

Walden University Alumni Association Blog

The official blog of the Walden University Alumni Association.

December 08, 2009

Walden Think+Up Case Study: "Cow Power: Creating Natural Gas from Manure"



If someone were to ask, “What are the greatest threats to the environment today?” most people would answer “gas-guzzling cars” or “smoke-spewing manufacturing plants.” Yet surprisingly, cows are responsible for 18% of the greenhouse gases that cause global warming—more than cars, planes, and all other forms of transportation put together, according to a United Nations report. What’s worse, the [Environmental Protection Agency \(EPA\)](#) reports that in the U.S. alone, cattle emit about 5.5 million metric tons of the powerful greenhouse gas, methane, per year into the atmosphere—20% of U.S. methane emissions.

Fortunately, a growing number of dairy farmers are discovering a unique way to curb their cattle’s environmental impact while converting cow manure into a renewable source of energy. Better yet, by forming key partnerships with public utilities, these farmers are tapping into a potentially lucrative business opportunity—provided they can work within stringent government regulations and raise the necessary start-up funding.

A meaningful partnership

Just ask David Albers. A third-generation California dairy farmer and environmental attorney, Albers owns the first dairy farm in California to deliver pipeline-quality, renewable natural gas to utility giant [Pacific Gas and Electric Company \(PG&E\)](#). Here’s how the system works: Manure is collected in a holding area on Albers’ farm which is sealed to create an oxygen-free atmosphere. As this manure decomposes, microbes break down the compounds and produce methane gas. Pumps draw the biogas from beneath the lagoon covers and blowers push the biogas through an underground pipeline. Finally, PG&E collects this biogas and scrubs it to create renewable natural gas that can be used to produce electricity.

Moooooo-re money, fewer emissions

Albers has been piping gas to PG&E since October 2008—about 200,000 cubic feet per day—which is enough to power 1,700 homes. While it’s not unheard of for dairy farmers to install biogas recovery systems to power their own farm operations, teaming up with a utility such as PG&E heralds a new direction in biogas usage as well as dairy farm revenue.

“We are paid a substantial premium for our renewable gas so it’s much more advantageous for us to sell it to a company that’s willing to pay us that premium than it is for us to use it to run our own operation,” says Albers.

But that’s not all. Albers’ 2,600 Holstein cows produce emissions that are more damaging to the planet than carbon dioxide. However, by capturing the emissions using a methane digester, he achieves a significant emissions reduction. In

fact, a recent report from the University of Texas, Austin, estimates that using the approximately one billion tonnes of manure produced annually from the livestock industry in the United States to generate electricity could supply up to 3% of total U.S. electric demand. In turn, 99 million tonnes of net greenhouse gas emissions could be eliminated.

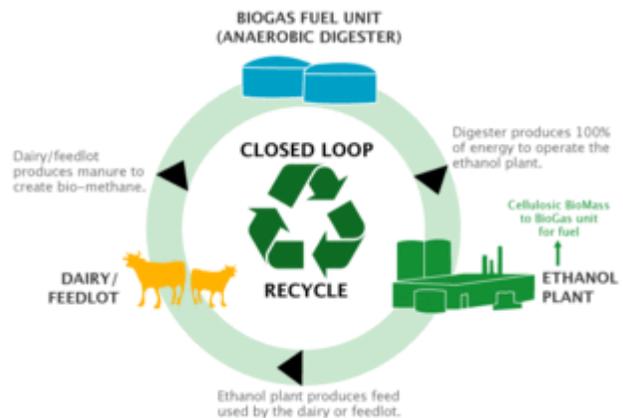
“If not for the digester, that manure would still break down and all that gassing off would go into the atmosphere,” says Albers. “We’re capturing all of that now and either destroying it or putting it in the pipeline.”

Allen Dusault recognizes both the environmental and business value in converting cow manure to biogas through public-private partnerships. Dusault is the director of sustainable agriculture at the San Francisco-based [Sustainable Conservation](#). By partnering with the privately-owned Hilarides Dairy in Lindsay, Calif., Sustainable Conservation helped turn two diesel-powered trucks into vehicles that can run on biomethane produced from cow manure.

“The vast majority of dairies in California and some other states produce a lot of methane from decomposing cow manure. Being able to capture that gas reduces the impact of methane, which is 21 times more powerful [as a greenhouse gas] than carbon dioxide,” says Dusault. Not to mention the added business opportunities it creates for countless industries, he adds.

Biogas beyond borders

Currently, Albers is working hard to create a biogas network of dairies, each responsible for running methane digesters and linking to an expanding pipeline system. To date, Albers says 39 dairies have agreed to collaborate with him on the system. And long-term goals might even include replicating the system in developing nations where biogas has huge potential. In Nepal, for example, nearly 80% of the population lives in rural areas with no electricity. Over the past two decades, [Biogas Sector Partnership-Nepal \(BSP\)](#), a non-governmental agency, has installed around 210,000 biogas plants that use cattle manure to provide biogas for cooking and lighting. According to BSP, each plant reduces the country’s carbon emissions by around 4.7 tonnes a year.



“There are a lot of opportunities globally for biogas,” says Albers. “We get calls from all over the world.”

What’s more, converting cow manure into renewable energy reduces the transmission of disease, especially in countries known for their poor sanitation. “One of the benefits of installing methane digesters in developing countries is pathogen reduction,” says Dusault. “E.coli and other pathogens in animal and human waste that get into the food chain are a real problem.”

Obstacles ahead

For all its benefits and business opportunities, there’s nothing easy about getting a biogas system off the ground—with or without the help of a deep-pocketed utility company. For starters, a methane digester can cost upward of \$3 million, an elusive amount of money for most dairy farmers. Moreover, a tough economy has made it difficult for many farmers to corral the necessary funding for eco-friendly projects.

“We got a very warm reception [from investors], but what we found out is that, in 2009, everybody decided that they weren’t going to invest in anything,” says Albers. “That has really hurt us.”

But that’s not all. Complicating matters further is the fact that there are a whole host of federal and state regulations

governing the design and operation of biogas systems. These days, dairy farmers must be prepared to contend with soil erosion regulations, air quality stipulations, complicated permit application processes, on-going planning and reporting requirements, costly legal fees—even odor complaints from disgruntled neighbors.

Fortunately, there are some regulations working in farmers' favor. Currently, 31 states have enacted Renewable Portfolio Standard (RPS) programs requiring that a certain percentage of a public utility's electricity come from a renewable energy source. As a result, utilities such as PG&E are now looking to join forces with providers of renewable resources. Dairy farmers operating methane digesters may fit the bill.

Without a doubt, cow manure strikes most people as an unlikely fuel for the future. But by forming key private-public partnerships and satisfying stringent government regulations, today's dairy farmers are finding out that the answer to global warming—and increased farm revenues—may just be blowing in the wind.

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Posted by Shannon Mouton on December 08, 2009 at 02:00 PM in [Business](#), [community](#), [economy](#), [energy](#), [environment](#), [farm](#), [global warming](#), [government](#), [International](#), [network](#), [Research](#), [Think+Up](#), [Web/Tech](#) | [Permalink](#)
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