

## **With state's help, Kern dairies turn cow manure into clean energy**

By John Cox

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Roy Dowd sniffed the air during a dairy tour he was leading last week on the edge of Bakersfield.

"That's the smell of money," joked the director of operations, maintenance and research at a Visalia company, California Bioenergy LLC, helping local dairies turn manure into a new revenue stream.

Don't hold your nose: Methane from cow manure at local dairies has taken on new value as both a clean-burning fuel and a greenhouse gas to be harnessed.

Growing numbers of dairies are earning a percentage of sales from the electricity generated by combusting "biogas" produced on their property. Soon, some of the gas will be refined on site and injected for sale into natural gas pipelines.

The projects have attracted substantial public investment in expectation they will lead to cleaner air quality and lower greenhouse gas emissions. Besides being relatively clean-burning, methane is about 84 percent more potent at trapping heat, and therefore warming the planet, than carbon dioxide.

In some respects, though, California's emerging biogas industry is not quite living up to expectations. The number of installations at dairies across the Central Valley would need to accelerate quickly if the state is to meet a major legislative deadline.

Also, for all its environmental benefits, turning dairy methane into electricity is not yet price-competitive without state and federal supports. That means state and federal subsidies may have to continue longer than planned if they are to remain financially viable.

Biomethane currently costs 13 to 14 cents per kilowatt-hour to produce, while photovoltaic solar costs only about 5 to 6 cents, said Rizaldo Aldas, a supervisor with the California Energy Commission's Energy Research and Development Division. The state doesn't intend to help make up the difference indefinitely, he said.

"Somehow the cost issues need to go down in order (for biogas operations) to be self-sustaining," he said.

The situation is, to a large degree, a function of government support. State officials have spent years designing incentives to entice investment in biogas harvesting systems, which can cost several million dollars to build and millions more to form into cost-effective dairy clusters.

### **BIG INVESTMENTS**

To date, the state Legislature has set aside at least \$190 million to help pay for 60 digesters and about the same number of other dairy manure projects that reduce methane emissions without collecting the gas. An additional \$99 million in project grants is expected to be awarded later this year.

There is some concern that these subsidies, part of an elaborate system of incentives paid for by businesses and consumers, might not be enough to meet a legislative deadline that statewide annual methane emissions come in 40 percent below 2013 levels by 2030.

Industry estimates are that the current level of state funding will produce about 100 dairy digesters within the next five years. To meet the state deadline, however, air quality officials figure there will need to be five times that many in place in just 11 years.

Methane-producing dairies are "on their way, but additional ongoing support, we think, is needed for this to continue," said Floyd Vergara, chief of the industrial strategies division at the California Air Resources Board.

### **STATE SUPPORT**

Subsidies employed to date have been a mixture of direct financial contributions and market support.

One way biogas operations make money is by earning state credits through methane collection and other manure management practices. These credits can be bought on an open market by companies required to buy them, mainly air polluters and sellers of petroleum fuels.

The state also supports biogas production by requiring investor-owned utilities to buy at least 90 megawatts of electricity from agricultural products including dairy biogas. This requirement, overseen by the state Public Utilities Commission, has produced 14 dairy biogas electricity contracts. Three operations in Kern have reached such agreements.

Dairies and the biogas developers they work with may additionally receive money directly from the state.

The agency that has awarded the most biogas grants, the California Department of Food and Agriculture, gave 64 projects a total of \$114.3 million in 2015, 2017 and 2018. (No biogas grants were awarded in 2016.)

Those grants covered an average of a little more than one-third of the projects' total costs. Nine of the projects were in Kern; they received an average of \$2.1 million each.

### **SETTLEMENT CONCERNS**

While the oil industry often bristles at its added costs under the incentives system, the loudest criticism of California biogas subsidies came after a legal settlement over the massive 2015-16 Aliso Canyon natural gas leak. Southern California Gas Co., among other concessions, agreed in February to pay \$26.5 million toward capturing, treating and transporting dairy methane.

Environmentalists and people in the Los Angeles County neighborhood directly affected by the leak called the deal a geographically misplaced remedy that only fueled consolidation and growth of an industry they see as harming air and groundwater quality.

But state officials say the combination of benefits offered by biogas harvesting make it a uniquely attractive public investment.

As measured by mass, methane makes up about 9 percent of the greenhouse gases emitted in California, according to state estimates. More than half of that is believed to originate with dairies and livestock, with the rest coming from landfills, the oil and gas industry, and other sectors.

On top of the benefit of keeping it out of the atmosphere, regulators say, it is a renewable fuel that can be used in place of diesel, which causes considerably more pollution than methane.

### **CLEAN AND RENEWABLE**

Using "biomethane" for transportation instead of diesel results in a 90 percent reductions in nitrogen oxides, the precursor to smog, and a near-complete removal of particulate emissions, said Dave Warner, deputy air pollution control officer with the San Joaquin Valley Air Pollution Control District.

Methane as a use of transportation fuel "is probably the best use of that gas, actually, because it not only is very low-emitting, it also removes diesel emissions, which can be some of the most toxic emissions that are put into the air in the San Joaquin Valley," Warner said.

Bakersfield-based Gazelle Transportation, a trucking company serving the local oil and gas industry, has received grant money from the air district that has helped it cover the cost of replacing seven diesel tractor-trailers with compressed natural gas trucks.

CEO Ron Lallo said he expects to spend state and federal biomethane credits to help pay to fuel the trucks. That should help the company become carbon-neutral within a few years, a goal he said is supported by some of his larger customers in the local oil industry.

There is a risk, he acknowledged, that prices could rise to the point that diesel would be more economical.

"It's something we're going into cautiously. We're optimistic that there's a sound business case with this," he said before adding, "We're super-excited with the contributions we're making to clean the environment."