



Switch Reliable Energy from Renewable Sources

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Biomass Energy and Waste Management

Farmers operating confined animal feeding operations (CAFOs) have a major challenge in dealing with the large quantities of manure produced by the livestock they raise. Manure makes an excellent fertilizer, but it is expensive to transport. For this reason, it is often applied to cropland near the CAFO. However, if more fertilizer is applied than can be absorbed by the soil and crops, the fertilizer can contaminate surface water such as streams and lakes. The nutrients in the fertilizer cause growths of algae that kill fish and damage aquatic habitats.

Contamination from manure and fertilizer is a major problem in the Mid-Atlantic States that are part of the Chesapeake Bay watershed. The watershed includes portions of Virginia, West Virginia, Maryland, the District of Columbia, Delaware, Pennsylvania, and New York. In this region, there are a lot of CAFOs, a relatively small amount of cropland on which to spread the resulting manure, and a very important fishery in the Chesapeake Bay. Contamination from manure caused a steep decline in the health and productivity of the Chesapeake Bay fishery. This was not only an environmental problem, but also created economic problems as the fishing and crabbing industries were negatively affected. The decline of the Chesapeake Bay led to legislation and environmental standards governing the use and disposal of manure. Although the Chesapeake Bay has recovered somewhat due to these laws and standards, they increase the costs of farming for livestock producers.

There are many different methods available for reducing manure contamination. These include transporting the manure to areas outside of the watershed, storage in lined tanks or ponds, and changing the feed given to livestock. Another method is Biomass energy. There are two different ways in which manure can be managed to reduce pollution and create energy.

The first is direct burning of dry manure. This can be done with chicken litter, depending on the moisture content of the chicken litter. The combustion of the chicken litter powers a generator which makes electricity. It can also be used to make steam and provide heat for the CAFO at the same time electricity is produced.

The other means of reducing pollution and making energy is through a Biogas system. The manure is fed into what is called a digester. The digester uses bacteria to break down manure into methane, which is a very good fuel. The methane powers a generator to make electricity. It can also be used to make hot water for agricultural or industrial use. At the end of this process, there are two byproducts, both of which have economic value. One is a dry material made of plant fiber that makes very good animal bedding or potting soil. The other is a very effective liquid fertilizer that has no weed seeds or fiber.



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Biogas systems work well for controlling odor, flies, ammonia, water pollution, and other environmental problems associated with livestock. Biogas systems get best results on farms or farm collectives that regularly collect manure and have at least 300 cattle or 1,000 swine.

The greatest advantage of converting manure into energy is the manure can provide an additional stream of value added revenue and/or reduce the energy costs of a farm or CAFO. Although biogas and biomass systems will not work for everyone, they are an option to consider for dealing with pollution in the agricultural industry.