Methane Digesters

In a Nutshell

Methane digesters take waste material (old-food, animal, and human waste) and extract methane. The methane can then be used to produce energy. Some methane digesters will turn the manure into animal bedding and other useable products. This tool can be very valuable to dairy farmers.

The “How To”

According to the Minnesota Department of Agriculture, methane digesters, also known as anaerobic digesters, "collect manure and convert the energy stored in its organic matter into methane, which is used to produce energy... The conversion to methane is the result of anaerobic digestion- a biochemical process in which organic matter is decomposed by bacteria in the absence of oxygen." *****

Methane digesters have numerous benefits, including producing renewable energy. They also improve air quality by reducing greenhouse gas emissions and odors from the manure. Methane digester owners can sell the energy generated and qualify for carbon credit paymers. The leftover manure is actually a better fertilizer for crops, and the manure can even be further processed into bedding for farm animials.

A feasibility study must be completed in order to identify a source and likely the quantity of inputs, anticipated volume of outputs, electric buy back rates, and end users for liquid and solid materials, nutrients, and liquefied petrolium (LP) gas. The study will identify which components of the system are feasible and which are not. A design phase would be the next step, followed by financing, construction, and operation.

USDA Natural Resources Conservation Service would be the government authority on this subject matter.

Planning & Zoning

As methane digesters are generally sited in rural agricultural areas, and they reduce nutrient runoff and livestock odor, there are generally few planning and/or zoning requirements. Any issues would be identified within the feasibility study phase.

Dollars & Cents

There are far too many variables to provide a general economic summary. Electric buy-back rates in the mid-west are relatively low, and therefore other sources of income, such as tipping fees associated with co-substrates, or local use of the liquefied petroleum (LP) gas (vehicle fleets) is critical to making a methane digester feasible. While methane digesters are generally associated with animals, and specifically animal waste, they can also be successfully implemented in other industries where there is a large volume of waste.

Here are the names of a few companies that sell methane digesters. Please contact them for further information about purchasing a methane digester: Valley Air 2020, and SEaB Energy.

For those of you who are the do-it-yourself type, The Urban Farm Guys have an instructional video on how to make our own methane digester. Their digester is designed to handle manure generated by an individual and not a farm animal.

Measuring Success

Methane digesters will contribute to two of the OneSTL performance measures. The first is air quality, which wis measured by number of days the EPA Air Quality Index exceeds 100 for ozone and particulate matter. The desired trend is for the number of days to drop. The 2010 baseline is 19 days.

Another meaure is the greenhouse gas emissions for the region, measured by the total carbon dioxide equivalent emissions per capita. The 2010 baseline was 21.10 mtC02e, and the desired trend is for this number to go down.

Discover More

Purdue University: Basics of Energy Production through Anaerobic Digestion of Livestock Manure

Midwest Rural Energy Council

Case Studies

Anaerobic Digester at Craven Farms

Contact

Oregon Office of Energy

Description

For more information about this project, click here.

Cost $0

Lessons Learned

http://www.renewwisconsin.org/biogas/AD/Craven%20Farms%20Digester.pdf

Anaerobic Digestion at Morrisville State College

Contact

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Description

To learn more about this project, click here.

Cost $0

Lessons Learned

https://www.morrisville.edu/arnold-r-fisher-dairy-complex

Scenic View Dairy

Contact

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Description

The Scenic View Dairy is a dairy farm in Fennville, MI, that houses approximately 2200 head of cattle. Prior to the installation of the anaerobic digester, Scenic View utilized sand for animal bedding which has now been 100% replaced by the separated digested biofibers which is 99.9% sanitized and virtually odor free. The methane produced from this system is also of excellent quality (60%) that is utilized in eclectic generators for one-farm use as well as sold to the power grid for the use of the community. This farm will be the first in the world to combine electricity generation with biogas upgrading to pipeline standards, providing a second option for revenue optimization. The reduction in methane emissions resulting from the digestion process, as well as emission offsets for the replacement of fossil fuels, will be converted to carbon equivalents, and traded on the Chicago Climate Exchange for additional revenue.

Cost $0