

# Does converting cow manure to electricity pay off?

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Studies have estimated that converting manure from the 95 million animal units in the United States would produce renewable energy equal to 8 billion gallons of gasoline, or 1% of the total energy consumption in the nation. Because more and more farmers and communities are interested in generating renewable energy from farm waste, there is a growing need for information on the economic feasibility and sustainability of such programs.

Now, in a case study published in the *Journal of Dairy Science*, researchers at the University of Vermont and the Central Vermont Public Service Corporation (CVPS) confirm that it is technically feasible to convert [cow manure](#) to electricity on farms, but the economic returns depend highly on the base electricity price; the premium paid for converted energy; financial supports from government and other agencies; and the ability to sell byproducts of the methane generation.

The CVPS Cow Power program assists farms in planning and installing anaerobic digesters and generators to convert cow manure into electricity, and markets the resulting power to its customers. Dairy farms apply for grants from CVPS, government agencies, and other organizations, and draw on their own funds and loans from local banks to install the necessary equipment. CVPS customers voluntarily participate in and agree to pay a premium of \$0.04 per kWh for a proportion or all of their electricity use.

"With more than 4,600 CVPS electricity customers voluntarily paying

\$470,000 in premiums per year, the Cow Power program represents a successful and locally sourced renewable energy project with many economic and environmental benefits," says lead author Dr. Qingbin Wang, a professor in the Department of Community Development and [Applied Economics](#), University of Vermont. However, the study found that because of the huge initial investment of about \$2 million for equipment per farm, grants and subsidies from government agencies have been necessary; without them, few [dairy farms](#) are able to fund such a system. The price farmers received for their [electricity](#) and revenue from byproducts of the system were also critically important.

Scenario analysis presented in the case study also suggests that relatively small changes in the premium price can have a significant impact on the cash flow of an average operation. Also, waste heat from biogas combustion can be captured and used on the farm and byproducts from the digester, in the form of animal bedding and compost, contributed significantly to the cash flow of farms – up to 26% of the total revenues in 2008.

Dr. Wang concludes, "For any community interested in a locally sourced [renewable energy](#) project like the CVPS Cow Power Program, the strong commitment and collaboration of utilities, dairy farmers, electric customers, and government agencies at the state and local level is essential."

**More information:** The article is "Economic Feasibility of Converting Cow Manure to Electricity: A Case Study of the CVPS Cow Power Program in Vermont," by Q. Wang, E. Thompson, R. Parsons, G. Rogers, and D. Dunn. *Journal of Dairy Science*, Vol. 94, Issue 10 (October 2011), DOI 10:3168/jds.2010-4124

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