

The simple way we might turn food waste into green energy

Why let food waste rot in landfills when it could be used to make biofuel?

by Denise Chow / Dec.13.2017 / 1:14 AM ET



— A truck dumps food waste at the Cornell Composting Facility. Robert Barker / Cornell University

Americans waste a lot of food – about 133 billion pounds a year, or roughly one-third of all the food produced in the U.S. In addition to squandering money and throwing away a precious resource, all that waste creates an enormous environmental problem. Food waste often winds up in landfills, where it rots and releases large quantities of methane, a potent greenhouse gas that contributes to global warming.

Scientists have been looking for solutions to the food waste problem, and now researchers at Cornell University in Ithaca, New York, think they've hit upon a possible fix. They say that by making use of a pair of simple chemical processes – hydrothermal liquefaction and anaerobic digestion – we could turn food waste into environmentally friendly biofuel.

The point is to “turn food waste into a valuable resource,” Roy Posmanik, a postdoctoral researcher at Cornell and lead author of a recent paper about the research, told NBC News MACH in an email.

Hydrothermal liquefaction involves heating food waste under high pressure – essentially pressure-cooking it – to create an oil that can be refined into fuel.

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Next, the watery food waste left over after the liquefaction undergoes anaerobic digestion, a process in which microbes break down the waste into biogas that is primarily composed of methane and carbon dioxide. This converted gas can be used to produce electricity and heat, according to the researchers.

Other methods of capturing methane directly from landfills and processing facilities exist, but combining hydrothermal liquefaction and anaerobic digestion is a more efficient way to process food waste, Posmanik said. “We’re talking about minutes in hydrothermal liquefaction and a few days in an anaerobic digester,” he said in a written statement.

Plus, the liquefaction step produces an additional resource from the wasted food, he added.

Posmanik foresees a day when food waste from homes, supermarkets, restaurants, and other institutions would be trucked not to landfills but to treatment plants.



— Food scraps are seen in a recycling container at MoMo's restaurant April 21, 2009 in San Francisco. Justin Sullivan / Getty Images File

What would it cost to process food waste in this way? Posmanik told MACH that more research will be needed to arrive at an answer. But, he added, “government incentives for renewable energy credits can make a lot of difference.”

That sounds good, but what do other food waste experts say?

Darby Hoover, a senior resource specialist in the food and agriculture program at the Natural Resources Defense Council, a nonprofit environmental advocacy organization headquartered in New York City, expressed doubt. She told MACH that hydrothermal liquefaction may not be the best solution because it focuses on maximizing the amount of energy extracted from food waste rather than on the amount of nutrients that can be recovered and put back into soil.

“I would prefer to see more focus on traditional composting, as well as anaerobic digestion that does result in digestate that can be used beneficially for soils,” she said. “Generally speaking, focusing on the energy production is not as ecologically important as focusing on the nutrient recycling.”

But Emily Broad Leib, director of the Food Law and Policy Clinic at Harvard Law School in Cambridge, Massachusetts, said the plan has promise.

“In particular, one of the challenges with anaerobic digestion has been that many AD facilities are unwilling or unable to process food scraps at this time,” Leib told MACH in an email. “If this process is tailored specifically to utilize food scraps... that could help to increase capacity to process food scraps and really fill that gap, especially if it is cost-effective.”



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