First commercial! Construction underway in Minnesota for Green Biologics

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Construction underway. Commercial production in 2016. That's the word from Green Biologics on its first commercial. Here's the skinny and the lowdown.

In Minnesota, construction is now underway at the Green Biologics bio-based n-butanol and acetone manufacturing facility in Little Falls, MN. The existing manufacturing site, formerly known as The Central MN Ethanol Cooperative (CMEC), was acquired by Green Biologics in December 2014 and re-named Central MN Renewables. Commercial production is scheduled to commence in 2016.

Green Biologics' new plant

The timeline

This is bolt-on technology, so right now the plant will be running in full ethanol production mode while the new technology is built and installed on site in Minnesota.

Sometime in early 2016 we can expect the existing plant to shut down while the new technology is tied in to the existing plant — and we can expect that by the end of the year the plant should be in full production of n-butanol and acetone.

The financing

Last January, the company announced the closing of an internal follow-on equity round of $42 million co-led by Swire Pacific Limited and Sofinnova Partners. Existing investors Capricorn Venture Partners, Oxford Capital Partners, Morningside Technology Partners and ConvergInce Holdings also participated in the round.

"The commencement of this construction project marks a significant milestone in our commitment to becoming a world class renewable specialty chemicals company," said Sean Sutcliffe, Chief Executive of Green Biologics, Ltd.

The technology

Leveraging a leadership position in Clostridia microbiology, biochemistry and fermentation, GBL develops microbes and processes that utilize sustainable and diverse feedstocks to produce a portfolio of valuable chemicals and future biofuels. While maximizing performance GBL focuses on minimizing environmental impact.

Clostridia are well suited to commercial use for the production of industrial chemicals. Proven commercially for a century, they are robust, solvent tolerant and can utilize a variety of feedstocks and sugars including C5 and C6 monomers, dimers and some polymers. Most importantly more of the energy provided (in the form of sugars) is recovered in the form of usable products (solvents and energy) than is the case for most commercially utilized organisms, such as yeast.

It's been demonstrated, thankfully, via a modification of Easy Energy Systems's ethanol demonstration plant in Emmetsburg, IA, where the partners produced renewable n-butanol and acetone as far back as 2012 at a 40,000 liter fermentation scale. The scale up here will include larger fermentation units and more of them. And, the company produced 50 tons of product out of China in a demonstration-and-marketing-push, which was sold and sampled.

For those less familiar…

For those less familiar with the 4-carbon butanol (as opposed to 2-carbon ethanol), it's been widely tipped for years to ultimately be the molecule of choice for the US Corn Belt. It's been a much tough technology puzzle — but the business case for producing fuels and chemicals using a four-carbon platform is solid. On the chemicals side, there are a range of $5 per gallon applications, or even higher prices.

Now, to complicate matters just a little, there's isobutanol and n-butanol — the former is better for fuels, the latter is better for chemicals. Gevo and Butamax have been working on isobutanol, and have made substantial progress towards scale — especially Gevo, which is now operating at its first commercial facility in Luverne, Minnesota.

The problems have been two-fold. First, a fermentation process with sufficient yield. Two, a process that can utilize cellulosic material to get the costs down. And with that, along comes Green Biologics and its process.

And, a whole bunch of buzz in the C4 platforms, as companies switch from naphtha to low-cost natgas, and there have been some resultant price spikes in the C4 feedstocks. Last time we asked Green Biologics about the attractions of today's market, they weren't swayed by the exuberance. "Commodity cycles swing. Our job is improve the technology, and develop economic returns we can deliver throughout the cycle. We appreciate the trend but we're not relying on it."

More here than just n-butanol

There are great opportunities in n-butanol. But wait, there's more. To mention a couple of examples, there's the opportunity to couple butanol and acetic acid for butyl acetate, or with acrylic acid for butyl acrylate, and there are Glycol ethers, as well.

Er, what about players on those platforms. Like BASF and Dow for butyl acetate and butyl acrylate. Or, in glycol ethers, what about Lyondell Basell? Unlikely they'll just roll over. But who knows, maybe there some b-harmony here, and a hook-up down the line. At some stage as Green Biologics develops, key companies who have been keeping abreast of their development may want to have a more substantive conversation.

The China option

For a long time, butanol production has been centered in China. And expect that Green Biologics will go that route when the technology is commecially established.

“In China, we’ll focus on both corn cobs and stover,” CEO Sean Sutcliffe told The Digest. “The situation is very different China vs the US. There, our partners will set up the aggregation and harvesting, and have the roots in Jilin province.”

As industry legend Joel Stone told The DIgest, “The challenge in the US is the size of the farms, they’re so big everything is highly mechanized, and uses a single-pass route for the combine harvester. But the farming economics in China is based on much smaller farms, much more manual. So, the logistics are actually easier in terms of adding on cob harvesting. You see similar things in Brazil. There are regions where it is more manual with the smaller plantations. Elsewhere, it’s more of a problem because of going to mechanized. You’ve got to look at each region, and it’s going to be a moving target for a while.”

And also, think sorghum syrup, energy beets, or trucking in other energy crop feedstocks.

More about Green Biologics

We covered the company in this webinar on the C1 and C4 platforms

The Digest’s 2015 5-Minute Guide