
Politics & Policy

Expansion of a Lucrative Dairy Digester Market is Sowing Environmental Worries in the U.S.

As projects spread from California to other states, generating financial dividends, some worry that the economic incentives could lead to negative environmental impacts for ever more communities.

By Emma Foehringer Merchant, Grace van Deelen
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Dairy cows at Bar 20 line up in the feedlot. Credit: Grace van Deelen

A growing national market in the proceeds from manure digesters—a technology developed to rein in emissions and fight global warming—is sowing worry that the economic paybacks could undercut U.S. climate change efforts.

Much of that concern is centered on California, which has offered carbon credits for natural gas produced by manure digesters at dairies in the state and elsewhere. Already, those incentives appear strong enough to encourage the development of digesters in other milk-producing states.

While California is widely regarded as a climate leader, having approved another headline-grabbing climate package this summer, it is also the center of U.S. milk production. That creates a conflict: Cow manure generated by the state's lucrative dairy industry produces a significant portion of the state's emissions of methane, a powerful greenhouse gas.

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As California pushes forward in its quest to slash emissions and confront climate change, the state has staked some of those ambitions on the success of its dairy digester program. Digesters process manure to capture methane and refine it into what has been dubbed “renewable natural gas.” So far the state has invested hundreds of millions of dollars in 117 digester projects within its borders.

The blossoming national market in digesters and credits for the gas they produce is seeding concern. Some California communities and environmental advocates are worried that the projects could lead to bigger dairies, more cows and more emissions. And scientists say that while the technology could play an important role in fighting climate change, more

technology could play an important role in fighting climate change, more research is needed to better understand the potential emissions from digesters and how their operation contributes to a farm's complex nitrogen cycle.

“We think that destroying methane or stopping methane emissions is critically important to really slow the climate impacts that are going to be happening in the next couple decades,” said Joe Rudek, a senior scientist at the Environmental Defense Fund who focuses on agricultural emissions. “But that being said, we don't want to sacrifice the local communities to these global interests.”

Other states are now following California, building digesters to sell natural gas to a state program and even introducing laws and incentive programs to encourage the installation of the technology. That trend could draw more communities into the debate over the digesters' merits. Since 2000, the number of digesters operating in the United States has multiplied, registering a 1,320 percent increase, according to a U.S. Environmental Protection Agency list.

In addition to offering incentives for the construction of digesters, California allows the natural gas that they produce to be sold into and receive credits from the state's Low Carbon Fuel Standard (LCFS) program. The program pays operators credits for two benefits: the emissions avoided by the capture of methane, and the lower carbon intensity of the gas created by the digesters in comparison with other fuel options like diesel.

Because the state program allows digesters elsewhere to sell fuel to the state as long as it can be transported there via natural gas pipelines, companies across the country are capturing methane and sending the gas westward. Seven states are currently delivering natural gas produced from dairy manure to California. Some companies are also transporting the electricity produced at digesters across state lines.

One company in Indiana is transporting gas produced from manure at several dairies, processing it in an unincorporated town southeast of Chicago and piping it to California for use in vehicles. A facility in West

Three companies capture natural gas from a group of dairies and send it to

Texas compresses natural gas from a group of dairies and sends it to California for use in transportation as well.

Even Oregon dairies are sending some gas to California, although the state has its own clean fuels program. Last year, the Oregon Department of Environmental Quality [fined an Oregon dairy](#) that uses a digester and sends natural gas to California for exceeding pollution limits. Wisconsin, Idaho, Arizona and Minnesota are also transporting gas produced from manure to the California market.

Digesters have existed in dairy-producing states for much longer than those introduced under California's current program. Minnesota started a methane digester loan program back in the late 1990s. But because California is allowing dairy farmers and digester developers to earn additional carbon credits by selling natural gas, some worry that it could cause dairies to increase in size and the market to grow across the country.

Back in 2005, before California created its current digester program, Bob Jennings, the district director for Rep. Devin Nunes, a Republican who recently resigned from Congress to head Trump Media & Technology Group, attended the dedication of one of the state's early methane digester systems, at a 6,000-cow operation in Lindsay. It was funded in part with \$500,000 in state funds. In a note to the dairy's owner after the ceremony, Jennings suggested that the project could "be used as a model for dairies throughout not only the San Joaquin Valley, but indeed the entire nation."

Today, the digester developers most active in California, Maas Energy and California Bioenergy, are pursuing markets outside the state.

Daryl Maas, founder and chief executive of Maas Energy, initially worked on digesters in Washington and Oregon before he built his first in California, which started operating in 2013. The company currently has projects in development and construction in Nebraska, Wisconsin and Texas. It also has digester projects in Arizona that produce electricity, but they, too, send it all to California.

Maas's business revolves around California policies incentivizing

digesters and the gas they produce. “We are looking at some other states,” he said. “But even when we build in other states, the market we want to deliver our gas to is California” because of the price on carbon credits, he added.

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CalBio sprang up after the 2006 passage of the state's AB32 law, which mandated cuts in greenhouse gas emissions. In addition to its projects in California, the company has worked on a cluster of dairy digesters in South Dakota. It has a sales representative working in Idaho and is eyeing the Texas market. “California has been driving a lot of the policy across the country,” says the company's president and co-founder, Neil Black.

Unlike California's incentive funds for digesters, which have largely funded projects tied to Maas Energy and CalBio, the low-carbon fuel standard credits are being spread among a broad assortment of developers and owners, some of them huge oil and gas companies. A digester project in Kansas **built in collaboration with the oil giant Shell**, for instance, is planning to profit from California's low carbon fuel standard. Clean

Energy Fuels, co-founded by the oil and gas tycoon T. Boone Pickens, is working with the behemoth BP on digesters in Iowa and South Dakota and has ambitious expansion plans.

“There’s no shortage of interest on the dairy side,” Clean Energy Fuels’ president and CEO, Andrew Littlefair, said on an earnings call this year. “This is nationwide, and we’re talking with dairy men and women all over the country.” The company sells renewable natural gas to California and other states.

In 2020 Washington state’s Department of Commerce offered nearly \$1 million in grants for dairy digesters. This fall the state is accepting applications for a widened \$1.8 million pool of incentive funds for digester development.

A 2021 law enacted in Iowa allowed dairies to install anaerobic digesters and increase their herd sizes if the cows’ manure are treated by the technology. The state had only four digesters before the legislation was approved. As of last December, nine dairies had requested new permits and seven planned to add more cows to their operations.

“There is a real issue of spillage these days with California policies,” said Silvia Secchi, a professor in the department of geographical and sustainability sciences at the University of Iowa.

”These spillover effects in other states and in other [agriculture] systems can have really big unintended consequences,” said Secchi, who studies the environmental impact of agriculture. This year she submitted comments to California air regulators expressing concern about how the spread of digester policies to other states like Iowa could have environmental consequences.

Maas counters that he supports dairy farms, and that digesters improve those farms’ operations by capturing emissions that would otherwise be released. Black, president of California Bioenergy, says it is not accurate to say that the digesters cause air pollution and points out that their production of natural gas helps to rein in the pollution from diesel fuel.

But Jeanne Merrill, senior policy adviser at the California Climate and

Agriculture Network, an advocacy group, said that the prospect that other states will increase herd sizes to capture funding from the state could result in “a perversion of California’s climate programs.” Merrill sat on a working group that California’s state government and regulators convened in 2017 to scrutinize greenhouse gas emissions from livestock and dairy operations and propose solutions.

The environmental group Food & Water Watch has also criticized California’s reliance on digesters and the spread of the technology across the country. “This is happening in Wisconsin, Minnesota,” said Tyler Lobdell, a lawyer with the group. “A company is building digesters in Iowa right now with express plans to make them profitable off of California’s low-carbon field standard.”

Lobdell lives in southern Idaho, home to most of the dairies in the state, which ranks third largest nationally in dairy production. Developers there are prospecting for operations where they can build digesters and make money from the California incentives, he said.

“As developers realize how much money there is to be made, it’s only going to become more acute of an issue,” Lobdell said.



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