

# **B P T** biomass

## PRODUCTS & TECHNOLOGY

November 2010

A WoodwardBizMedia Publication

[www.GoBiomass.com](http://www.GoBiomass.com)

### INSIDE:



*Briquette & Pellet Systems*



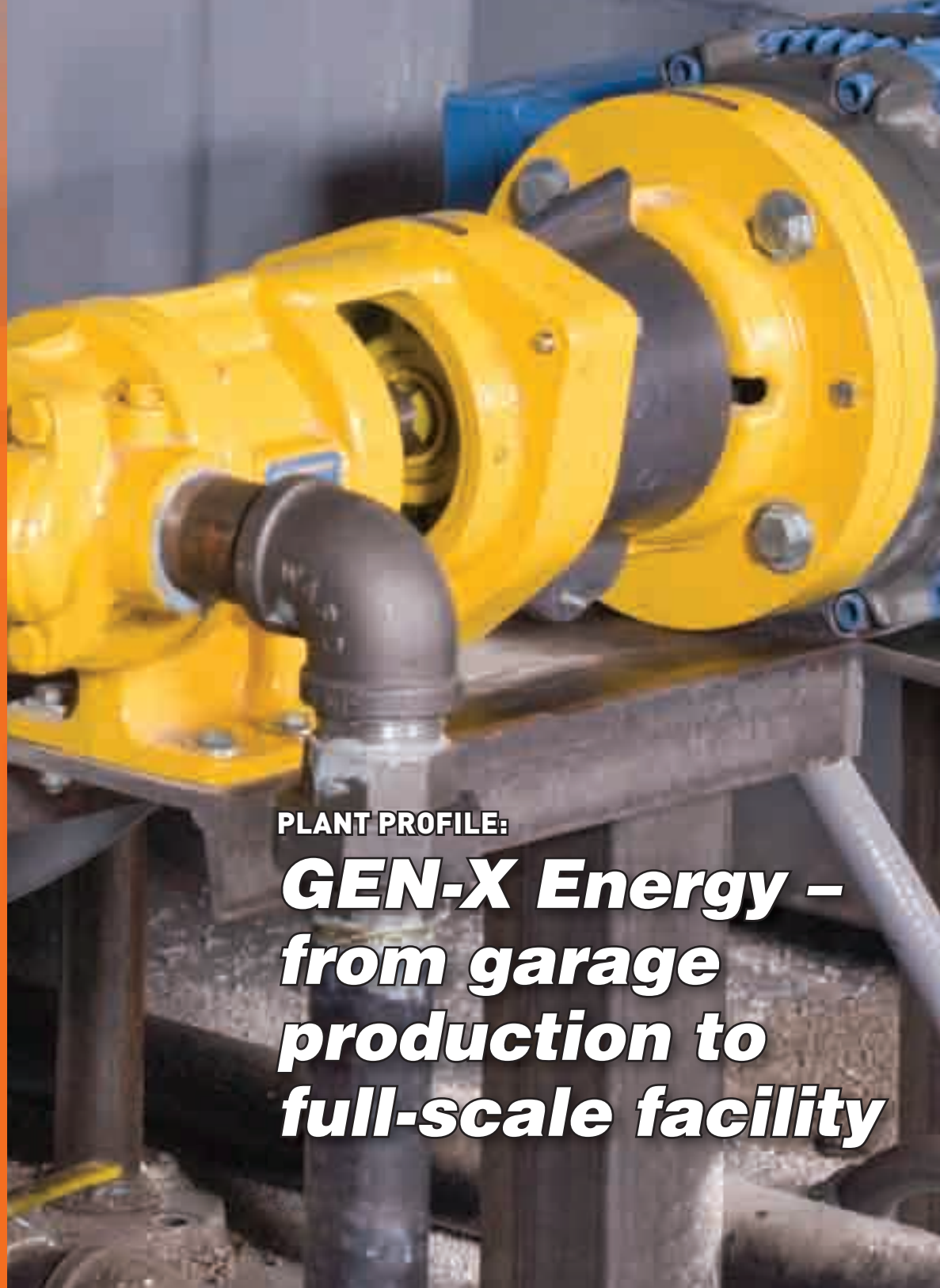
*Level & Flow Control*



*Mixers/Sifters/Filters/Sieves*

### ALSO:

- *Pumps/Nozzles/PVF*
- *Water Treatment & Handling*



### PLANT PROFILE:

***GEN-X Energy –  
from garage  
production to  
full-scale facility***

# Gen-erating momentum



BY TOM STONE

Like many of the other pioneers in the biodiesel industry, Scott Johnson originally began making biodiesel in his garage with some basic equipment and Internet know-how. In 2005, Johnson and his wife, Kathy, were commuting a combined 440 miles per day and facing diesel fuel bills that totaled more than \$900 every month. Out of necessity, Johnson set up a mini biodiesel production facility in his garage and quickly dropped his fuel bills to only \$350 per month.

Even though the savings were beneficial to his family, Johnson still had to endure some skepticism from others in his community.

"I had people laughing at me. The guy that was delivering the methanol to my house was laughing at me, calling me the crazy guy trying to make his own fuel," he said.

However, after friends and neighbors heard how much the Johnsons were saving on their monthly fuel bills, the skepticism quickly turned into intrigue.

"In a short time, I had more and more people ask me if I could make it for them. I have a big shop at home, so I was going to just build a bigger operation there," Johnson said.

"But, one thing led to another and people kept on asking for more and more, so it came to the point where a few of us began discussing a full-fledged biodiesel production facility."

Johnson, along with 4 other owners, sat down during the second half of 2005 and began mapping out their plan for taking what started out as the typical garage biodiesel production operation and turning it into one of the largest biodiesel plants in the state of Washington. Just two short

years after his first batch of biodiesel from his garage, Scott Johnson — now president of GEN-X Energy Group Inc. in Burbank, Wash. — operates a large-scale biodiesel production

plant strategically positioned in the southeastern part of Washington.

GEN-X is permitted for 5 million gallons of biodiesel per year, but on paper Johnson estimates the plant could produce 15 million gallons without any modifications. The plant could easily go to 40 million with a couple more reactors and centrifuges.

---

*As it began production in mid-2007, GEN-X Energy Group has come a long way from a garage-based operation to a well-positioned, full-scale biodiesel production plant.*

---

## Equipment needs

Since this wasn't going to be just another "garage" biodiesel operation, the newly formed company turned to its local equipment distributor, Northwest Pump & Equipment Co. in Spokane, Wash., for advice on the proper equipment needed for each application within the plant. Rick Fuqua, Northwest Pump's resident biodiesel expert, consulted with Johnson and immediately began discussing the company's pump options since pumps are one of the key components within a biodiesel production plant. Fuqua suggested to GEN-X the use of Blackmer ProVane Motor Speed Sliding Vane Pumps for its methanol recovery, caustic (in this case, it's potassium phosphate), Magnesol (for its wash) and multi-oil feedstock-transfer applications. Johnson agreed and installed Blackmer pumps throughout the facility. Since day one, the pumps have been performing problem-free, as expected.

"Blackmer pumps are known for their reliability. You can use them in all different kinds of applications and we certainly do just that in this plant," Johnson said. "Another nice thing about Blackmer pumps is that they will benefit us financially. Since they're simple to work on — it's easy to change the vanes and easy to maintain — we don't have to worry about downtime."

In addition to the Blackmer ProVane pumps, GEN-X also uses the Blackmer XL Series of sliding vane pumps for high-speed truck loading and transfer rate applications throughout the plant. Both the ProVane and XL vane pumps are designed for reliable, continuous duty in biodiesel production operations. The sliding vane technology used by these pumps provides biodiesel producers with superior self-priming and suction capabilities. This suction capability can benefit biodiesel operators by stripping lines of residual product to improve production yields and avoid contamination issues.

The sliding vane technology principles of the ProVane and XL pumps ensure proper sealing and volumetric output performance, even after significant in-service time. This eliminates the efficiency-robbing "slip" that shortens the life of competitive pumping technologies, such as lobe and gear pumps. The ProVane and XL Series both provide smooth, sliding vane action without metal-to-metal contact, which reduces pump friction, eliminates galling and minimizes agitation of fluids.

Introduced by Grand Rapids, Mich.,-based Blackmer in 2005, the ProVane provides added benefits to GEN-X and other biodiesel producers due to its many "designed in" features, such as the hydrodynamic journal bearing — a unique fluid boundary forming principal that eliminates shaft-to-bearing contact. The shaft hydroplanes above the bearing surface on a cushion of liquid. In this hydrodynamic condition there is no metal-to-metal contact or wear, and bearing life can be significantly extended. These pumps are engineered to achieve hydrodynamic mode (full film operation — the point offering the lowest bearing friction and least wear) faster than any other pump in its class to preserve bearing life. It also maintains optimum bearing characteristics, even under a wide range of operating conditions — such as the ones found in the GEN-X biodiesel production plant. Reduced shaft/bearing contact minimizes friction and results in higher mechanical



efficiency and smart energy cost savings.

"I've met with several biodiesel producers over the past few years and all of them are very intrigued by the overall efficiencies and energy cost savings you get from the Blackmer pumps," Northwest Pump's Rick Fuqua said. "When you're in the energy-production business, using equipment that reduces energy consumption is certainly important. The Blackmer sliding vane pumps do just that."

The ProVane offers efficiency at low flow rates and allows higher operating speeds and pressures on low viscosity fluids compared to other types of PD pumps. The ProVane pump also is capable of low-flow, high-head applications on low-viscosity fluids where centrifugal pumps can't run.

"We have plans to build additional plants and, from day one, we'll install all brand-new Blackmer vane pumps," Johnson said.

Besides the typical hiccups that plague nearly every new plant, GEN-X had a promising first few years of operation. In part, their success can be attributed to the proper selection of equipment throughout the plant and Johnson's prior experience in the garage.

## Feedstock partnerships

Today, the GEN-X biodiesel plant is in a great position to be a leading biofuels producer in the northwestern United States. With the Tyson Foods rendering facility located 12 miles down the road, GEN-X has the groundwork in place to acquire enough tallow oil to reach new heights.

"Our feedstock backbone is tallow oil from the Tyson

Foods rendering plant just down the road. They could supply us with between 5 million and 8 million gallons of tallow per year,” Johnson said. “There are also a lot of other oil sources around that could be used for another million gallons per year, but Tyson is a key partner for us moving forward.”

In April 2007, ConocoPhillips and Tyson Foods announced a strategic alliance that would allow the major oil company to use beef, pork and poultry by-product fat (tallow oil) to create a transportation fuel, according to the company’s press release. After that news hit the streets, Johnson and the rest of GEN-X wanted to know what it meant for their long-term plans with the local Tyson plant.

“When the ConocoPhillips/Tyson Foods partnership on tallow was announced, I called my contact at Tyson and asked him about the situation,” Johnson said. “He assured me that it won’t impact our agreement.”

In addition to Tyson, GEN-X is working with farmers and crushers in the area to bring local seed oil into the plant. Johnson also sees a large opportunity to partner with some of the restaurants in the area for used, or second-use oil that would supply about 10,000 gallons per month. Not a significant amount, but Johnson is more than happy to work with anyone with the same mindset.

“Another partner that we’ve signed an agreement with is Westway Feed Products Inc. They are located right next door,” Johnson said as he walked out the back door of the GEN-X facility and pointed to the Westway operation. “They provide feed to livestock industries in the area. Westway can use our

glycerin, which is a byproduct of our biodiesel production process, as a feedsource. Therefore, we are closing that loop between the feed, tallow and biodiesel.”

Many other opportunities will likely be presented to Johnson in the coming years, but GEN-X is certainly positioned correctly for a significant growth spurt in the future.

“All of us are very excited about how far we can take this,” Johnson said. “Fernando Moreno, our vice president, Ray Benavides, our V.P. of Sales & Marketing, Joe Stanton, our director of Plant Operations, Brian Moreno, a stockholder and myself are happy to come to work and finally be doing something that actually helps make a difference.”

---

*Tom Stone is the director of Marketing for Blackmer, based in Grand Rapids, Mich., an operating company within Dover Corporation’s Pump Solutions Group. You may contact him by e-mailing [bpteditorial@woodwardbizmedia.com](mailto:bpteditorial@woodwardbizmedia.com). For more information on Blackmer, visit [www.blackmer.com](http://www.blackmer.com).*

*For more information on GEN-X Energy Group Inc. in Burbank, Wash., visit [www.genxenergies.com](http://www.genxenergies.com).*