BlueFire Fulton Renewable Energy Project

This project involves the development, construction, and operation of a biorefinery producing ethanol and other co-products from cellulosic materials that utilize a patented concentrated acid hydrolysis process.

The Project would produce more than 18 million gallons per year of denatured ethanol from approximately 700 metric dry tons per day of cellulosic materials that consist primarily of wood wastes. The cost to construct the facility is approximately $320 million (the Energy Department share is ~27%). More information is available on the BlueFire website.

Project Description

The proposed biorefinery would be located on an approximately 40-acre site within the Port Itawamba Industrial Park in Fulton, Mississippi.

The feedstock for the facility would consist of unmerchantable timber, logging residues, and/or merchantable volumes of both softwood and hardwood within counties located within a 75–100-mile radius of the site. Feedstock would be supplied under a 15-year contract with Cooper Marine Timberlands. The ethanol produced from the facility would be sold to Tenaska Biofuels under a signed 15-year contract.

Permits required for construction have been issued and site preparation including rough grading and drainage have been completed. The engineering, procurement and construction contract has been awarded to Mastec North America. A Front-End Level 3 engineering design effort has also been completed for the project.

For the concentrated acid hydrolysis process, which will be used to produce ethanol, the feedstock is mixed with sulfuric acid in enclosed hydrolysis units producing a liquor made up of insolubles (e.g., lignin and inorganics) and solubles (e.g., sugars and acid). A solid/liquid separation takes place to remove the insoluble lignin-cake. This lignin-cake is ejected from a conventional filter press and used in a boiler to generate steam for the process. The liquids—consisting of acid and sugar—move to a separations process. The acid is separated from the sugar, recovered, re-concentrated by evaporating the water, and reused in the process. The sugar stream, which is slightly acidic, is neutralized with lime to produce gypsum. The neutralized sugar stream, consisting primarily of glucose and xylose, is converted into ethanol through fermentation using non-GMO (genetically modified organism) yeasts. The ethanol is distilled, purified, and denatured with gasoline to produce fuel-grade ethanol for shipment off-site by rail or trucks. The yeast residues from the fermentation process (primarily protein) are removed and sold as animal feed.

Fulton project site in Mississippi

Co-generation of steam and electrical demand would occur using lignin and supplemental biomass fuel.

Potential Impacts

A biorefinery of this type creates long-term, high-paying, permanent jobs that involve producing replacements for imported oil. The bioethanol produced displaces gasoline, and using life-cycle models, clearly reduces net emissions of carbon dioxide.

Prime	BlueFire Renewables
Location	Fulton, Mississippi
Feedstock(s)	Un-merchantable lumber, logging residues or chips, sorted MSW
Size	700 metric tonnes per day
Primary Products	Ethanol, animal feed, internal heat/power, gypsum
Capacity	Gallons per year of product
Award Date	September 2007 and December 2009
GHG Reduction	80% reduction versus fossil product
Anticipated Job Creation	65–70 permanent, and up to 750 during peak construction
Company Contact	Necy Sumait (nsumait@bfreinc.com) 949-588-3767

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