

Northeast Colorado RC&D

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Determining Feasibility of a Centralized Hog Waste Digester near Haxtun, CO

(This project was completed on 11/1/2010)

Abstract:

The objective of this study was to examine the feasibility of developing a regional anaerobic digester near Haxtun, Colorado to serve three significant hog feeding operations that supply Murphy-Brown, LLC, to utilize their manure to produce renewable energy and organic fertilizer. The digester would provide the collective operators with a waste management and renewable energy facility that can maintain itself financially, provide a consistent revenue stream, and provide primary and secondary rural employment. In addition to making a contribution to renewable energy, the anaerobic digester also would make a contribution to the low-carbon economy through sustainable waste management, reduction of the uncontrolled emissions of methane, and through nutrient recycling via the replacement of fossil-fuel based fertilizers.

Project Description:

The purpose of this project was to investigate the feasibility of developing the first waste-to-energy facility in Northeastern Colorado in order to reduce the carbon impacts, water pollution impacts, energy costs, and waste disposal costs of agribusiness in Logan County. There is a need for the farm economy of Logan County to prepare for climate change legislation and to assure that the impacts of such legislation, as well as increasing fossil fuel energy prices and increasingly strict water quality regulations, have a positive rather than a negative impact on agribusiness in the community. This proposal fulfills an urgent need to move a project forward in the best possible location and with the optimum project partners, infrastructure, and logistics in order to make a collaborative anaerobic digester project a reality for Northeastern Colorado. The project is important to the New Energy Economy of Colorado and to the economic growth and development of Logan County and Northeastern Colorado. It is believed that as many as 100 new jobs may be created during the construction period, with a number of those continuing into the operations phase as a result of this project. In addition, significant greenhouse gas reductions, improved water quality, organic fertilizer production, and renewable energy production and use are possible as a result of this project.

Conclusions:

It is a key finding of this report that a partnership with the producers, and using their equipment and land to handle solids and liquids and recover their nutrients to extract greatest value, will greatly increase chances of project success.

The following will require further investigation and action in order to pursue a commercial project:

- Manure transportation costs.
- Effluent treatment/land application costs.
 - Dryland application through a sprayer.
 - Pivot application would need other farmers.
 - Wetlands project may mitigate costs.
- Well permitting issues and other permitting.
- Composting costs and logistics.
- Need to add costs of hopper and grinder for pig mortality and conduct further diligence.
- Low electricity revenues need to be mitigated.
- Interest expense is prohibitive; need a \$3MM to \$3.8MM in grants to be feasible.
- Need to identify \$425K to \$1.3MM equity financing.

Recommended Next Steps

Next steps to be taken based on findings and recommendations from completion of the project include:

- Detailed study of dryland application of effluent, pivot irrigation, or possible wetlands project on Tom Bornhoft II's land. Included in this should be investigation of whether existing lagoons on each farm could be used for liquid effluent storage, which would reduce the excavation and other lagoon construction costs included in the modeling for this report.
- Investigation of windrow composting and sale of the organic residuals.
- Permitting requirements definition.
- Negotiation with HEA for higher electric rates and/or RECs.
- Pursue grants and equity funds from a number of sources.
 - USDA and other grants, with the help of NCRC&D.
 - DOE grants, including GEO ARRA funding scheduled for release in 2010.
 - Contact local, regional, and national investors.
- Design and engineering.
- Project construction and commissioning.

Notable Accomplishments

Key accomplishments of this feasibility study include obtaining cooperation from three swine producers interested in moving a project forward, and then determining that a 283 kW power station creating electricity from swine waste is feasible in the case of up to 30% of project capital costs being funded by equity and the remainder funded by grants or other public funding. In addition, it was determined that if composted in windrows, the solid residuals from the digestion process would be valuable and able to be sold as fertilizer for farms. Third, solutions for extracting value from the liquid effluent include land application either in dryland or irrigated scenarios, possibly using existing large lagoons on each farm for storage, assuming regulatory and permitting barriers could be overcome. Finally, Highline Electric Association indicated willingness to purchase the renewable electricity generated by the project.