



Stahlbush Island Farms

Turning Waste into Revenue

As Stahlbush Island Farms planned the launch of North America's first-of-its-kind Biogas Facility, they recognized that they had an opportunity to make the facility truly unique. Digesters are renewable energy plants that convert waste products – manure or food waste – into electricity through anaerobic digestion. In other words, they turn waste into revenue generating power. In the case of Stahlbush, enough electricity to power 1,100 homes.

But digesters themselves produce a high volume, difficult-to-process waste stream that is normally disposed of by land spreading, in this case up to 40,000 gallons per day. In Oregon, land spreading can take place only during a few dry months out of the year because of concern of run-off and contamination of nearby waterways. The storage and hauling of the constant waste stream is both burdensome and expensive.

But Stahlbush saw this problem as an opportunity. If the waste stream could be concentrated, not only would the hauling and storage issue be minimized and fresh water reclaimed, but the resulting concentrated product would qualify as a high-value organic fertilizer – and could replace the expensive fertilizer that they were already buying to feed their crops.

In other words, the already green technology of their anaerobic digester would instantly become twice as green, and doubly profitable. The idea appealed to Stahlbush both as a commercial business, and a farming operation committed to sustainable farming practices.

Digester waste streams are very high in solids, making traditional separation technologies useless for concentrating the stream. So Stahlbush turned to Hydration Technology Innovations, an Oregon company whose proprietary Forward Osmosis technology has proven itself in other challenging applications such as the concentration of landfill leachate.



De-watering, or concentrating, a digester waste stream is extremely challenging. On the one hand, a concentrated waste stream would be rich in nutrients and have value as an Organic fertilizer. Retaining those nutrients in the concentrate is critical, but requires very tight separation technology. On the other hand, the waste stream is very high in solids and would quickly foul traditional filtration processes that are tight enough to retain the nitrogen, phosphorous, potassium and other desirable components.

HTI's forward osmosis systems are ideally designed for this type of challenge. Instead of hydraulic pressure, the process uses salt brine on one side of a membrane. When the waste stream is introduced on the other side of the membrane, the salt pulls water from the waste stream by osmosis. Because hydraulic pressure is not required, the process is extremely resistant to fouling or clogging. Forward osmosis removes 75-90% of the water from the waste stream, and the membrane is tight enough to retain the nutrients. The diluted salt brine is then re-concentrated using standard Reverse Osmosis technology, recovering the brine for re-use and generating clean water for use in the food plant or disposal.

HTI's Forward Osmosis concentration system is expected to be fully operational by January of 2010. When it is, instead of buying expensive Organic fertilizer, Stahlbush will be making it themselves, transforming what was once problematic waste into a valuable resource and furthering the Stahlbush goal of sustainable farming.