIAL POINTS OF INTEREST:

- *Savannah Energy Savings*
- *Projects in Italy*
- *Gasification/Syngas*

INSIDE THIS EDITION

| | |
|-----------------------|---|
| SICILY, ITALY | 2 |
| EPI - ZACHRY | 2 |
| PILOT PLANT UPGRADES. | 3 |

EPI entered the market place as a fluid bed O.E.M. for the wood industry in the 1970's

Biomass may be partially combusted in the gasifier unit to form a combustible syngas which may be cleaned and used in an internal combustion engine.

NEW PROJECTS

Sicily, Italy

Energy Products of Idaho has been selected to provide a renewable fuel energy system in Sicily, Italy. The system is designed to convert eucalyptus tree wastes into steam for an 18 MWe renewable energy application. The contract is the sixth renewable energy project for EPI in Italy. The contract includes an EPI fluidized bed boiler system that delivers steam to a steam turbine/generator for renewable energy production.

In this application, EPI's proprietary bed cleaning technology allows chipped eucalyptus wood to be utilized as a fuel in a clean and efficient manner. The energy system for Sicily meets stringent air emissions requirements established by the European Union regulations.

EPI is proud to offer our technology for this state-of-the-art facility in Sicily, Italy.

Barnesville, Georgia

Energy Products of Idaho has been selected to provide a state-of-the-art green energy system for the Piedmont Green Power project in Barnesville, Georgia. The EPI advanced staged gasification system is designed to convert biomass materials into 480,000 lb/hr, of superheated steam at 1005° F and 1500 psia for the 53.5 MWe net renewable energy application. Zachry Industrial, Inc., a subsidiary of Zachry Holdings, Inc., is the engineering, procurement, construction (EPC) contractor for the entire project.

In this application, EPI's advanced staged gasification technology allows chipped biomass materials to be utilized as a fuel in a highly efficient manner.

EPI's fluidized bed technology offers excellent operating characteristics and superior emissions performance while providing a method of extracting usable energy out of a wide variety of fuels.

EPI has designed and provided fluidized bed energy systems for over thirty-eight years with nearly 100 installations worldwide. Specializing in converting difficult waste products into usable forms of energy, EPI is a leader in flexible fuel energy systems. EPI has twice received Power Magazine's prestigious "Power Plant of the Year" award for fluidized bed energy systems in the USA.

EPI is proud to team with Zachry, a premier EPC contractor, and Piedmont Green, a sophisticated owner, for this offer to use our technology for this state-of-the-art facility.

EPI PILOT PLANT

3 TO 4.5MM BTU/HR - 9SQ. FT. BED AREA

EPI entered the market place as a supplier of fluid bed technology to the wood industry in the 1970's. Keeping pace with industry, EPI embraces opportunity fuels that other energy suppliers may chose not to use. For this reason EPI maintains a fully functional pilot plant and is constantly upgrading the facility to address new fuels, diverse applications and to expand our technologies. Our Fluid Bed Combustor is an engineer's work shop fully capable of being modified to suit any scenario we will encounter in the field.

Our current pilot unit reflects our dedication to new fuels and markets and features a 9sq. ft. bed with 24ft. of freeboard for a 2 second residence time at typical velocities. We have interchangeable modules for inbed and vapor space tube applications, various levels of overfire air and an SNCR injection section for NOx control.

EPI Pilot Plant Gasifier Test Facility

EPI has added an atmospheric fluidized bed gasifier to its Pilot Test Facility. Suitable biomass may be partially combusted in the gasifier to form a combustible gaseous product (syngas) which may then be cleaned and used in an internal combustion engine or possibly converted directly into ethanol or biodiesel. EPI fluidized bed gasification combines the efficiency of Updraft Packed Gasifiers, the flexibility of Downdraft Packed Gasifiers and the stability of Crossdraft Packed Gasifiers while adding the ability to follow load swings very rapidly.

The EPI gasifier is an 8 inch inside diameter, refractory lined and insulated gasification chamber capable of being either air blown or steam & oxygen blown. An air blown gasifier will give a Low BTU gas while oxygen and steam blown will give a Medium BTU gas with more of the long chain hydrocarbons cracked, resulting in less tar. The syngas produced passes through an insulated cyclone for char removal and then can go through a boiler designed and manufactured by EPI to simulate cooling of the syngas. Steam from the 100 psig rated boiler can be used for fluidization or vented. Normally the syngas will be flared off in the existing 3'x3' pilot combustor and the resulting off-gasses cleaned by a pulse-jet baghouse. A clean gas conditioning chamber could be added for clean gas tests. A gas chromatograph is planned to give real time analysis, thus allowing optimization of the steam/oxygen ratio and gasification temperature. Fuel is introduced into the gasifier through a metering screw, a rotary air-lock and then through a fixed speed feed auger. Fuel must be sized 1 inch or smaller for testing in this pilot facility.



Pilot Plant & Baghouse



New Pyrolysis Unit



Gas Cooler / Boiler



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Up Coming Events in Marketing:

EPI will be in Orlando exhibiting at Power-Gen International next month, 12/13 thru 12/16. Patrick Travis will be presenting a paper on boiler retrofits with fluidized bed technology.

Jim Starkey will be presenting a paper on Biomass Power Generation Utilizing Flexible Fuel Fluidized Bed Technology at the 2011 Pacific West Biomass Conference & Trade Show in Seattle, WA January 10-12.

EPI is exhibiting and Jim Starkey will be participating in a panel discussion on Utility Scale Biopower at the Renewable Energy World Conference and Expo North America 2011 March 8-10 at the Tampa Convention Center in Tampa, FL.

Technical Publications

This year Patrick Travis presented papers at Power Engineers Renewable Rendezvous, Northwest Biomass Conference, Coal-gen 2010, the Southern Biomass Conference, and the Powergen International Conference and Trade Show. These papers covered topics on the retrofit of coal boilers with fluidized bed thermal oxidizers and gasifiers.

Jim Starkey presented a paper on Gasification Systems at the International Conference on Thermal Treatment Technologies and Hazardous Waste Combustors in San Francisco, CA on May 18, 2010 and on Biomass Power Generation at the Fuel Ethanol Workshop and Expo in St. Louis on June 16th.

Visit EPI's web site for access to other technical publications including:

- Green Power Initiative - Renewable Green Energy In Fossil Fuel Fired Power Plants using Low-Impact Biomass Gasifier Additions for Coal and Oil Fired Facilities.
- Board Plant Energy Systems with Total VOC Destruction Using Closed Loop Fluidized Bed Combustion Technology
- Paper Sludge: Waste Disposal Problem or Energy Opportunity
- Flexible Fuel Boiler Curves "The Natural Gas Blues"
- Repowering Options: Retrofit of Coal-Fired Powered Boilers using Fluidized Bed Biomass
- Gasification Advancing Waste-to-Energy Technology Design and Performance of EPI Fluidized Bed RDF-Fired Power Plants