A stink in Central California over converting cow manure to electricity

Air-quality rules in the region leave dairy farmers facing costly changes to generators used to burn methane to produce power. Some have put their renewable-energy plans on hold

By P.J. Huffstutter, staff writer
L.A. Times, Monday, March 1, 2010

Reporting from Stanislaus County, Calif. - Central California is home to nearly 1.6 million dairy cows and their manure -- up to 192 million pounds per day. It's a mountain of waste and a potential environmental hazard.

But for dairyman John Fiscalini, the dung on his farm is renewable gold: He's converting it into electricity.

At his farm outside Modesto, a torrent of water washes across the barn's concrete floor several times a day, flushing tons of manure away from his herd of fuzzy-faced Holsteins and into nearby tanks. There, bacteria consume the waste and release methane, which is then burned in a generator capable of producing enough power to run Fiscalini's 530-acre farm, his cheese factory and 200 additional homes.

Fiscalini's resourcefulness should be drawing accolades, considering that state mandates are requiring California industries to boost renewable energy use and slash greenhouse gas emissions sharply over the next 10 years.

But efforts to convert cow pies into power have sparked controversy. State air quality control regulators say these "dairy digester" systems can generate pollution themselves and, unless the devices are overhauled, are refusing to issue permits for them.

The standoff underscores how conflicting regulatory mandates are making it hard for California to meet its green-energy goals.

"We didn't expect this," said Michael Gallo, chief executive of Joseph Gallo Farms in Atwater, Calif., whose family has spent "a lot of money" to get its dairy digester system compliant.

The idea of turning biological waste -- whether manure, trash or grass clippings -- into fuel has been around for centuries. Technologies vary, but the idea is to extract methane from decomposing organic material, remove impurities and burn it for heat, light or transport. Interest boomed after the Kyoto Protocol, the 1997 international treaty on climate change. Methane, considered by many scientists and environmentalists to be as damaging a greenhouse gas as carbon dioxide, was among the key six pollutants targeted.

Today, the European Union is leading the global charge to turn waste into watts; more than 8,000 biogas operations are up and running in Europe, and thousands more are slated to open in the next decade. The United States, which has not ratified the Kyoto accord, has only about 150 digester projects operating at livestock farms nationwide, said Chris Voell, a manager of the U.S. Environmental Protection Agency's AgStar program, which works with farmers to get such systems up and running.

Funding is an issue. Government subsidies aren't as readily available in the U.S. as they are in Europe. Just 16 digesters were operating at California dairies last year, fewer than in Wisconsin (which had 19) and Pennsylvania (18).

"California has about four times as much potential for emission reductions and energy generation as the next-largest dairy state," Voell said. "I know the regulations are much more strict in California. But there's so much potential there."

Air regulators say they understand why farmers are frustrated but point out that methane is not the only worrisome gas that pollutes. Like an internal combustion engine in a car, the generators used to convert the methane into electricity produce nitrogen oxides, or NOx.

NOx exacerbates the state's smog problem, particularly in the San Joaquin Valley, which has some of the country's dirtiest air. NOx levels for the valley are federally set. In the San Joaquin Valley, officials at the area's air pollution control district say it is their job to enforce these rules and curtail ozone pollution.

That stance has come as a shock to dairy farmers such as Fiscalini, whose $4-million digester system was set up out of frustration with regulators wanting him to fight pollution. Time and again, he said, he'd been told by regulators and read in local newspapers that dairy farmers must curtail methane emissions. Fiscalini believed that such digester systems, especially ones that converted the waste into electricity, would eventually be mandatory.

"I figured I might as well try to do this now and do some good," Fiscalini said.

He received $1.5 million in grants from the U.S. Department of Agriculture and the California Energy Commission, which was promoting the use of biogas digesters.

The $800,000 grant from the commission required that Fiscalini's system include a generator that would convert methane into energy, he said. Fiscalini started construction in 2007.

But in 2008, when work was halfway complete, he found himself stuck. Officials from the San Joaquin Valley Air Pollution Control District were blocking the farm from firing up the engine.

The concern: NOx.

Fiscalini then spent several hundreds of thousands of dollars on a catalytic converter and other filtering equipment to meet the air district's limit of 11 parts per million of NOx for new digester systems. That works out to equal the emissions of 26 cars for every 1,000 cows, said Frank Mitloehner, an associate professor at UC Davis' department of animal science.

But his worries are far from over. The digester has been running for only nine months, and he's already had to replace some of the filtering equipment and repair the generator twice.

"I wonder, sometimes, why I ever thought this was a good idea," Fiscalini said.

Air district officials said they're just doing their jobs. Combating smog, not climate change, is the agency's mission.

"The board has been clear that when we're faced with these sorts of trade-offs between reducing greenhouse gases and reducing NOx, we're going to choose NOx," said Dave Warner, director of permit services for the San Joaquin Valley air quality district.

The farmers "should have checked in with us first, before buying their equipment," he added.

Last year, six dairy digesters were shut down because of regulatory or financial problems. One of them is at Ron Koetsier's dairy in Visalia.

Koetsier had been using his digester and generator system since 2003 as a way to power his barns and eliminate his dairy's electrical bill. Southern California Edison, his electricity provider, had just opened the door in 2008 to buying his excess electricity when the San Joaquin Valley air district told him that his two generators violated local NOx emission standards for digesters.

He contacted the manufacturer of the generators. He said he was told that it would cost $100,000

in new parts to get them in compliance, and up to $50,000 a year in maintenance fees.

Koetsier shut the system down. Now the equipment is collecting dust.

"They have a point. I want clean air," Koetsier said. "But it doesn't make financial sense for me keep doing this. I don't see how they can turn methane gas into electricity in California, given these rules."

Port truckers get new rig-fix deadline

By Cecily Burt, Oakland Tribune
Contra Costa Times & Tri-Valley Herald, Sunday, Feb. 28, 2010

OAKLAND — There was a mad rush last fall to order and install new diesel filters in trucks that haul cargo at the Port of Oakland to comply with changes in air-quality rules that took effect Jan. 1.

Now, another frantic race is expected to begin next week as air-quality officials issue new grant contracts and give several hundred drivers the chance to order and install filters by April 30 — the extension allowed by the state Air Resources Board.

Trucks built before 1994 are banned from the port, and those made from 1994-2003 must have new filters installed that trap as much as 85 percent of dangerous particulates that foul the air in West Oakland. The microscopic particles can lodge in the lungs and cause cancer, asthma and other serious illnesses.

A $22 million fund established to help drivers buy the expensive filters ran out last summer and left more than 1,200 mostly independent owner-operators, who could not afford the filters on their own, facing unemployment Jan. 1.

At the last minute, Oakland Mayor Ron Dellums and his staff helped secure $11 million for drivers who were denied help last year. The grants were limited to $5,000 each, short of the $16,000 average price for a unit.

About 822 drivers renewed their filter grant applications before the Jan. 8 deadline. Of those, 666 are moving forward with their applications, said Kristine Roselius, a spokeswoman for the Bay Area Air Quality Management District, and 156 either were not eligible or withdrew their applications.

Another 44 drivers, out of 103 eligible, renewed their $50,000 grant applications to purchase new trucks.

Many of the drivers had hoped to get $8,000 more each from a Department of Labor grant being sought by the Oakland Mayor's Office, but it hasn't come through yet, senior aide Margaretta Lin said.

More than 300 drivers who did not qualify for conventional bank loans because of credit issues or income were able to get low-interest financing through Cascade Sierra Solutions, Opportunity Fund or Superior Finance Group. The rest either secured private financing or scraped together the cash on their own. The drivers had to provide proof of financing before they could get the $5,000 grants.

Representatives from the air district are conducting truck inspections this week and the grant contracts should be signed next week.

That leaves little time for ordering the filters and installing the units, dealers say, especially if the orders arrive at the same time. Last year it took several weeks to manufacture the units. The backlog of orders convinced the air board to extend the compliance deadline until April 30.

Ironman Trucking marketing representative Anna Ballou said some filter units could be ready in a few weeks, but others could take up to eight weeks. The company had about 200 filter applications lined up last year that didn't get funding. She expects they might get 80 to 100 new

orders, but nobody knows for sure. Either way, the sooner the air district signs the grant contracts, the better she will feel.

"If you can imagine, everyone is going to be (scheduled for installation) at the same time. ... I'm assuming they want to release the contracts as fast as they can, and we're just waiting anxiously for that to happen," Ballou said, adding that she anticipates that some drivers who can't get the filters in time will want an extension to keep working at the port.

"We're doing everything in our power to fill the orders by April 30, but if they release the contracts any later than next week it will be difficult," she said.

Anthony Cohen, of TEC Trucking, said that his company hasn't heard from 34 drivers who didn't get a grant last year. He's not sure whether they went elsewhere or decided to find a new line of work altogether. Russ Tuckerman, of Emissions Retrofit Group, also said that the company has only heard from about 20 percent of the drivers they worked with last year before the money ran out.

Modesto Bee guest commentary, Friday, February 26, 2010:

Pesticide regs clean valley's air

By Mary-Ann Warmerdam

Pesticide emissions that contribute to smog in California dropped significantly in 2008, the first year restrictions on agricultural fumigant applications specifically targeting air quality were in effect.

In fact, the volatile organic compound pesticide emissions declined by an impressive 30 percent from 1990 levels in the San Joaquin Valley areas that do not meet federal air quality standards — all of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare counties and part of Kern.

VOCs combine with nitrogen oxides in sunlight to form ozone, a major air pollutant. While the reduction is impressive, it is a snapshot and does not yet establish a trend. Weather and pest infestations change from year to year.

The California Department of Pesticide Regulation's draft annual report on VOC Emissions from Pesticides for 1990-2008 found that 14.5 tons of emissions were released per day in 2008 in the valley from May through October, the peak ozone season in California. This compares with 20.6 tons during the same period in 1990.

The regulations are based on 1990 emission levels because that is the year when the federal Clean Air Act first required states to track and reduce air pollution.

We credit the reduction in VOC pesticide emissions to farmers' adoption of low-emission application methods for fumigants, including tarps and application through drip irrigation systems. Typically, these gaseous pesticides are used before planting to control disease, weeds and other pests.

Pesticide applications to almond-growing sites showed the most significant decrease in emissions — 26 percent.

The 2008 data reflect a change that requires reporting of the fumigation method for every application within the five areas of the state that do not meet federal air quality standards.

For perspective, pesticide emissions comprise only about 6 percent of all VOC emissions in the San Joaquin Valley. Most emissions come from vehicles, manufacturing and industrial activities, and farming operations.

In California, the Air Resources Board has the lead role in reducing air pollutants generally. Our department regulates pesticides. VOC reductions from pesticides are part of the state's overall strategy to bring the valley into compliance with federal air quality standards.

California is the first state to identify pesticides that contribute most to air quality problems and take steps to reduce those emissions. Our department initially targeted fumigants for regulation because it was the fastest, most efficient way to reduce overall VOC pesticide emissions in the areas that do not meet air standards.

Only seven fumigants, all designated as restricted materials, are registered for use in California. Using a restricted material requires a permit issued by a county agricultural commissioner who evaluates under what conditions the product can be used and can impose restrictions developed by our department to ensure the safety of farmworkers, the public and the environment.

In contrast, there are hundreds of nonfumigants registered in the state. Most do not require a permit to use, making them more challenging to regulate.

In the San Joaquin Valley in 2008, 77 percent of VOC pesticide emissions were from nonfumigants. Our goal is to implement restrictions by 2014 to reduce VOC nonfumigant emissions.

We are very proud of our contributions to improving air quality while balancing the ability of farmers to implement changes necessary to reduce pesticide emissions. We remain committed to more reductions in VOC pesticide emissions through reformulation of nonfumigants, more efficient application technologies and pest control strategies less reliant on pesticides.

We have formed strategic partnerships with industry and are working with agricultural organizations to develop pesticide alternatives. For example, the California Fresh Carrot Advisory Board is developing alternative fumigation methods and nematode-resistant varieties of carrots. The Strawberry Commission is researching alternatives to the fumigant methyl bromide that is being phased out by an international treaty to protect the earth's ozone layer.

DPR is also working with the U.S. Department of Agriculture, University of California and U.S. Environmental Protection Agency on a project to reduce VOCs from valley peach, almond and walnut orchards. We're working with USDA's Environmental Quality Incentives Program to help farmers apply and receive financial support for using precision application technology or other practices that reduce VOC emissions.

We award grants to commodity groups to develop innovative solutions to VOC emissions and pesticide drift. Our Web site has calculators for consumers to obtain information about potential emissions from the fumigant or nonfumigant applications they are planning.

Warmerdam is director of the California Department of Pesticide Regulation. She grew up on a dairy in Hanford.