Integrated Biorefinery Demonstration Plant Producing Cellulosic Ethanol and Biochemicals from Woody Biomass

Lignol Innovations Inc. (Lignol) is developing a demonstration plant for the continuous production of cellulosic ethanol, high purity lignin, and furfural from hardwoods. The plant will use Lignol's proprietary integrated biorefinery process which has been extensively pilot-proven on a wide variety of biomass feedstocks.

Lignol's technology is an integrated biorefinery process which consists of

- A well-proven modified organosolv pretreatment process for preparing cellulose for bioconversion.
- A proprietary bioconversion process, which itself is based on well-proven enzymatic hydrolysis and fermentation techniques, for producing ethanol.
- A number of established recovery processes to recycle solvent and to produce valuable co-products.

The most notable co-product is HPTM Lignin, a unique form of lignin having many potential applications where it will displace conventional petrochemicals in the chemical, forest products and materials industries. The use of HP-L Lignin contributes to the exceptionally low carbon footprint of the Lignol Biorefinery - the plant will produce ultra-low carbon cellulosic ethanol.

The interior workings and the design model of Lignol's demonstration-scale plant.

Project Description

The plant, to be located in Ferndale, Washington, will process 100 tpd of woody biomass, initially local hardwood which is plentiful within a 50 mile radius of the plant, and in future test campaigns, softwood and agricultural residues. The feedstock, which will come from local residues, will be chipped offsite and transported to the site by truck—the site is exceptionally well placed near highways, railways and a deepwater port. The resulting ethanol will be blended into the local gasoline supply. Lignin will be delivered to selected customers across the US, in biochemical applications.

Potential Impacts

A vital step on the path to realizing the goal of extensive commercial production of cellulosic ethanol in the United States is the demonstration of the process at reduced scale. By funding this 10% scale demonstration plant, DOE is assisting in proving and de-risking Lignol's process technology, opening the way to commercial deployment across the country—future expansion of capacity at the Ferndale site is also possible. The facility could become the cornerstone of a wood-based cellulosic ethanol industry supplying the Pacific states.

Other Participants

Lignol is assembling a consortium of strategic and financial partners to build, own, and operate the facility

Prime	Lignol Innovations, Inc.
Location	Ferndale, Washington
Feedstock (s)	Alder, Aspen, Poplar, and Cottonwood
Size	100 BD tonnes per day
Primary Products	Cellulosic Ethanol, Lignin, Furfural
Capacity	1.8 MGY ethanol, 5500 tonnes/Y lignin, 550 tonnes/Y furfural
Award Date	TBD
GHG Reduction	3 kg CO2 eqv/L of ethanol produced, 20,400 tonnes/Y
Anticipated Job Creation	200 people during plant build-out, 39 people for plant and business operations
Company Point of Contact	Michael Rushton, mrushton@lignol.ca, (604) 453-1242

July 2011