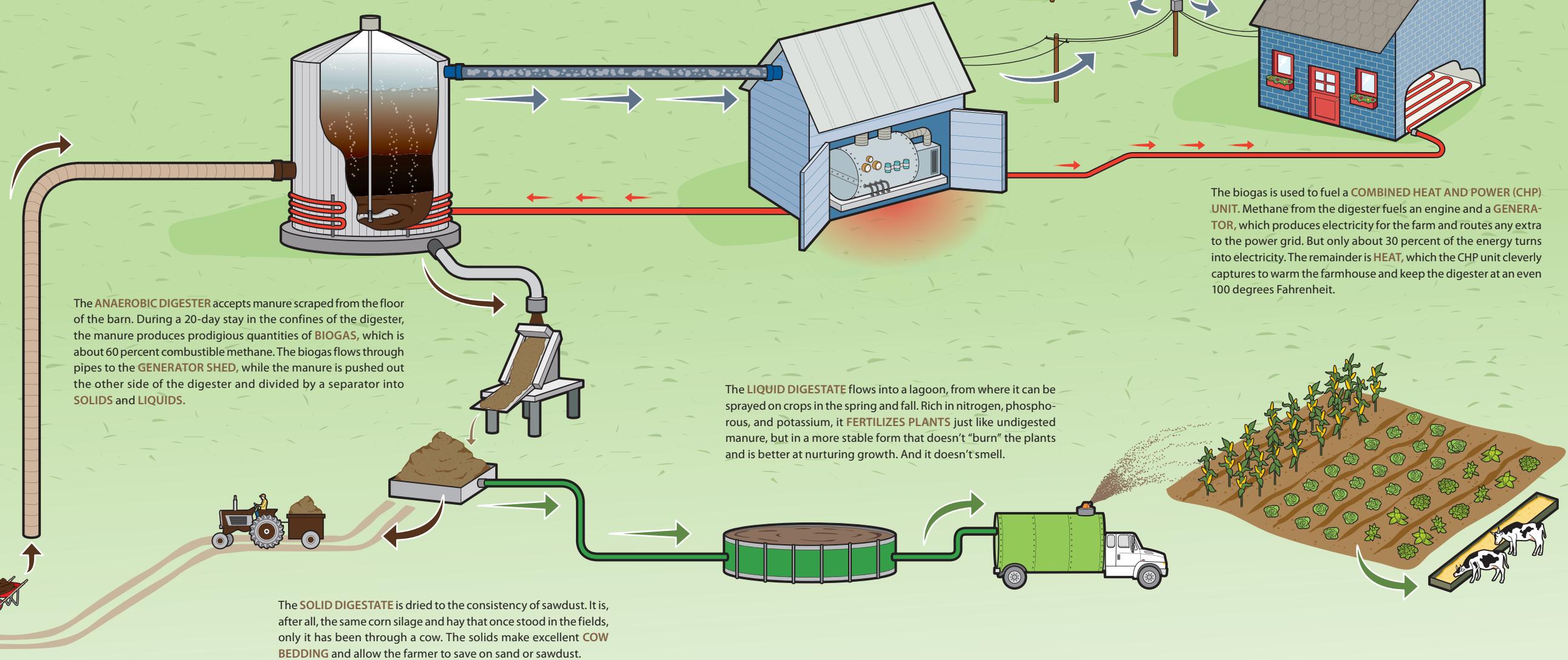


SINCE THE ADVENT OF DOMESTICATED ANIMALS, farmers have been squinting at mounds of poop. What to do with it all? The traditional answer is to spread it on the fields as fertilizer. But with the rise of anaerobic digesters, farmers are now finding that cow patties can be nearly as valuable as cows. Manure hosts microorganisms that produce methane, a powerful global-warming gas that escapes into the atmosphere as fecal matter decomposes. But when the manure is diverted to an airless tank known as a digester, the methane is burned off to create energy, and the entire waste stream becomes a commodity.

Digesters can erase some of the pollution from animal feeding operations by diverting animal waste from waterways. Today there are about 170 anaerobic digesters in use in the country's 257,000 animal feeding operations. (About 15,500 of those are the contentious "concentrated animal feeding operations," known as CAFOs.) The obstacle is that a biodigesting system costs well over \$1 million to install and requires farmhands with the time, training, and stomach to maintain it. Only farms with 500 or more cows have been able to make an anaerobic digester pencil out, and then only with the help of subsidies.



THE SMELL OF SUCCESS



ONE OF THE WORST PARTS of Steve Reinford's job was spraying raw manure onto his crops. He didn't mind the smell—it's part of being a dairy farmer—but he couldn't abide the complaints from his neighbors. "The number-one thing I had to do was something for odor control," he says.

In 2005, Reinford's son Brett came home from college and urged him to build an anaerobic digester on his 1,000-acre spread in central Pennsylvania. Brett was enthused about renewable energy, but other benefits caught Reinford's attention: The digester would kill the manure stench,

and he could make a profit by selling the power back to the local utility.

Reinford installed one of the state's first digesters in 2008, and it was a monster—twice the size he needed for the waste of his 500 cows. He intended to double his herd to take advantage of the digester's capacity, but then a waste company approached him with a surprising proposition. It needed someplace to process unsold produce from 50 Walgreens and Sam's Clubs. Was he interested?

Now a tractor-trailer comes by nearly every day to drop off tons of wizened carrots and mushy cantaloupe, an arrangement that nets Reinford about \$2,500 each week. The addition of this waste doubled his

biogas production and maxed out his generator. He currently produces 140 kilowatts around the clock, enough to power the farm and about 100 additional homes.

Meanwhile, the waste heat from the generator warms up Reinford's four-bedroom farmhouse and workshop and the water used in the milking parlor. And Reinford isn't done. "Steve has been creative and aggressive in asking, 'Where else can I replace purchased energy with this heat?'" says Robert Graves, an agriculture professor at Pennsylvania State University. "Every time you go over there, he's found some new way to do something."

The inventive 56-year-old farmer uses hot water to pasteurize the milk for his calves and routes hot air from the generator shed to dry his corn.

"We haven't bought any fuel for the last two years for the house or the barn," Reinford says. Each month he makes up to \$1,300 selling digested solids as cow bedding and another \$600 to \$700 on renewable-energy credits. Add the excess electricity he sells to the grid and Reinford estimates that he's making a pretax profit of \$200,000 a year.

And, not insignificantly, the manure smell has subsided. So while his neighbors enjoy the fresh air, Reinford enjoys the smell of money.

—David Ferris