

# Next generation of biofuels is still years away

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In this Oct. 30, 2007, file photo, a dump wagon adds freshly gathered corn cobs to a pile on a farm near Hurley, S.D. The first trickle of fuels made from agricultural waste, including corn cobs, is finally winding its way into the nation's energy supply, after years of broken promises and hype promoting a next-generation fuel source cleaner than oil. As refineries produce this so-called cellulosic fuel, it has become clear, even to the industry's allies, that the benefits remain, as ever, years away. (AP Photo/Dirk Lammers, File)

The first trickle of fuels made from agricultural waste is finally winding its way into the nation's energy supply, after years of broken promises and hype promoting a next-generation fuel source cleaner than oil.

But as refineries churn out this so-called cellulosic fuel, it has become clear, even to the industry's allies, that the benefits remain, as ever, years away.

The failure so far of cellulosic fuel is central to the debate over corn-based ethanol, a centerpiece of America's green-energy strategy. Ethanol from corn has proven far more damaging to the environment than the government predicted, and cellulosic fuel hasn't emerged as a replacement.

"A lot of people were willing to go with [corn ethanol](#) because it's a bridge product," said Silvia Secchi, an agricultural economist at Southern Illinois University.

But until significant cellulosic fuel materializes, she said, "It's a bridge to nowhere."

Cellulosics were the linchpin of part of a landmark 2007 energy law that required oil companies to blend billions of gallons of biofuel into America's gasoline supply. The quota was to be met first by corn ethanol and then, in later years, by more fuels made with non-food sources.

It hasn't worked out.

"Cellulosic has been five years away for 20 years now," said Nathanael Greene, a biofuels expert at the Natural Resources Defense Council. "Now the first projects are up and running, but actually it's still five years away."

Cellulosic makers are expected to turn out at most 6 million gallons of fuel this year, the government says. That's enough fuel to meet U.S. demand for 11 minutes. It's less than 1 percent of what Congress initially required to be on the market this year.

Corn ethanol is essentially as simple to make as moonshine but requires [fossil fuels](#) to plant, grow and distill. For that reason, it has limited environmental benefits and some drastic side effects.

Cellulosic biofuels, meanwhile, are made from grass, municipal waste or the woody, non-edible parts of plants—all of which take less land and energy to produce. Cellulosics offer a huge reduction in greenhouse gases compared with petroleum-based fuels and they don't use food sources.



In this Oct. 24, 2013 photo Robert Malsom checks corn in one of his fields near Roscoe, S.D. Malsam nearly went broke in the 1980s when corn was cheap. So now that prices are high and he can finally make a profit, he's not about to apologize for ripping up prairieland to plant corn. (AP Photo/Doug Dreyer)

In Vero Beach, FLORIDA, for example, [agricultural waste](#) and trash are being turned into ethanol. In Columbus, Miss., yellow pine wood chips are being turned into gasoline and diesel. In Emmetsburg, Iowa, and Hugoton, Kan., construction is nearly complete on large refineries that will turn corncobs, leaves and stalks into ethanol.

But despite the mandate and government subsidies, cellulosic fuels haven't performed. This year will be the fourth in a row the biofuels industry failed by large margins to meet required targets for cellulosic biofuels.

"Has it taken longer than we expected? Yes," acknowledges Agriculture Secretary Tom Vilsack.

The Obama administration's annual estimates of cellulosic fuel production have proven wildly inaccurate. In 2010, the administration projected 5 million gallons would be available. In 2011, it raised the projection to 6.6 million.

Both years, the total was zero.

The administration defended its projections, saying it was trying to use the biofuel law as a way to promote development of cellulosic fuel. But the projections were so far off that, in January, a federal appeals court said the administration improperly let its "aspirations" for cellulosic fuel influence its analysis.

Even with the first few plants running, supporters acknowledge there is almost no chance to meet the law's original yearly targets that top out at 16 billion gallons by 2022.

"It's simply not plausible," said Jeremy Martin, a biofuels expert at the Union of Concerned Scientists. "2030 is the soonest you can anticipate it

to be at that level."

The EPA is weighing how deeply to reduce targets for cellulosic fuels for next year and beyond. Biofuel supporters want higher targets to spur investment in new facilities. Opponents want low targets to reflect what's available in the market and the chronic underperformance of cellulosic makers.

Cellulosic's great promise will likely be enough to keep it in the Obama administration's favor.

Cellulosic fuels have lagged expectations for several reasons. For one, expectations were simply set too high. To attract support from Washington and money from investors, the industry underestimated and understated the difficulty of turning cellulose into fuel.

Cellulose is the stuff that makes plants strong, and it has evolved over several hundred million years to resist being broken down by heat, chemicals or microbes. That makes it difficult to produce these fuels fast enough, cheap enough or on a large enough scale to make economic sense.

The industry was also dealt a setback by the global financial crisis, which all but stopped commercial lending soon after the [biofuel](#) mandates were established in 2007.

Hundreds of companies failed that had attracted hundreds of millions of dollars from venture capitalists and government financing.

Sometimes the microbes or chemical treatments used to break down the plant matter were too expensive or didn't work fast enough.

Other times, the problems were more prosaic. Range Fuels, based in

Colorado, failed because money dried up before it could fine-tune the machine that fed wood chips into a gassifier. KiOR, a Texas company making cellulosic gasoline and diesel in Mississippi, was delayed recently by a power failure, sending its stock price plummeting. The company has since fixed the problem, and is shipping fuel.

To supporters, these setbacks are neither surprising nor evidence of failure. Companies are trying to deliver enormous amounts of fuel using a complex, expensive process that has never been tried before.

"We may be three years late, but it doesn't make any difference globally over the long term," says Manuel Sanchez Ortega, chief executive of Abengoa, a Spanish engineering firm building a [cellulosic ethanol](#) plant in Kansas. "The first deep-water oil platform was not profitable. The first airplane was not profitable. The important thing is that it is working."

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