

More and more producers are diversifying to cellulosic ethanol production

# Maximising the value of ethanol

**E**thanol production today is not the same as it was thirty, twenty or even five years ago. While the basics of brewing are the same as they have been for thousands of years – pretreatment, saccharification, fermentation, and separation – specific technologies and improvements have developed to increase production value. Just like any other industry, ethanol producers have had their eyes on growth, efficiency and driving more value from the same process. In my 20 years in the industry, it's always been about doing more with less – getting more out of that same kernel of corn.

We've seen the number of ethanol gallons grow substantially, to over 15 billion gallons of US production each year, and as a result the industry offers arguably the cleanest-burning high octane fuel accessible to drivers worldwide. To implement the growth we've seen in the past few years, it wasn't just business as usual in our industry. Due to great efforts in biology and engineering, coupled with a desire to continue adding value to the process to increase the economic value of each gallon of ethanol vis a vis its blendstock value with gasoline, yields went from 2.70 to 2.90 in twenty years, and nearly every plant has implemented corn oil extraction, pretreatment improvements, and more effective enzymatic solutions.

Even with all of these successes, turning out a high-quality fuel that offers a competitively priced octane

around the globe while significantly helping air quality, the work is not done. At each plant, there is a team of people devoted to producing quality products and coming up with additional ways to add value to the process. Volatility in our industry is the norm, and when margins are great, we ramp up production; but when they're not, that's when the ingenuity of our industry really shines.

This is why it's no surprise that ethanol producers continue to add value to their processes by implementing technology to convert the fibre from the corn kernel they grind everyday into cellulosic biofuel. Not only can a producer increase yield by converting more corn into biofuel, the cellulosic gallons offer a higher value across the country, a lower carbon intensity rating, and additional market opportunities such as in California to meet low carbon goals.

Some US ethanol plants today are already producing cellulosic ethanol from corn kernel fiber, and many more are evaluating whether to diversify into this product. Three key questions that each team should ask are: What is the cost and return? Is it easy to implement? What is the value of cellulosic ethanol?

## What is the cost and return?

Ethanol producers grind corn kernels every day, and the fibre is part of the kernel. Therefore, corn kernel fiber is a zero-cost feedstock when using the same infrastructure. For example, Edeniq has

developed a process for producing cellulosic ethanol in the existing operating train. It's a zero-CAPEX approach that combines enzymes and analytics. Traditionally, returns from process improvements tally many months, if not years. Utilising the existing plant, however, provides for an immediate accretion to value. With a zero CAPEX approach a cellulosic technology can begin paying back in the first month of operation, and can total millions of dollars per year of return to the plant.

## Is it easy to implement?

Yes, and it should be. The first step is understanding how best to configure the cellulosic technology given the subtle nuances that cause each ethanol plant to run slightly differently. The next step is a two-week trial, followed by lab analysis. Within three months of the first discussion, customers typically have all the information needed to make an educated decision about whether to register with the EPA for cellulosic ethanol production. It sounds simple, because it is.

## What is the value of cellulosic ethanol?

Cellulosic gallons receive the higher-value D3 RIN in the US under the Renewable Fuel Standard (RFS). Additionally, value is available through the California LCFS programme, or in a few other states that are developing similar programmes. The per gallon value of cellulosic ethanol is typically two-to-three times

the value of commodity ethanol, and the incremental value is not directly related to commodity ethanol margins. Therefore, in an industry in which volatility is the norm, cellulosic ethanol can be an ingenious hedge.

Edeniq has six customers that are currently receiving D3 RINs and two customers that have completed the LCFS qualification process, with more expected to come online in 2018. These customers are helping ethanol – which is already the cheapest and cleanest high-octane blendstock in the world – become even cleaner.

Many plants are also realising that the improved process of manufacturing cellulosic ethanol has the added benefits of increased starch ethanol and corn oil production. These improvements sit squarely in the sweet spot of the industry's goal to maximise value out of the corn kernel.

## Looking Forward:

Creating additional value to a process by adding cellulosic ethanol production doesn't have to be expensive or difficult, and the opportunity is here and now. And just like ethanol plants have continued to improve their efficiency over the years, the industry can expect more of the same from burgeoning cellulosic ethanol technologies, with even more upcoming opportunities to unlock value from the same kernel of corn. ●

## For more information:

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