

“If dairy farming on the west coast is to survive, we need to move ahead with projects like this” – Darryl Vander Haak, Owner, Vander Haak Dairy

Lynden, WA – Vehicles fueled straight from the farm – what seems like a far-off vision is not so far-off. Biodigesters have experienced limited payback thus far by selling electricity to the grid. At least that’s what Biomethane, a startup based on the work of WWU Vehicle Research Institute director Eric Leonhardt, found. Depending on local utility rates, biomethane sold at \$3/gallon equivalent has a two-to-five times higher payback than biogas used for electricity generation.

The pilot station, located at 750-cow Vander Haak Dairy in rural Lynden, WA, is fed with biogas by a digester built in 2004, the longest running in the state. It was installed as part of an effort to support the dairy, a family-owned and operated business since 1968.

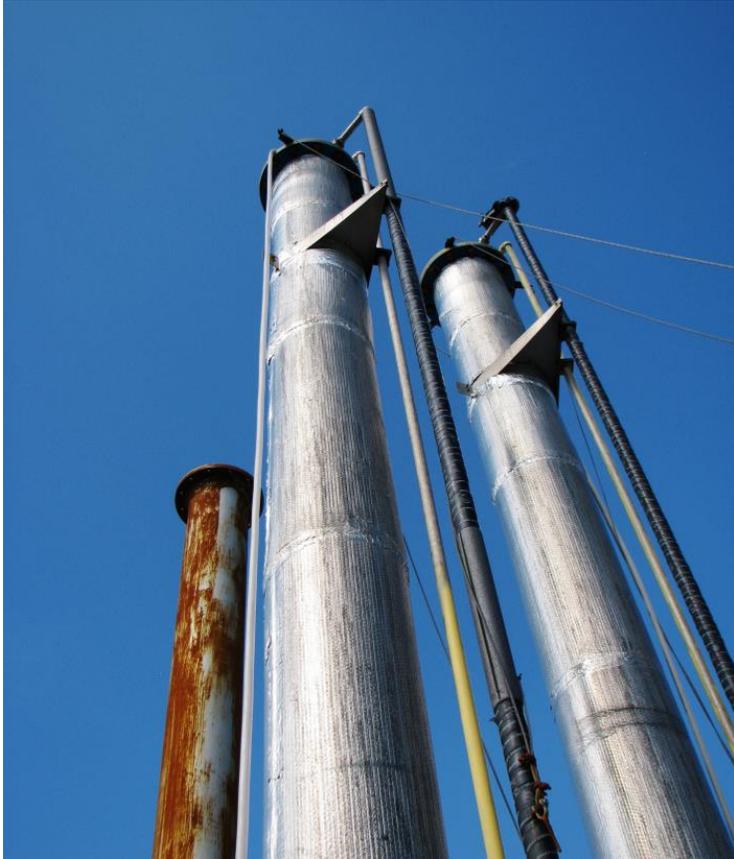
Besides supplying raw biogas, which could be sold at over \$150,000 per year, the digester provides dry bedding for the farm, a savings of \$10,000 per month. “If dairy farming on the west coast is to survive, we need to move ahead with projects like this,” says Darryl Vander Haak, owner of Vander Haak Dairy.

The fueling station sells natural gas fuel to Bellair Airporter Shuttles. Once the station is completed, purified biomethane will power their route between Vancouver, BC, and Seattle, WA.

*Biomethane, a startup founded by WWU graduate Kathlyn Kinney and Vehicle Research Institute director Eric Leonhardt, works with farmers to create carbon-negative fuel from dairy waste.*



*The Vander Haak digester manages waste from 750 dairy cows.*



*Purification towers clean the gas to at or above pipeline standards.*



*A CNG (compressed natural gas) pump fuels vehicles right at the farm.*



*Fueling at the farm: Biomethane from dairy waste is one of the most carbon-negative fuels available.*



*The Bellair Airporter Shuttle runs CNG from the farm between Vancouver, BC, and the SeaTac International Airport.*



*Co-founder Eric Leonhardt stands with the Viking 45, a WWU race car built to run on biomethane.*

Based upon a 1200-cow farm:

#### ELECTRICITY

- 5000 ft<sup>3</sup>/hour = 1,320 kWh, but dependent on generator efficiency.

More realistic = 350 kWh

- 350 kWh @ \$0.08/kWh = \$28/hour
- Dollar earned per day selling energy as electricity = \$672/day

#### TRANSPORTATION FUEL

- 5000 ft<sup>3</sup>/hour = 4.5 million BTU/hour
- 4.5 million BTU/hour / 114,100 BTU/gallon = 39 gallons/hour
- 39 gallons/hour x \$3.15/gallon = \$123/hr
- Dollar earned per day selling energy as transportation fuel = \$2948/day

Source: [www1.eere.energy.gov/cleancities/pdfs/ngv\\_wkshp\\_meyn.pdf](http://www1.eere.energy.gov/cleancities/pdfs/ngv_wkshp_meyn.pdf)