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The War on American Ethanol

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Course: ENSC230

The War on American Ethanol

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Biofuels are turning into a powerful part of the energy industry, and it seems as if there are no brakes engaging in the ethanol train. But it seems as if corn grains are our only crop that can keep up with demand in increasing gasoline blends. But can we balance food and fuel equally with corn grains alone?

Corn ethanol is the star of the show in today's biofuel market, currently producing 13.3 billion gallons of ethanol a year to be blended in gasoline. This boom in corn ethanol was due entirely to the Energy Independence and Security Act of 2007, set by President Bush. But because of the amount of useable and fertile enough land available for corn production is simply not enough to serve future food, fuel, and feed for livestock needs, corn ethanol alone cannot bring us salvation from foreign oil unfortunately. So what are we to do? We need a transition.

Meet cellulosic ethanol, the disregarded and seemingly ignored technology by many in the professional world. Cellulosic ethanol lives in the shadow of corn ethanol because of the seemingly disappointing number of gallons that are produced. The original thought a decade ago when policies were launched for biofuel is that cellulosic ethanol would be the largest player in the biofuel market, and corn ethanol would fill any leftover gaps in ethanol production. But

obviously that's not the case ten years later. Right now the goal set in 2007 by Congress of 1 billion gallons of cellulosic ethanol is looking quite dismal, almost entirely because of a lack of policy and subsidies. But in the doubt of meeting our goals in production, cellulosic ethanol is just now beginning to shine.

Cellulosic ethanol was limited in the early 2000's by several technical complications and a lack of funding to what seemed like a dead end biofuel by many professionals. Most of the processes involved with cellulosic ethanol are very similar and produce a chemically identical product with corn ethanol. Fermentation, distillation, and recovery of ethanol are very similar in both. The similarities end at early production processes and ethanol purification. But there is no reason that these challenges can't be overcome, there is just too much disbelief caused by the standout costs and technicalities that the benefits remain in a dense fog.

Now there are several large companies that are interested in cellulosic ethanol and have begun construction of their own facilities, facilities that rid of the challenges that cellulosic ethanol originally presented. Ineos, Poet-DSM Advanced Biofuels, Abengoa Bioenergy, and DuPont are a few that are leading the way. Ineos currently has a facility in Florida that produces 8.5 million gallons from wood chips and other plant scraps. The construction of many other new plants is expected to be completed in 2014. Poet-DSM will have one completed (Project LIBERTY) in Emmetsburg, Iowa, producing between 20-25 million gallons of cellulosic ethanol a year from corn stover, which is leaves, husks, and cobs from corn grain harvest. DuPont's new facility under construction in Nevada, Iowa is expected to produce slightly more ethanol than Poet-DSM per year from corn stover, up to 30 million gallons. The capacity of these plants is quite

promising for a beginning industry, considering that the industry will improve as the cellulosic ethanol industry catches on.

The benefits of cellulosic ethanol serve a number of people related in the industry. When cellulosic ethanol reaches a very high market share, food and livestock feed prices will naturally decline, as less of corn grain crops are used for ethanol. The massive amounts of corn crop residues that were typically tilled for a more desirable seed bed are not there to be tilled, so there is a savings in greenhouse emission from the use of large equipment. There is additional equipment used to package and send the stovers to plants, but the emissions are far less than tilling the ground. Other than corn stovers, ethanol can be produced from wood chips and other woody crops such as willow trees, soybean stubble, ditch grasses, and cheap switch grass. Switch grass can be used in rotation with grain crops to improve soil structure and reduce weed infestation. But why grow it when policies are not there to promote it?

The topic of cellulosic ethanol is becoming more and more popular, mostly because of the benefits. But the public also is not aware of why we are not producing it, and this is where public support is needed to force the creation of such production policies. This technology has the proof of viability, and many key companies are now fully committed to this emerging industry. Advancements are inevitable, and it is key to becoming our petroleum savior.

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