

Adding Fuel To The Biodiesel Fire

Innovation Fuels ramps up its New York Harbor biodiesel plant to annually produce 1 million barrels of increasingly in-demand biodiesel comprised of waste-based feedstock, resulting in big gains for both the industry and company.

By Carrie Ellis

In this still somewhat emerging market, biodiesel producers must be aware of a number of potential issues, such as the prospective efficiency of certain kinds of feedstocks, how to best extract the oil needed from these feedstocks, and regulatory quality standards (which include the European EN 14214, plus the ASTM D6751 standard here at home and in Canada), amongst other things.

With an annual capacity of 1 million barrels at its most established biodiesel production site, Innovation Fuels of Newark, NJ, is doing just that. Operating facilities in both the Port of Milwaukee, WI, and New York Harbor, NJ, the company combines a regional focus with global reach. With facilities strategically located near water, it can supply both regional customers and a network of international partners.

Ramping Up Innovation

After discovering a predecessor company called Homeland Energy in 2001, Innovation Fuels CEO John Fox was elbow-deep in developing a biodiesel plant by the end of 2005. Of moving forward with that company, he says, "We decided that there was an opportunity to consolidate the market, and we wanted to be that consolidator. Our company was focused on project development, and we had a lot of expertise in the fuels business, as we worked in compressed natural gas, hydrogen and other types of fuels.

"So we met with Malek Jalal, who was starting Hampton Biofuels. Coming in from the petrochemical side, his company had the same ideas about consolidating the market, so it was a very good match between us. We merged our entities at the beginning of 2007 and then acquired this facility [the New York Harbor site]. In March of this year, we also acquired the Milwaukee site."

Figuring Out How To Best Fuel The Fire

"Back in October when we bought the site, we made an investment of \$7 million. Over that course of time, we shut down the facility to put in all of the necessary processes, such as a pipeline infrastructure. Now we're back online (since June), and we're increasing capacity to meet that 1 million barrel mark.

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“We’re still in the phase of finishing the plant, and getting it operational and up to spec,” Fox continues. “It’s a chemical processing facility, so there are a lot of issues on a day-to-day basis. You don’t want to have any leaks or spills because that’s \$4 a gallon running out the door, and that gets expensive.”

What does the company do to minimize these issues and reduce some of these costs? Eric Lauzon, Innovation Fuels plant manager, has a couple of ideas:

“We constantly recycle. For instance, we use two methanol recovery systems—one for glycerin and one for biodiesel—that allow us to recycle and re-use methanol, so we don’t have to buy as much, which helps us to maintain profitability.

“Furthermore, we look for ways to be more efficient on a daily basis. We’re currently improving our steam system, as we go through a lot of steam, and it gets expensive to heat the water required for steam generation. Insulation is also a big deal; you can really minimize your costs by insulating piping,” he suggests.

Keeping in mind that feedstocks can arrive with varying properties, one challenge that biodiesel producers report is analyzing those properties to come up with the ideal production formula. Lauzon concurs, “The feedstock coming in may have different free fatty acid or water content, and depending on what product it is and where it’s from, it has a different number. So we have to calculate how much reactant and methanol we’re going to add to the process to create product consistency.”

Fox emphasizes the critical point of not only generating consistent product, but also keeping the process as flexible as possible, especially with energy and raw materials prices on the rise. “We might be able to get a poultry fat for less this week, so we do shift inputs frequently when there is a need to tweak things.”

Getting Around Pricing—Food Vs. Waste

In Fox’s opinion, “In the U.S., consumption has been relatively low because most biodiesel producers use soybeans as feedstock, and they’re, in essence, selling biodiesel above market pricing.” With the current condition of the U.S. and world economies, that’s a tough sell.

Innovation, however, has found a way to combat that pricing structure:

“Because we use readily available waste products—mainly animal fats (beef tallow, or poultry and pork fats) or weeds—mostly non-food-based products—we’re able to sell at a discount.

“We do also use some canola oils. We particularly need that in our blend to meet certain cold-flow properties [necessary in New York outdoors fluid control operations]. Although the U.S. doesn’t have any cold-flow standards, Europe requires a specifically -15°C-capable blend during certain months of the year.”

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“Cold-flow properties have more to do with feedstock quality than type,” says Lauzon. “That's why Innovation tests feedstock as it comes in—because not all feedstock is created equal, even if it is the same product (such as beef tallow).”

Quality, Quality, Quality

When it comes to quality, the company's lab takes care of in-house testing. Quality checks along the way include testing the biodiesel while still in the system, before it hits the shore tank if intended for overseas shipping and when it's in the vessel before it's actually sent. The product is also inspected by an independent reference lab before it's distributed.

“We want to come out with an ASTM- or EN-spec product.” Fox says. To that end, a third-party lab must also complete a certificate of analysis at the end of each process. To take it even a step further, however, Innovation invested heavily in obtaining BQ-9000 status (which is similar to an ISO rating).

“We're the only BQ-9000 facility in the Northeast, and some companies will only buy biodiesel from facilities like ours. Therefore, being a BQ-9000 plant has helped tremendously from a marketing standpoint. However, once people have a history with these fuels, validation will be less of an issue,” Fox contests.

To comply with BQ-9000 certification, the company invites an independent auditor to come in to investigate its processes. Lauzon says, “The auditor makes sure we're handling the product the way we say we're handling it, meaning the procedures are being followed from a documentation standpoint. And then they actually interview customers to see if they're satisfied with the product itself.” If an auditor reports poor biodiesel production practices or performance to the committee, however, that facility could lose its license.

“There were some problems a couple years ago in regard to off-spec fuel leaking into the marketplace,” Lauzon recalls. “When that happens, the industry as a whole is blemished. That's one of the biggest issues the National Biodiesel Board is dealing with now, which is why the organization pushes BQ-9000.”

Where Biodiesel Pipes Can Get Tangled

Innovation's water wash was a challenge until the company integrated a dry purification system into its process. The wash (which was the original system when the company bought the facility) cost the company anywhere from 14 to 60 cents per gallon to dispose of, paired with the fact that the company uses water to make the product. All of that water was thrown into a dumpster—too tainted for re-use.

“We quickly decided when we bought the plant that we were going to move to a dry purification system, which was a challenge because it was a new process (as most manufacturers use water washes). However,” Lauzon posits, “I think it'll be the

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single most effective item we've implemented to reduce cost.

"It works like a water softener in that there's resin beads inside a column [which the biodiesel is transported through], and impurities stick to those beads, so you're left with a more purified product. Once the biodiesel flows out, you only have to flush out the impurities with something like methanol, so you can reuse the column."

"Another obstacle we're dealing with right now is readying the plant for the winter—we're heat-tracing a lot of lines and putting insulation in the equipment to ensure we still have the flow we need," admits Lauzon. Both Fox and Lauzon also advise biodiesel producers to keep an eye on water and particulate content levels as the process seems to be prone to these issues as well.

A Business-Savvy View Of Biodiesel Trends

"We're selling right now into the heating oil market in the U.S., but because Europe mandates [buying biodiesel], the margins are significantly higher in Europe than they are here in the U.S." notes Fox. "I think that mandate increases to 10 percent by 2011—it's 5.75 percent right now, and there are incremental increases. In Europe, in the upcoming year, I believe consumption is slated to be closer to 2 billion gallons.

"In contrast, I believe consumption here in the U.S., according to the National Biodiesel Board, was around 600 million gallons last year—or maybe a little less. But next year, the federal government has mandated the blending of biodiesel into transportation fuels, so 650 million gallons of biodiesel is already mandated to be blended in the U.S. next year.

"The tide is definitely changing. I think that's why we're seeing a lot of interest from heating oil providers. Not only are we giving them a discount, but people are also realizing that these mandates are coming, and they want to become more familiar with how to actually blend the biodiesel, and do so on a smaller scale."

Current biodiesel capacity in the U.S. is approximately 2 billion gallons a year, so there's certainly enough capacity. But it's the economic drivers of biodiesel production that Fox believes are holding up widespread adoption. He also thinks, however, that these economic issues will eventually be solved, catalyzing even more implementation in the future. He says, "Right now most biodiesel producers are in the Midwest, and they're all focused on soybean oils. As you know, soybean prices are through the roof, which makes it uneconomical for a biodiesel user to buy biodiesel if using that feedstock. Therefore, those facilities are either shut down or underutilized."

Lauzon continues, "I think the food vs. other feedstock debate is quickly becoming a moot point. Even our customers are beginning to question if we're using sustainable sources or non-food-based oils in our process. So as opposed to just the government driving [the implementation of non-food-based feedstock], it's also our customers and the industry itself."

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Innovation Fuels believes that biodiesel producers need a sustainable system to be able to grow. In order to begin a successful biodiesel business, find a feedstock that's more sustainable, as Innovation has done, avoiding food-based feedstocks while continually striving to improve general processes—it's a decision we can, quite literally, all live with as it supports both business and the environment.

In The Pipeline & Industry

Innovation Fuels doesn't typically invest in research and development projects unless the company is less than two years from achieving some kind of return on investment (ROI). However, it is currently looking into more alternative sources for waste-based feedstock for the biodiesel marketplace. You can check out some of its findings via the company's website—www.innovationfuels.com [1]

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