

High-Yield Hybrid Cellulosic Ethanol Process Using High-Impact Feedstock for Commercialization by 2013

ZeaChem will deploy their hybrid biochemical and thermochemical technology to produce fuel-grade ethanol from poplar and other feedstocks.

ZeaChem will construct a 250,000 gallon per year cellulosic biorefinery in Boardman, OR. The biorefinery will convert 10 bone-dry tons per day of cellulosic feedstock into ethanol. ZeaChem anticipates a 95% reduction in life cycle greenhouse gas emissions for fuel production in its commercial biorefineries compared to conventional gasoline. They also anticipate that this project will create approximately 19 jobs and once the ZeaChem process has been demonstrated and deployed, has the potential to create many more jobs throughout the United States.

www.zeachem.com

Project Description

The proposed facility will use a hybrid of biochemical and thermochemical processes. The technology uses chemical fractionation to separate the feedstock into a sugar-rich stream and a lignin-rich stream. The sugar stream is converted into acetic acid using naturally occurring bacteria, or acetogens, which produce no carbon dioxide during the fermentation



Harvesting of coppiced poplar by GreenWood Resources



ZeaChem's fermentation seed train

process and enabling 100% carbon conversion. The acetic acid is processed into an acetate ester; an intermediate bio-based chemical which can be marketed and sold. The ester is then converted into ethanol via hydrogenolysis.

Funds from this grant will be used to construct and operate an addition to ZeaChem's existing ethyl acetate pilot plant, resulting in a fully integrated cellulosic ethanol facility. The operations plan includes a step-wise start-up of the facility, followed by fully integrated operations. ZeaChem will begin running the integrated pilot plant on hybrid poplar trees supplied by GreenWood Resources, as the feedstock is readily available in the vicinity of the plant. After completing

the trials on poplar trees, ZeaChem will also run trials on alternative cellulosic feedstocks including corn cobs, corn stover, woody biomass, herbaceous grasses and other energy crops, etc. to ensure that their technology can be duplicated in other locations around the United States.

Potential Impacts

This project will create jobs, reduce greenhouse gases, and reduce the United States' dependence on foreign oil.

Other Participants

Valero Energy Corporation, CH2M HILL, GreenWood Resources, Andritz, Davy Process Technology

Prime	ZeaChem, Inc.
Location	Boardman, OR
Feedstock (s)	Hybrid poplar and other cellulosic feedstocks
Size	10 Tons per day
Primary Products	Ethanol and intermediate chemicals
Capacity	250,000 GPY
Award Date	TBD
GHG Reduction	95 % reduction versus conventional gasoline
Anticipated Job Creation	19
Company Point of Contact	Tim Eggeman, Ph.D., P.E., Chief Technology Officer, Founder, time@zeachem.com