

Flambeau River Biofuels, LLC

Flambeau River Biofuels, LLC (FRB), will build a modern, integrated, profitable, biofuels project using “forest residue” feedstock. This new business—which will be a model of low-cost, environmentally friendly biofuel production—has support from community leaders, 67 Wisconsin legislators, State government, and Federal Representatives from Wisconsin.

Project

FRB is co-located on existing Flambeau River Papers (FRP) property and shares utilities and waste water treatment. The proposed project will use 1,900 bone dry tons per year of forest residual biomass and produce two significant revenue streams. The first stream will be 40 million gallons per year of sulfur-free Fischer–Tropsch (FT) liquid, a transportation fuel with many characteristics superior to light sweet crude. The FT liquid can be processed in a modern petroleum refinery and distributed through existing petroleum infrastructure and can replace higher value petroleum products. The second revenue stream is 2 trillion Btu per year of heat and power, which will allow FRP to become the first fossil-fuel-free North American pulp and paper mill. The sale of recovered heat will provide unique economics, allowing liquid to be produced for under \$1.00 per gallon, with a projected full-year EBITDA of \$60 million.

Benefit to the Nation

Shrinking supplies of petroleum will cause prices to increase until demand is balanced. The United States is one of the countries that will be hurt the most, and our response this decade will determine our future standard of living. Renewable fuels will be a big part of that response. We need all the corn-based ethanol that can produce, and we need cellulosic ethanol to come on stream faster than current projections. However, ethanol does not address diesel needs in barge, truck, rail, and air transportation or the military’s strategic need for jet fuel. Fischer–Tropsch liquids have been refined to superior grades of green gasoline and green diesel for over 50 years. This project will be a major starting point for expansion of the technologies to provide strategic fuels that ethanol cannot.

Benefit to Wisconsin

The project is expected to provide 540 temporary jobs, 24 mill jobs, and 300 support jobs. It will provide Park Falls and the State with a new tax base. Some of the wealth from replicated facilities in other states will flow back to northern Wisconsin. Finally, new technologies and applications will emanate from the FRB, Park Falls, facility.

Benefit to FRP


First, the current mill will have lower energy costs. Second, it will not be disrupted by natural gas curtailments, which have been typical. Third, it will be the first pulp and paper mill in North America to be fossil fuel free for its thermal needs. Fourth, the green fuels project will bring new talent and skills to the site. If paper production were curtailed, paper machine could be replaced by steam turbines, which could be connected to the U.S. electric power grid—the steam once used for paper drying could be used to meet the ever-increasing demand for “green power.”

Benefit to the Environment

The process is environmentally friendly, using no fossil fuel and only 1.56 gallons of water for each gallon of liquid fuel (compared with 18 gallons of water per equivalent gallon of ethanol for a best-practice corn ethanol plant). The FRB project will eliminate 859,000 tons per year of carbon dioxide from the petroleum fuel replaced—almost a million barrels of oil per year—using renewable, non-edible feedstock.

Process

Futurewood Corp. will recover and transport biomass (e.g., tree limbs, tree tops) from within 150 miles of Park Falls, Wisconsin. The biomass will be fed into a ThermoChem Recovery International (TRI) steam reformer and gasified. The product gas, called syngas, once cleaned, becomes chemically identical to syngas from coal gasification. This syngas will then be fed through a gas-to-liquids FT catalytic process. Murphy Oil Company has expressed interest in an off-take agreement to purchase the FRB product for their nearby Superior, Wisconsin, refinery.



Gasification involves heating of a carbonaceous solid in the presence of controlled air/steam or oxygen. The TRI process breaks down the organic molecules to their lightest fraction, which is mostly hydrogen, carbon monoxide, and carbon dioxide. The non-toxic, inorganic fraction is removed as ash and can be used as filler in construction materials or disposed of in a landfill.

Gasification followed by gas-to-liquids conversion has been used on coal for over 50 years. Gasification allows 100% of incoming raw material to be converted, whereas most other processes utilize only the cellulose portion. This gives gasification to liquids a 35% yield advantage over other technologies, assuming that the heat generated is recovered and reused. The FRB gas to liquids process will be designed by Ken Agee of Emerging Fuels Technology (EMT), who designed the Fischer–Tropsch device that successfully converted natural gas to a feedstock that was refined and blended with aviation fuel for a B-52 aircraft.

Flambeau River Papers Assets at Park Falls

FRP makes and sells 410 tons per day of printing papers per day and has met all cost objectives since Johnson Timber took ownership of FRP in mid-2006. It produces 160+ tons per day of hardwood sulfite pulp used in the papermaking process, has a recycling facility, and buys market pulp as needed. The existing pulp line

is unique in that spent pulping liquors are not burned but are processed offsite for greater value. The lignin is removed and sold into various markets. Xylose, the largest hemicellulose present, is separated and processed into xylitol. Therefore, FRP is already an experienced biorefinery in the forest products industry on a sugar platform.

Johnson Timber and Futurewood, both affiliates of FRP and FRB, have unique track records of success in their businesses. Keys to their past success—valuing results more than ego, recruiting superior innovative partners, focusing on customer needs, and sharing the resulting success—are the same keys proposed for the biomass-to-fuel project.

Citigroup is leading the project financing, which is expected to total approximately \$250 million. In addition to the principals at FRB, the project finance team consists of Foley & Lardner, LLP, counsel to FRB; Hunton & Williams, counsel to Citigroup; BGR Holding, LLC, governmental relations consultant; certain other entities covering the supply of biomass feedstock; and technology partners, including ThermoChem Recovery International (TRI) and Emerging Fuels Technology (EMT).

Contact

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