HOARD'S DAIRYMAN
The National Dairy Farm Magazine

November 2011

Game-changing digester models unlock potential

by Jerry Bingold

METHANE digester systems produce clean, renewable energy for dairy farms and local communities. They also help producers employ good manure management practices that reduce odor and control potential groundwater issues. However, as dairy producers have implemented this technology, some have found that the capital investment, operating cost, and financial risk are not supported by the current market conditions and energy policies.

As part of the Innovation Center for U.S. Dairy's sustainability initiative, the Dairy Power project has helped create market conditions that make digester systems a more profitable business venture for dairy producers. The team has set a goal to put digesters on 1,300 dairy farms by 2020. Our work includes identifying and addressing barriers, developing case studies, and advancing alternative business models for digesters.

Lessons from wind and solar

Financing digester systems on dairy farms traditionally has required owners to provide a personal loan guarantee. This has included the owner's land and other business assets. Now, just as they have done with wind and solar power, third-party entities want to build, own, and operate digester systems on dairy operations.

In this "project finance" model, the producer no longer bears the burden of securing financing, operating the digester, and selling the energy to utility companies. Instead, a third-party developer handles all these tasks. This arrangement creates business value for the farm through leasing land for the digester and helping reduce costs for manure management, bedding, and fertilizer. The producer also receives a share of revenue produced by electricity or biogas sales and other marketable by-products such as fiber, carbon offsets, and renewable energy credits.

There are three key components to these business models:

1. An agreement to supply manure and co-substrates.

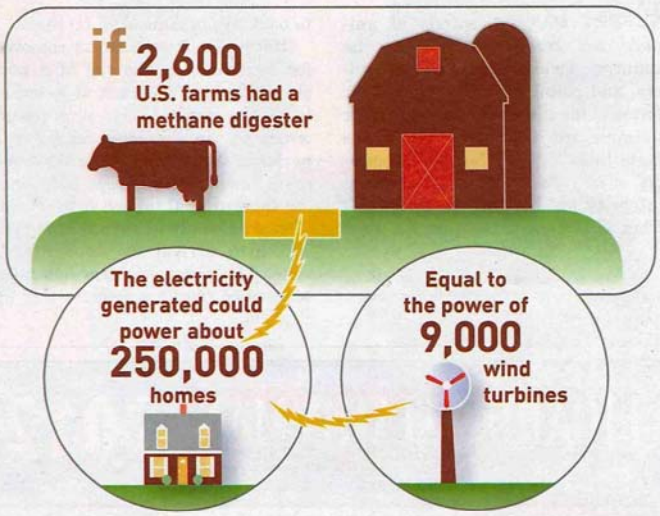
2. Performance guarantees from the digester operator and manufacturer that the digester will work as designed. If it doesn't work, the operator or manufacturer carries the risk.

3. And, most important, what's known as an "off-take agreement." It is a contract with a purchaser of digester products (energy, fiber, nutrients) to ensure there is sufficient revenue to pay the loan and provide a return to the equity investors. Off-take agreements with credit worthy companies provide added assurance that sufficient revenue will exist to pay debt service. In the project finance model, the project developer secures the agreements and takes on the risk — not the dairy farm.

When these three conditions exist, banks and other lenders are interested in dairy digester projects. Then, the project can qualify for attractive project financing terms and conditions. This model helped bring wind and solar markets up to scale, and the Dairy Power team believes it can do the same for dairy digesters.

While there are many examples of digesters on larger farms, smaller operations also can participate in the project finance model through "community clusters."

Three farms in Dane County are participating in Wisconsin's first community or "cluster" manure-digester project. The county launched the project in 2010 under a "Clean Energy and Clean Lakes Resolution."



Wisconsin-based biogas energy developer Clear Horizons LLC built, owns, and operates the project. A total of 2,500 cows are supplying the manure which is converted into methane-rich biogas.

In addition to renewable energy production, Dane County's initiative is the first U.S. community digester specifically built to help producers reduce nutrient runoff into surrounding freshwater bodies. (The older Tillamook, Ore., community digester was established for the Tillamook river and the saltwater Bay of Tillamook.) Dane County's digester removes much of the phosphorus from livestock waste which had been linked to algae overgrowth in the Lake Mendota watershed.

Adding organic substrates

Collaborative agreements with companies that contribute organic substrates to the digester are another positive change that is contributing to profitability. Major retailers and fast-food chains, for example, are considering digester projects because they help meet corporate goals related to environmental stewardship and waste reduction.

When organic substrates (including expired produce or organic by-products from cheese and beer production) are added to a digester, methane production rises by as much as 300 percent.

This additional biogas production adds significantly to project net revenue which the project developer shares with the farm. Those providing organic waste benefit from improved waste management, potential for reduced disposal costs, and a demonstrated commitment to corporate sustainability goals. This also bolsters stockholder confidence. Providers also have the option to purchase environmental attributes, such as carbon credits or renewable energy credits.

The author is director of renewable energy for the Innovation Center for U.S. Dairy.

For internal use only. Reprints available for purchase.