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[The Sweet Smell of Being Green: “Cow Power”](#)

Published

by

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in [Articles](#), [Resources](#), [air quality](#), [fuel](#) and [pollution](#)

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Cow manure is the latest, and perhaps most unlikely, weapon in our arsenal to fight global warming.



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Emitting methane (CH₄), a greenhouse gas with 20 times the ability of carbon dioxide (CO₂) to trap heat in the earth's atmosphere, cow manure can be pretty noxious stuff. However, through a process known as biogas recovery, or anaerobic digestion, the biogas (manure-generated methane) can be “captured” and used to produce heat, hot water, or electricity.

This is hardly a new technology—it has been used on a smaller scale in countries such as India and China for ages—but more recently, it has been used to greater commercial success in European countries such as Germany, Denmark, Italy, Austria, and Sweden. In Sweden, where 7,000 cars and buses run on biogas, the process has even gone so far as one company, Svenska Biogas, boiling cow intestines to extract the maximum amount of biogas.

The United States, too, has jumped on the “cow power” bandwagon or the “manure pit” brigade. Thirty-one states, along with the District of Columbia, have enacted Renewable Portfolio Standard (RPS) programs mandating that a certain percentage of a public utility's electricity come from a renewable energy source. Biogas, along with solar, wind, biomass, geothermal, and small hydroelectric power, has been identified as an eligible renewable resource.

As a result of these statewide mandates, many U.S. companies are working with the Environmental Protection Agency (EPA) in an effort to implement this technology and reduce greenhouse gas emissions, which rose 14.7% from 1990-2006 according to a recent EPA study.

While the agricultural sector accounts for only 6% of that total, the annual greenhouse gas emissions from a 3,500-cow dairy are equivalent to the yearly emissions of 5,000 cars on the road. Put in other terms, there are about 8.5 millions cows in the United States, and according to the environmental non-profit organization Sustainable Conservation, biogas has the potential to power a million cars.

Not only cars but also homes can be powered by biogas. In California, the largest dairy state with almost two million dairy cows and also one of the world's leading carbon emitters, the 5,000-cow Vintage Dairy in western Fresno County could power about 50,000 homes in its vicinity. In 2007, Vintage Dairy owner David Albers, who founded the environmental company

BioEnergy Solutions, landed a long-term contract with Pacific Gas and Electric (PG&E) for a biogas pipeline project which, says Albers, will go a long way to achieving the state's RPS goal of a 20% reduction in greenhouse gas emissions by 2010.

In addition to the potential for reducing greenhouse gas emissions and providing an extra source of revenue for dairy farmers, advocates of "cow power" cite improved water quality and odor control. Biogas recovery helps protect streams and groundwater from untreated sewage runoff and is less odoriferous than traditional manure management systems.

This technology can be expensive though. California cheese company owner John Fiscalini spent \$3 million on a biogas recovery, or an anaerobic digester, system for his 3,000-cow business. Many dairy businesses are, however, eligible for grants to help defray the costs. Fiscalini, for example, received a total of \$720,000 as part of a United States Department of Agriculture (USDA) Rural Development Grant.

And, conversely, the anaerobic digester systems can be polluters themselves. Such has been the cause for concern at Fiscalini's operation located in California's Central Valley, a so-called "non-attainment area for ozone." When methane gas is extracted from manure, it releases nitrogen oxide (NO_x), which contributes to the smog in any given area but particularly in "non-attainment" areas like the Central Valley. Because of this danger, the allowable emissions for anaerobic digester systems have been set to 9 parts per million. Despite Fiscalini's "advanced emission control engines," the system could eventually fail the strict standard for air quality control during the 60-day testing period.

Studies are being conducted to determine why even the newer anaerobic digesters often have problems meeting the current air quality control standard. In the meantime, the dairy industry argues that this harsh regulation unnecessarily prevents the widespread implementation of a promising renewable energy source.

Only the future will tell if this technology will be able to move forward and if that sweet smell of cow manure that assails your nostrils as you walk through the countryside will be powering your car or your home.

To find out more about biogas technology, see

The AgSTAR Program

<http://www.epa.gov/agstar/>

The California Energy Commission

http://www.energy.ca.gov/pier/renewable/biomass/anaerobic_digestion/

BioEnergy Solutions

<http://www.allbioenergy.com/>

Sustainable Conservation

<http://www.suscon.org/biofuels/biomethane.asp>

Other resources:

Holland, John. "Fiscalini plan to turn methane into energy runs into air problems." *The Modesto Bee* 12 July 2008 <<http://www.modbee.com/ag/v-print/story/357872.html>>.

"Cow methane: A trump card in the fight against global warming?" *CNN.com*. 5 Oct. 2007<<http://www.cnn.com/2007/TECH/science/10/05/cow.methane/>>.

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Paperless or Less Paper?

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 photo credit: [House Of Sims](#)

Heralded as the epitome of sleek and modern, the idea of the paperless office or even the paperless society has been around since computers first appeared on the scene. And yet, we are still using paper—and a lot of it. According to Lyra Research, about 15.2 trillion pages are printed worldwide, a number that will reportedly grow 30% over the next ten years.

For its proponents, going paperless means less clutter, improved efficiency, lower costs and environmental benefits. Indeed, the idea of eliminating the mounds of papers that inevitably accumulate as we go about our daily lives certainly sounds appealing.