



FOCUS ON...

Waste to Ethanol: Ushering in a New Industry

"This facility is a giant step towards alternative fuels that are domestically produced and based on renewable, low-polluting energy sources. We can look forward to a day when a ton of biomass will be traded like a barrel of oil is today."

*Bill Richardson,
U.S. Secretary of Energy*

A new industry in renewable transportation fuel was launched in Jennings, Louisiana, where BC International (BCI) became the first company to dedicate a facility to produce ethanol from agricultural residues. At this plant, sugarcane waste and rice hulls will be converted to ethanol.

BCI officials, along with government and industry leaders, believe that this waste (which is usually either burned or plowed under), will be a profitable and environmentally friendly commodity. It often costs nothing, and sometimes less than nothing. According to Dan Reicher, assistant secretary for the U.S. Department of Energy's (DOE's) Energy Efficiency and Renewable Energy, "People are paying to get rid of these materials."

Jennings, located in the Jefferson Davis Parish of southwestern Louisiana, has a population of about 12,000. It is known alternatively as the "garden spot of Louisiana" because of its rich farmland, and as "the cradle of Louisiana oil," because the first oil wells in the state were drilled there in 1901.

continued on page 2



The first bagasse to be shoveled – the beginning of a new industry.

Bubba Patin (BCI), Ric Abel (Prudential Capital Group), Clinton Norris (BCI), Mr. Torigoe (Marubeni America), John Ferrell (DOE), Dan Reicher (DOE), Stephen Gatto (BCI), Randy Kob (Prudential Capital Group), Ray Katzen (Independent Consultant)



ON THE FEDERAL FRONT

Mixed Bag – 1999 Federal Budget

On October 7, President Clinton signed the final Conference Report for the 1999 Energy and Water Development Appropriations. Biofuels seem to be in a good position. The Conference Report budget is higher than this year's budget as it currently stands. But it does contain monies earmarked for specific projects, which could force DOE to cut certain research, education, and outreach project areas. "Biofuels

are doing well. The budget is at \$31 million this year and for 1999 it stands at \$41.75 (36% increase), a very heartening result," said Megan Smith, American Bioenergy Association (ABA). House and Senate report language, however, seeks to restrict the interaction of industry associations with DOE. However, The Sustainable Energy Coalition calls it a "politically motivated attack on renewable energy technologies."

The Conference Report allocates \$1.75 million for the Gridley, California, rice straw-to-ethanol plant project which, combined with amounts previously provided, results in a total of \$5 million available for the Gridley project. The Conferees also recommended \$2.5 million for regional programs, and \$4.6 million for feedstock development. The Omnibus bill added an emergency supplemental \$60 million to the

Waste to Ethanol: Ushering in a New Era (continued)


BCI chose this location because the plant already has a good deal of infrastructure (including natural gas and wastewater treatment systems); it is situated on the river, which provides barge access to the Gulf of Mexico and the Mississippi River; and rail tracks run a quarter of a mile away. Another benefit to this situation is BCI's acquisition of equipment from a shut-down furfural plant, reducing the company's start-up costs.

Representative Chris John (D-LA) says the impact of a \$90 million facility and the attendant 350 construction jobs is "significant because it pumps a lot of revenue and jobs into the local area." Jack Giovo, Jefferson David Parish economic director, agrees. "The impact could be phenomenal," he stated.

The project launch

At 4:00 p.m. on October 20, more than 250 people watched as the first sugarcane bagasse was shoveled into the pilot-scale reactor at the 110-acre facility. Dan Reicher presented a \$5 million check from DOE to complete the DOE \$11 million commitment to the project. DOE invested this money for "the good of the economy and the good of the environment," he said.

The plant will use a genetically engineered organism (developed and patented by the University of Florida) to convert organic waste into ethanol. The facility will be retrofitted with new vessels, piping, and controls; equipment will be replaced; a cogeneration facility will be built to create electrical power for the plant; and the entire operation will be gradually ramped up. The renovation is expected to take 12–18 months.

Eric Vaughn, president of the Renewable Fuels Association, said, "The potential for significant expansion is astounding when you look at the near-limitless resources available from agricultural crops, waste products, and residues." The groundbreaking was reported by the *New York Times* and affiliates, *Industry Week*, National Public Radio, Reuters, and several Louisiana print and nonprint media. 

"This is a big event for DOE and the Office of Fuels Development (OFD). "This is the first industrial-sized cellulosic plant, so it involves higher financial risks than we'd expect from later plants. The program has been successful so far because organizations such as OFD, the National Renewable Energy Laboratory (NREL), BCI, and some coalitions have worked hard to garner support for ethanol."

*John Ferrell
Director of OFD*

At the Jennings plant, BCI will produce 20 million gallons of ethanol per year initially; its long-term annual goal is 25 million gallons. The ethanol can be used to fuel cars, generate electricity, and provide raw materials for the chemical industry.

BCI will have a positive impact on the local economy.



renewables budget: \$42 million is designated for uncosted balances; \$18 million will be used at the Secretary's discretion.

In addition to these funds, the Conference agreement includes \$750,000 for the Plumas County ethanol project and \$4 million for the Sacramento Valley ethanol project and urged the Department to complete the Jennings, Louisiana plant" (see BCI story on page 1).

The House Renewable Energy Caucus has grown from 120 to 133 (61 Republicans; 71 Democrats; one Independent). This illustrates the growing support in the Congress for renewables. A Senate Renewables and Energy Efficiency Caucus was also recently formed, chaired by Senator Wayne Allard (R-CO) consisting of 14 Senators (five Republican; nine Democrat).

Senate Conferees: Pete Dominici (R-NM), Thad Cochran (R-MS), Slade Gorton (R-WA), Mitch McConnell (R-KY), Bob Bennett (R-UT), Conrad Burns (R-MT), Larry Craig (R-ID), Ted Stevens (R-AK), Harry Reid (D-NV), Robert Byrd (D-WV), Fritz Hollings (D-SC), Patty Murray (D-WA), Herbert Kohl (D-WI), Byron Dorgan (D-ND), Daniel Inouye (D-HI)

House Conferees: Joseph McDade (R-PA), Harold Rogers (R-KY), Jim Knollenberg (R-MI), Rodney Frelinghuysen (R-NJ), Mike Parker (R-MS), Sonny Calahan (R-AL), Jay Dickey (R-AR), Bob Livingston (R-LA), Vic Fazio (D-CA), Peter Visclosky (D-IN), Chet Edwards (D-TX), Ed Pastor (D-AZ), David Obey (D-WI) 



IN THE SPOTLIGHT

Fueling the Environment: Switchgrass Research Review

There is a great deal of interest in ethanol feedstocks, as illustrated by the programs that focus on rice straw and corn starch. Most ethanol now in use is made from corn, and its net energy gain is about 21%. But according to Charlie Taliaferro, plant breeder and a regents professor in the Oklahoma State University (OSU) Department of Plant and Soil Sciences, perennial grasses such as switchgrass have great potential as energy crops. Switchgrass is a perennial and requires as little as one-fourth the irrigation and fertilization than row crops. Sandy McLaughlin, herbaceous task leader at Oak Ridge National Laboratory (ORNL), estimates the energy output/input ratio for switchgrass is 4.4, representing a net energy gain of 343%.

Another reason for the dramatic increase in interest for switchgrass is that 35 million acres under the Conservation Reserve Program (CRP) might be used for this hearty plant. Switchgrass is found from Canada to South America and can grow to be 10 feet tall. U.S. Department of Agriculture (USDA) figures show that an acre of switchgrass will produce 20.6 times the amount of energy required to make ethanol.

Some switchgrass programs examine the potential, develop test facilities, and design future industrial-size production centers. The OSU program is one of many currently being run at national laboratories and universities. DOE funding for switchgrass has been made available to the five Regional Biomass Energy Programs and the Western Regional Biomass Energy Program (WRBEP) has three programs from this year's funding awardees that deal directly with switchgrass. This is in addition to funding

sources that have been made available by the states, private industry, and other federal funding.

Among those funded by WRBEP, Kansas State University (KSU) was awarded \$75,000 along with \$124,474 in matching funds. The funds are intended to evaluate switchgrass production, how production costs can be reduced, maximizing feedstock sales,

and attracting the interest of heat and electricity markets toward these energy resources. KSU will also examine the ability of switchgrasses to reduce reservoir sedimentation while improving water quality and production yields. The final piece of this effort is to grow switchgrass on CRP land. For more information, contact Richard Nelson at 785.532.4999.

The University of North Dakota (UND) was awarded \$25,000 to examine the feasibility of locally grown feedstocks, aspen trees, and switchgrass, being planted on marginal farmland and used to produce ethanol. This would benefit the state's two ethanol facilities by providing more feedstock options. For information, contact Mike Mann at 701.777.5193.

OSU was granted \$75,000 (with \$220,093 in matching funds) from WRBEP to find the best ways to grow, harvest, transport, store, and process the new feedstocks. These funds were in addition to other funding. For further information, contact C.B. Browning at 405.744.9694. *continued on page 4*



Todd Johnson/PIX 06691

“Our research with switchgrass is part of a larger effort to develop the native grass as a model herbaceous crop for feedstock in the production of biofuels,” Taliaferro explained. “It is part of DOE’s National Bioenergy Feedstock Development Program administered by Lockheed-Martin at ORNL.” Taliaferro went on to say that, “Our objectives are to develop varieties with improved biomass yield potential and adaptation features that fit various soil and climatic needs. We are developing a switchgrass germplasm collection for future use in plant breeding and other scientific investigations.” Biomass yields as much as 20% over the base populations have been found in some of Taliaferro’s breeding materials, but he cautions that more testing is necessary to accurately assess relative performance.

Two programs at OSU examine switchgrass for cofiring with coal. In this capacity, switchgrass is thought to have a capacity as a clean-burning, high yield, and inexpensive energy source.

Another large-scale program, a 4,000-acre experiment, is being conducted by a conglomerate of agriculture, business, education, and government groups in a four-county area in south central Iowa. The Chariton Valley Resource Conservation and Development District, a USDA-chartered nonprofit organization, manages this program. The DOE Biomass Power Program also sponsors it. The \$20 million multi-year project has the support of hundreds of farmers in the region. As of June 1998, 75% of the acres were planted. Each acre should produce 4–6 tons annually, which will sell for \$40–\$45/ton. In addition, this program will allow the study of impacts on wildlife that would not be possible in a small-scale program.

These and other programs, funded and supported by state, local, and federal governments; and by the agricultural, educational, and business sectors, make for a well-founded concept: growing energy instead of mining or drilling for it from finite reserves at great environmental cost.



DID YOU KNOW?

Upcoming Conferences and Events

Ethanol Producers and Consumers (EPAC) Annual Conference

January 25, 1999
Helena, Montana

Contact: Shirley Ball
406.785.3722

National Ethanol Conference on Policy and Marketing

February 22–24, 1999
Las Vegas, Nevada

Contact: Bryan & Bryan
719.942.4353

21st Symposium on Biotechnology for Fuels and Chemicals

May 2–6, 1999
Fort Collins, Colorado

Contact: Liz Willson
303.275.4457

page 4

Produced for the National Biofuels Program, Office of Fuels Development, U.S. Department of Energy
1000 Independence Ave., S.W., Washington, DC 20585-1121
DOE/GO-10098-674 For more information, contact the National Alternative Fuels Hotline at 800-423-1DOE.



Midwest Research Institute
National Renewable Energy Laboratory
National Alternative Fuels Hotline
1617 Cole Blvd., MS 1633
Golden, CO 80401



NONPROFIT
U.S. Postage
PAID
Permit No. 258
Golden, Colorado