

ZeaChem, Inc.

Overview

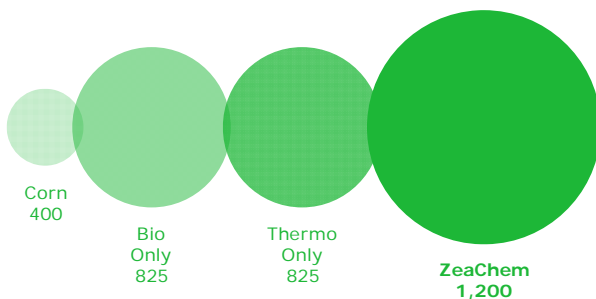
ZeaChem, Inc. is developing a cellulose-based biorefinery platform producing either ethanol or a broad portfolio of other chemicals. ZeaChem's indirect approach leap frogs the yield, capital and CO₂ problems associated with traditional ethanol production practices and other potential cellulosic based ethanol processes. ZeaChem currently operates a pilot plant at its Menlo Park, CA laboratory.

Process Advantages

ZeaChem's process combines biochemical and thermochemical platforms producing either ethanol or a broad portfolio of other chemicals. Utilizing a naturally occurring acetogen, found for example in termites, ZeaChem's process fully utilizes all of carbon. Thus, the energy of all fractions of the biomass ends up in the product.

For every bone dry ton (BDT) of biomass, ZeaChem's process will produce a theoretical maximum of 160 gallons of ethanol. Accounting for yield per acre, this is 3x more than corn based ethanol processes and ~1.5x more than either biological (enzymatic) processes or thermochemical (gasification) processes.

Theoretical Yield:
Gals of Ethanol/Acre



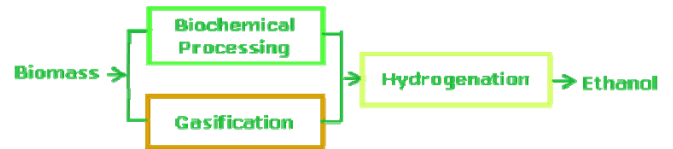
Economic Advantages

With a ~50% yield advantage, ZeaChem's process has the lowest operating (<\$1.00) and capital cost (<\$2.50) per gallon. Assuming a yield of 15 BDT/acre, a biomass farm with an 8 mile radius could support a ZeaChem biorefinery with capacity of ~300 million gallons per year. This translates into land productivity rates as much as 4.5x higher than existing approaches.

Quick Facts

Highest Theoretical Ethanol Yield: 160 gal/BDT
Highest Net Energy Value:
12+ renewable Btus out/1 fossil Btu in
Founded 2000/Series A 2006 with MDV & Firelake
1st Biorefinery site leased
Feedstock source secured

Process Diagram



Industrial Proven

Enhancing ZeaChem's economic advantage is the fact that all of the company's processes are based on industrial proven practices protected by the company's well architected patent portfolio. Using proven industrial process should accelerate scale-up; enabling ZeaChem to produce upwards of one billion gallons of fuel annually at less than \$1.00 per gallon.

Deployment

Following successful lab scale production campaigns, the company has begun its unique economic small scale low risk, low capital cost "Lego" block biorefinery deployment plan co-located with its feedstock supplier. This will allow the company to prove out its economic advantages with minimum risk and capital.

Management Team

ZeaChem's management team has a unique balance of energy industry expertise with deep knowledge in the crude oil refining (Koch Industries), biological processing (Coors), chemical manufacturing (Dow & Nature Works) and ethanol production (High Plains) industries.

Additionally, the management team brings extensive experience in chemical, biological and process engineering, business management, capital deployment, and risk management.

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