ENERGY PRODUCTS OF IDAHO

EPI NEWSLETTER

EPI NEWSLETTER WINTER - 2007

WHAT'S NEW AT ENERGY PRODUCTS

Natural Gas Blues

Historically, ethanol plants and other industrial steam users have produced steam with natural gas-fired boilers. These gas boilers are relatively inexpensive to construct but leave their owners completely dependent upon the volatile natural gas market. Price fluctuations, supply disruptions and curtailment in the natural gas market have had, and will continue to have, a substantial impact on the profitability of these plants. The bottom line profit impact caused by wild increases in natural gas prices is the basis of "The Natural Gas Blues." Many companies have cured "The Natural Gas Blues," increasing their profitability and limiting their energy cost fluctuations by adding an EPI flexible fuel boiler system. **An EPI flexible fuel fluidized bed energy system provides an alternative to natural gas with significant decreases in energy costs. So significant, in fact, that the capital costs incurred can be repaid, in fuel savings alone, within one to three years depending on the alternative fuel available.** Escaping the natural gas trap is important, but it is equally important to not get stuck with the next high cost fuel. Installing a boiler that can handle a variety of fuels in the same boiler system provides long-term energy security at predictable costs. Most of the flexible fuel fluidized bed systems installed by EPI are operating on a different fuel mix than what they were originally designed to handle. The ability to change fuels as fuel prices and availability change is a critical component in keeping a plant profitable in an ever-changing energy market.

Corn L.P. - Goldfield, IA - 2006

220MMBtu/hr - PRB Coal

Lincolnway Energy - Nevada, IA

220MMBtu/hr - PRB Coal - 2006

Red Trail Energy - Richardton, ND

220MMBtu/hr - Lignite - 2006/7

SPECIAL POINTS OF INTEREST:

- *Flexible Fuel Technology*
- *Projected Annual Fuel Costs*
- *New Projects*

INSIDE THIS ISSUE

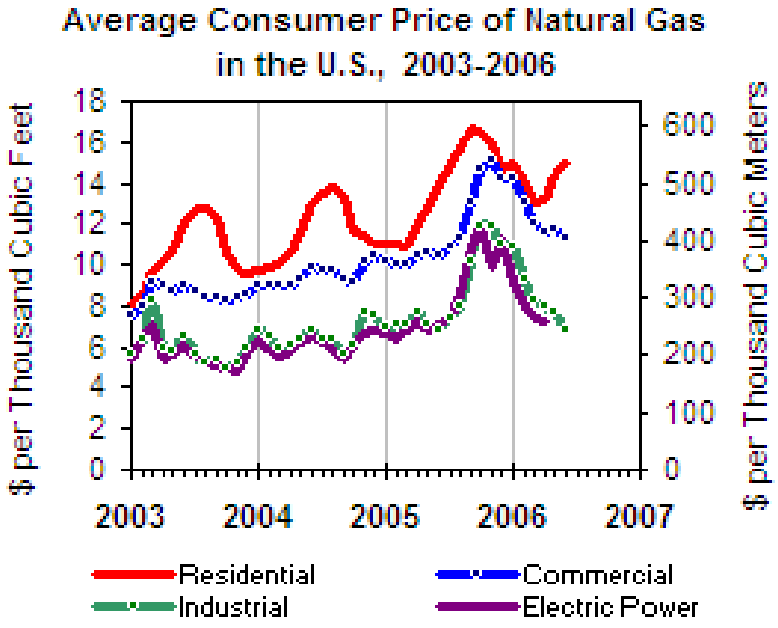
Flexible Fuel Boiler Cures – "The Natural Gas Blues"

Annual Fuel Cost (Estimates) - Based on 8500 hrs/year.

Fuel Costs $/MMBtu/ ton	Natural Gas 9.70	Coal 2.60	Wood 2.50	Ag Waste 0.81	Tires/C&D -0.50	RDF -2.20
Boiler Size - PPH Steam -		@ 150psi	Saturated		Tipping Fee	Fuels $$$
75,000	$6,595,952	$1,767,987	$1,699,988	$550,796	-$339,998	-$1,495,989
100,000	$8,794,602	$2,357,316	$2,266,650	$734,395	-$453,330	-$1,994,652
125,000	$10,993,253	$2,946,645	$2,833,313	$917,993	-$566,663	-$2,493,315
150,000	$13,191,903	$3,535,974	$3,399,975	$1,101,592	-$679,995	-$2,991,978
175,000	$15,390,554	$4,125,303	$3,966,638	$1,285,191	-$793,328	-$3,490,641
200,000	$17,589,204	$4,714,632	$4,533,300	$1,468,789	-$906,660	-$3,989,304
225,000	$19,787,855	$5,303,961	$5,099,963	$1,652,388	-$1,019,993	-$4,487,967
250,000	$21,986,505	$5,893,290	$5,666,625	$1,835,987	-$1,133,325	-$4,986,630
275,000	$24,185,156	$6,482,619	$6,233,288	$2,019,585	-$1,246,658	-$5,485,293
300,000	$26,383,806	$7,071,948	$6,799,950	$2,203,184	-$1,359,990	-$5,983,956
325,000	$28,582,457	$7,661,277	$7,366,613	$2,386,782	-$1,473,323	-$6,482,619
350,000	$30,781,107	$8,250,606	$7,933,275	$2,570,381	-$1,586,655	-$6,981,282

FIGURE 1, ESTIMATED FUEL COST COMPARISON

While Figure 1 shows a fixed natural gas price of $9.70 per MMBtu, it is important to note the price volatility in natural gas over the past few years as the chart below depicts.



Project capital costs incurred can be repaid, in fuel savings alone, within one to three years depending on the alternative fuel available

FLUIDIZED BED COMBUSTOR OPERATING TIPS

The purpose of this column is to offer bits of information that may have been forgotten over time.

Bed Depth

The recommended bed depth for an EPI combustor is 18-24 inches measured from the top of a nozzle to the static bed level before start-up. With the combustor in service and at normal operating temperatures, the bed differential pressure should be noted. The indicated bed differential should reflect 100-125% of the static measurement, therefore a 24 inch static bed should reflect a 24-30 inch bed differential pressure.

Operating outside of the recommended range: Too much bed depth creates additional FD fan back pressure which decreases underbed air flow, increases bed temperatures, decreases fluidization and increases the chance of clinkering the bed. Too little bed depth exposes bed thermocouples leading to false bed temperatures readings. Extremely low levels increase the chance of bed "blowout". This phenomenon exposes the nozzles to the furnace temperatures cause massive nozzle failures. During routine inspections, note the color and texture of your nozzles. A whitish color indicates the bed may be too low. Swelling and cracking indicate heat fatigue. During a hot standby it is recommended to operate the underfire air to drop the bed of sand temperatures 50-100F After the solid fuel is removed. This technique provides a cool layer next to the nozzles and protects them during a shutdown.

If you have any questions please don't hesitate to contact EPI customer service:

cserv@energyproducts.com

Ph: 208-765-1611

Fax: 208-765-0503

WHAT IS "HOT STANDBY" ?

Hot standby is a condition wherein the combustor is shut down for a period of time to allow a planned or unplanned system repair. The bed remains ready to restart as quickly as possible without having to preheat for solid fuel feed. Hot standby is accomplished by stopping the solid fuel feed, reducing the bed temperatures by 50-100F, and then bottling the combustor to hold in the residual heat. Bottling involves stopping all fans and closing all dampers to prevent air flow through the unit. The amount of time a combustor will hold it's temperature depends on how sealed your system is. **A fluidized bed combustor can remain in hot standby for as long as 16 hours.** One unit recently had to be shut down for a baghouse repair. This plant was feeding (PRB) Powder River Basin coal. The combustor was placed in a hot standby at 1400F bed temperatures and successfully restarted after 16 hours with no preheat burner assistance. Maintaining the system in a hot standby also relives the stress on the refractory during start-up because the refractory holds it's temperature, allowing for a faster return to service without the normal soaking time requirements. Shared Experiences? Contact EPI Customer Service.

A FLUIDIZED BED COMBUSTOR CAN REMAIN IN HOT STANDBY FOR AS LONG AS 16 HOURS !

SOLID FUEL VARIABLES

Heat Release

Heat release is affected by particle size, moisture, density and fuel composition. Fed above bed, larger fuel particles tend to drop to the bed while smaller particles tend to drift upward and are consumed in the vapor space. Before any fuel that can combust the fuel temperature must exceed 200F and the surface bound moisture cooked off. Dense fuels tend to release more heat in the bed whereas lighter fuels tend to volatilize faster contributing to upper vapor space temperatures. During normal operations changes in fuel characteristics can be readily identified. Process variables are keys to changing conditions. Here are some examples: **Overfire Air** : If the output to the overfire air increases it usually indicates that the fuel is becoming lighter or you are generating more volitiles. Lighter fuels will increase vapor temperatures with a corresponding drop in bed temperatures.

If both bed and vapor space temperatures begin to drop it could indicate a loss of fuel, an increase in moisture content or a decrease in the fuel heating value/quality. Drops in quality and higher moisture fuels will dictate increasing the feed rate to compensate for the heat loss. If you have any questions regarding fuels please consult our fuels list at:

energyproducts.com

Contact customer service for any related questions.

NEW PROJECTS

ENERGY PRODUCTS OF IDAHO TO PROVIDE COW MANURE FIRED ENERGY SYSTEM FOR PANDA HEREFORD ETHANOL, LP IN HEREFORD, TEXAS

Coeur d'Alene, Idaho USA, September 2006 . . . Energy Products of Idaho (EPI), a leading provider of solid fuel energy systems, has been selected to provide the ethanol industry's first fluidized bed energy system that converts cow manure into usable energy. EPI is supplying the facility to Panda Hereford Ethanol of Dallas, Texas. The contract includes equipment from the fuel receiving/storage/handling systems to the boiler island and stack. While the boiler island features EPI's latest fluidized bed technology that is designed to handle difficult biomass fuels, it is also capable of being fueled on coal, cotton gin and a variety of other biomass materials.

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's energy system at the Panda Hereford plant will meet stringent air emissions requirements established by the plant operating permit in a clean, odor-free manner.

EPI has been supplying fluidized bed energy systems for thirty-three years with nearly 100 installations worldwide. Specializing in converting difficult waste products into usable forms of energy, EPI has more fluidized bed systems operating on a wider variety of fuels than any other supplier. EPI has twice received Power Magazine's prestigious "Power Plant of the Year" award for facilities in the USA.

Over the past two years, EPI has been awarded six contracts for energy systems in the ethanol industry. These systems are fueled on biomass and coal.

EPI is proud to partner with Panda Hereford Ethanol, LP to produce this state-of-the-art facility.

EPI

ENERGY PRODUCTS OF IDAHO

Energy Products of Idaho
4006 Industrial Ave.
Coeur d'Alene, Idaho

Phone: 208-765-1611
Fax: 208-765-0503
Email: cserv@energyproducts.com

WE'RE ON THE WEB !

ENERGYPRODUCTS.COM

TECHNICAL PAPERS?
CHECK OUT OUR WEB SITE !