

Report

**Community
Manure
Management
Feasibility Study**

Dane County, WI

February 2008

Report for
Dane County, Wisconsin

Community Manure Management
Feasibility Study

Prepared by:

STRAND ASSOCIATES, INC.®
910 West Wingra Drive
Madison, WI 53715
www.strand.com

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SECTION 7
ALTERNATIVE BUSINESS STRUCTURES AND OWNERSHIP

The discussion in this section is focused on the ownership and potential business structure of a community or joint/cluster manure management facility. However, several of the potential ownership alternatives are applicable to single-farm installations of manure management equipment and systems.

7.01 INTRODUCTION

Implementation of a manure management technology at a single farm or on a community/cluster basis is an added load on the farmers' already limited resources. Some of the challenges with respect to these systems include the following:

- The operations and maintenance requirements are above and beyond normal farming operations.
- The operational and technical skills may require special training and possibly the addition of operations staff.
- The business management requirements may require the establishment of a separate entity, depending on the number of farms involved and the technology employed.

The business model required to own and operate a manure management facility could take one of several forms, and these are discussed below. Table 7.01-1 presents a summary of these types of ownership, including advantages and disadvantages of each.

7.02 INDIVIDUAL FARM OWNERSHIP

Most of the manure management applications that have been implemented to date have been at individual farms and include solids and sand separation and/or anaerobic digestion. The significant majority of these installations have been owned by the farm at which the technology is employed, while a much lower number have been owned and operated by third parties as discussed below.

The farm-ownership model works very well for single-farm applications, especially if the technology being employed is fairly low maintenance and does not require a great deal of specialized operator training and certifications. For the cluster applications, ownership by an individual farm may be considered if one of the farms wishes to assume that role and responsibility.

7.03 COOPERATIVE OWNERSHIP

Dairy farmers have a long history of successful cooperatives (co-ops) for the milk production side of the business, and a similar co-op model may work well for managing manure from multiple farms on a cluster basis. The manure management operation would be owned and controlled entirely by the farms in the cluster co-op. The co-op farmers would supply feedstock (manure) to the facility and, depending on the technology employed, may also take back a portion of end-products from the operation. For example, if the cluster co-op installed a digester and solids separation equipment, the co-op farmers would likely take back the liquid fraction of the digested manure for irrigation and fertilizer value.

TABLE 7.01-1
COMPARISON OF OWNERSHIP ALTERNATIVES

Ownership Type	Advantages	Disadvantages
Farmer-Owned: Single or Cooperative	<ul style="list-style-type: none"> ▪ Better input to serve farmers' needs. ▪ Decisions made to benefit the farm as a whole, not just the bottom line of the manure management business. ▪ Many milk producers are very familiar with the co-op approach. ▪ If manure management costs are reduced, farmers realize benefits directly. 	<ul style="list-style-type: none"> ▪ Added operational and maintenance labor and costs. ▪ Not a core part of most farming operations. ▪ Requires varying levels of specialized technical skills.
Third-Party Technology Company	<ul style="list-style-type: none"> ▪ Very good knowledge of the treatment system. ▪ Potentially better able to make operational adjustments to improve treatment processes. ▪ Less of a risk for a large company. ▪ Farmers can focus on core farming business. 	<ul style="list-style-type: none"> ▪ Farmers would have less control of byproducts returning to their land. ▪ Decisions may not be made with the entire farm operation taken into consideration. ▪ If manure management costs are reduced, farmers may not realize the full benefit.
Third-Party Power Utility	<ul style="list-style-type: none"> ▪ If energy production is included, good knowledge of this market and of energy generation. ▪ Typically large companies with better access to capital for significant projects. ▪ Less of a risk for a large company. ▪ Farmers can focus on core farming business. 	<ul style="list-style-type: none"> ▪ Farmers would have less control of byproducts returning to their land. ▪ Decisions may not be made with the entire farm operation taken into consideration. ▪ If manure management costs are reduced, farmers may not realize the full benefit.

Ownership Type	Advantages	Disadvantages
Third-Party Private Investment	<ul style="list-style-type: none"> ▪ Potentially better access to capital for significant projects. ▪ Less of a risk for a large company. ▪ Farmers can focus on core farming business. 	<ul style="list-style-type: none"> ▪ This type of manure management business may not be a core business of the third-party investor. ▪ Farmers would have less control of end-products returning to their land. ▪ Decisions may not be made with the entire farm operation taken into consideration. ▪ If manure management costs are reduced, farmers may not realize the full benefit.
Combination Co-op/Third Party	<ul style="list-style-type: none"> ▪ Better input to serve farmers' needs. ▪ Decisions could be made to benefit the farm as a whole, not just the bottom line of the manure management business. ▪ Many milk producers are very familiar with the co-op approach. ▪ If manure management costs are reduced, farmers may realize benefits directly. ▪ If established properly, could result in a good match of risk and reward for the farmers and the third party. 	<ul style="list-style-type: none"> ▪ Probably the most complex form of ownership.
Government	<ul style="list-style-type: none"> ▪ Increased scrutiny for design elements, financing, and operations may improve chance of success. ▪ Other similar models have been successful: MMSD, Dane County Landfill, Dane County yard material composting operations. ▪ Easier to obtain DNR and other regulatory permits. ▪ Can accept manure from any farm located within the jurisdiction of the governing entity. 	<ul style="list-style-type: none"> ▪ Farmers would have less control of end-products returning to their land. ▪ Capital and operating costs may be higher to meet higher standards. ▪ If manure management costs are reduced, farmers may not realize the full benefit.

However, as another example, if the technology employed was drying followed by manure combustion, there may be no end-products taken back to the individual co-op farms.

As a closed cooperative, outside investors could not invest in the project. However, the co-op could consider accepting manure from farmers outside of the co-op and/or other feedstocks from industrial and commercial sources. This would benefit the co-op by providing an additional revenue stream and, in the case of an anaerobic digestion facility, could improve the biogas production and electrical generation output, which would improve the financial viability of the project.

7.04 THIRD-PARTY OWNERSHIP

This type of ownership arrangement involves investment, and therefore ownership, from persons or corporations outside the farm cluster. The farmers' involvement is normally limited to delivering manure to the facility at an agreeable price. In addition, depending on the location of the facility and the type of technology employed, the farmer may purchase heat, electricity, or other byproducts from the owner.

This option can be attractive to farmers because it can lower their manure management and disposal costs and simplify their farming operations. In addition, operations, maintenance, permitting, and regulatory matters would typically be handled by the third-party owner.

Three types of investor entities are likely the most common and are discussed below.

A. Technology Company Ownership

This type of investment comes from the developers and/or vendors of treatment and/or management equipment and technologies. As such, the owner has intimate knowledge of the equipment and operation of the system. The system developer often provides turn-key design and construction services for the project and has complete ownership of the facility. Operational expertise is normally provided by the developer as well.

This type of project development has been used successfully for industrial wastewater treatment projects for several years and has also been successfully used at the farm-scale for anaerobic digestion of manure for energy generation.

B. Power Utility Ownership

Many power utilities are developing and/or making significant investments in renewable energy programs. In Wisconsin and elsewhere, utilities have invested in on-farm anaerobic digestion systems for manure treatment and electrical generation. Several years ago, it appeared to be more common for the utilities to actually invest in the projects. In particular, several projects were implemented in which the utility financed and owned the electrical generation component of the overall system and purchased the biogas from the farmer-owned anaerobic digester. In more recent years, the trend appears to be moving away from utility ownership of these facilities and more toward assisting owners and project developers in financing such projects and purchasing renewable energy credits from the owner.

However, given the interest in Dane County for sustainable design, renewable energy, and related topics, as well as the interest and involvement in this project from the two local utilities, we believe ownership by one or both of the local utilities may be a viable option and should be considered.

C. Private Investment Organization

This type of ownership would likely be through a diversified investment company. The manure management facility would be owned by a separate company that may have no ties to the area or to farming in Dane County. The farmers would likely have little control over the operation of the facilities.

This type of ownership arrangement is not common at the present time. However, with the development of new technologies, the development of carbon markets, and the realization of their value, investment into this type of company is likely to be more common in the future.

7.05 COMBINATION CO-OP/THIRD PARTY OWNERSHIP

The option would include a farmer co-op arrangement made up of various farmers and other feedstock suppliers as well as nonfarmer investors. The farmer co-op would contribute a portion of the investment; all remaining capital would come from individual nonco-op investors.

This type of arrangement probably provides the best flexibility in terms of financing, business operations, and related issues. However, it may also be the most complex ownership arrangement, and significant effort would be required to develop an effective and equitable model.

7.06 GOVERNMENT OWNERSHIP

There have been a few cases in the United States in which a government entity has constructed a manure management facility and operates the system on an ongoing basis. The following paragraphs discuss two of these systems.

The Port of Tillamook Bay in Oregon constructed, owns, and operates a centralized anaerobic digester to biologically process the manure from about 4,000 of the county's 30,000 dairy cows. The project was developed over 14 years and was built in 2003. The manure processing facility includes anaerobic digestion, solids separation, and biogas-to-electricity generation. Manure is transported to the facility by Port employees, and liquid end-products are transported back to the farmers' field and land-applied. The facility produces electricity, and separated fiber is recovered for use by a potting soil manufacturer. The Port plans to construct additional facilities to serve other farms in the county if the current system proves financially viable and profitable.

In 2007, the Cayuga County Soil and Water Conservation District in Auburn, New York, is constructing a community digester facility to address concerns of manure-related odors and to improve the water quality in Cayuga County. The Cayuga Regional Digester first phase construction program will process approximately 39,000 gpd of dairy manure using anaerobic digestion and solids separation (screw press). Approximately 34,000 gpd of liquid end-products will be land-applied and 25 tons/day of solids will be composted. The facility has contracts to accept and process manure from several farms in the area and is also pursuing additional food processing waste materials that could be fed to the system to

generate additional electricity. The District plans to use a contract transportation company to haul manure from each farm and return processed liquid end-products to those same farms. The initial Phase 1 facility has an electrical generation capacity of approximately 625 kW with future generation potential of nearly 2,000 kW.

While governmental ownership of manure management facilities is not common in the United States, the potential does exist for such a government-owned facility. Dane County would be one governmental agency that may be suited for such an operation. The County already operates similar facilities that manage solid wastes and is routinely engaged with the farming community. The facility model could be similar to that currently employed by the Dane County landfill and yard material composting sites. A tipping fee or similar fee structure would be established for accepting manure, and farmers would be allowed to deliver manure based on an allocation model that would need to be developed. In addition, the byproducts from the manure processing could be sold back to the farmers as appropriate or to other markets.

Another potential agency is the Madison Metropolitan Sewerage District (MMSD) or similar manure management district. MMSD has recently indicated that they do not intend to become engaged in manure management, and therefore, they are not a likely candidate at this time. However, using the MMSD model and establishing a new manure management district may be an option. This body would function similar to sanitary districts and could have similar political and taxing authority.