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As Ethanol Options Grow, So Does Debate Over Them

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CARS sped by the Citgo station on Route 109 here on a hot July day. If drivers noticed Bilal Oztimurlenk's station at all, their glance was more likely focused on the skyrocketing price of gas — \$4.21 for regular that day — than on the unfamiliar blue and yellow sign that hung just below it: a sunburst around a blue drop and three puffy white clouds. "E85," it read. "85% Ethanol."

Mr. Oztimurlenk's station is a first foothold in the New York City area for E85, an alternative fuel with a much higher blend of ethanol than has been available so far; there are about 1,200 such stations nationwide, mostly in the Midwest. Despite being linked to food shortages, high gas prices and [global warming](#), because most of it comes from corn, ethanol has boomed.

Yet even as ethanol businesses make tentative inroads into the region, there are doubts about the industry's future. Many producers and policymakers say that the way ethanol is made today is unsustainable because corn is so energy intensive to produce. The use of corn-based fuel has sparked a debate over whether crops that could feed people should be used to fuel machines.

In response, many scientists and companies — with strong encouragement from the federal government — are searching for other, nonedible sources of ethanol, also known as cellulosic ethanol.

But such concerns were not on Mr. Oztimurlenk's mind as he surveyed his one E85 pump.

"I'm a businessman," he said. "We got into this because we were following the stock market and saw how companies that were related to corn were going up. We saw no one in the area had one."

More mundane concerns over local permits had delayed Mr. Oztimurlenk, who has had fuel in the ground since late July, from selling E85. But on Monday, he sold his first gallon — at \$2.79.

"Some of the people come up to the regular line and don't know they have a flex-fuel car and we tell them they can go over to the E85 pump," he said in a telephone interview. "They're very pleased with the price."

Mr. Oztimurlenk's station is the first within 100 miles of New York City to sell E85; there are no places to buy E85 in New Jersey and Connecticut, though at least one is being planned in New Milford.

But Mr. Oztimurlenk's Citgo station may not be the only E85 source for long. Carl Vogel, who has sold biodiesel out of a tanker truck in West Babylon for the past two summers, wants to expand his fuel selections. "Compressed natural gas, E85, hydrogen and electric, as well as gas and diesel," Mr. Vogel said. He said he

received at least five calls a day from people seeking E85.

Ethanol has been considered an alternative to gasoline since the Model T, which [Henry Ford](#) built to run on both. The most common blend of ethanol fuel, E10, is 10 percent ethanol and 90 percent gasoline, and all modern, nondiesel cars can run on it. By contrast, E85 contains 15 percent gasoline, which makes for a cleaner burn but poorer mileage.

American automakers are rapidly increasing their fleet of flex-fuel vehicles, which can run on E85 or regular gas. They far outnumber hybrids, but only about six million flex-fuel vehicles are on the road now.

More flex-fuel vehicles means more ethanol demand and increasing concern over the use of corn.

“We have been accused of everything from starving poor people to increasing global warming,” said Andrew Schuyler, director of the Northeast [Biofuels](#) Collaborative, an industry group.

High corn prices have also hurt ethanol, as competition for raw materials decreased profits. “The margins have gone to zero,” said Chris Shaw, an analyst at UBS Securities who predicts that industry consolidation is coming soon. “It just got too big, too fast.”

Steven R. Jany, 57, a farmer in West Windsor, N.J., said that “back in the 2000s, we had barns full of corn.” Growers in New Jersey were looking for another way to sell their corn to stay in business, and Mr. Jany, who is also the treasurer of the New Jersey Farm Bureau, helped organize a co-op to lure the first ethanol plant to their state.

But now that demand for his corn is so high, he said, there is no longer the same need. “The market right now — anyone will buy your corn,” he said.

Roger A. McEowen, who teaches economics and agricultural law at [Iowa State University](#), said he did not see any future for corn-based ethanol. “Eighty percent of the existing plants will be dark within five years,” he said of biorefineries. “Or else retrofitted to something other than corn.”

But the drive for biofuel is not over, it is just changing direction.

At a research farm in Freehold, N.J., Stacy A. Bonos walked through waist-high rows of switch grass, stopping at a particularly robust plant and grabbing a handful of the grass. “This is what you can use for fuel,” she said. “The leaves, the stems.”

For the past four years, Dr. Bonos, a plant geneticist at [Rutgers University](#), has been one of a growing number of researchers looking at improving this native perennial grass through cross-breeding to make it a better source for a new kind of biofuel that may eventually replace corn ethanol at gas stations.

Researchers, academics and new companies are racing to come up with a practical way to produce cellulosic ethanol. Made from nonedible plant matter that often includes agricultural waste, cellulosic ethanol avoids some of the food-fuel debate and some environmental problems associated with corn production.

But it comes with its own challenges, chief among them being how to extract energy from tougher, woodier plant sources. Each cellulosic company has its own method for getting at the “trapped” fuel — acid or

microbes or enzymes (think of a cow eating grass) — but all are spurred by Congress, which has mandated that by 2022, about 15 percent of the nation’s fuel, or nearly 21 billion gallons, must come from cellulosic sources.

Today, the number produced is zero.

The Congressional mandate constitutes an ambitious doubling-down on ethanol technology and has generated a boon for the biotech and farming industries.

“Rather than cut up a smaller and smaller pie, we’re baking more pie,” said Jon Doggett of the National Corn Growers Association.

It also thrust the untested cellulosic industry into the limelight, where it is now expected to perform. A handful of commercial-scale biorefineries are under construction, from Georgia to California.

In New Milford, Conn., American Energy plans to break ground this fall on a commercial cellulosic refinery in an old brass factory. “We’re taking a dilapidated old building and bringing it back to usable life,” said Christopher Brown, the company chairman, who envisions hundreds of E85 stations in the Northeast fed by dozens of biorefineries. “Right now, there’s a need,” he said.

The federal government, the ethanol industry and many environmentalists are bullish on cellulosic ethanol in part because it can come from such a wide variety of sources: agricultural byproducts like wood chips and wheat straw, organic landfill waste like paper or vegetables, or dedicated biofuel crops, like switch grass.

Even Mr. Jany, a lifelong corn farmer, suggested that the first ethanol plant in New Jersey should include technology for making cellulosic fuel. “Then you reduce your dependency on corn,” he said.

Although there are no commercial switch grass farms in the United States, interest in the native grass has increased sharply over the past five years. Perennial grasses can be grown on marginal lands ill-suited for food, with less need for fertilizer and pesticides.

“It can grow in all sorts of places — construction sites, abandoned areas — areas that have poor soil for agriculture,” Dr. Bonos said.

Grass is only one of a number of potential ethanol sources collectively known as biomass, a term referring to any organic matter that can be used as fuel. In a 2005 study, the federal Departments of Energy and Agriculture found that, at least theoretically, the country produces enough of this organic matter to supply 60 billion gallons of fuel annually without disrupting the food supply or straining the land. (The United States consumes 140 billion gallons of fuel each year.)

But lingering questions about the cellulosic industry’s feasibility remain.

“Cellulose is going to be worse than corn, if you look at the energetics and the economics of it,” David Pimentel, a [Cornell University](#) ecologist, said. “It’s like it’s trapped in fiberglass. It takes a lot of energy to get it out.”

Land-use competition represents another stumbling block for the commercialization of cellulosic ethanol.

Just because new cellulosic crops can grow on marginal lands, as Dr. Bonos and other researchers have shown, does not guarantee that farmers will resist using more fertile lands for fuel production if the price is right.

“I don’t think we can go on faith that biofuels will work out,” said Nathanael Greene, a senior policy analyst for biofuel at the [Natural Resources Defense Council](#). “We need to require that they be good” through regulation, he said.

“It all comes back to good enforcement of the rules” by the federal [Environmental Protection Agency](#) and other agencies, he added.

The cellulosic industry’s key to success will be how well it manages the transition from corn ethanol. Biorefineries that process corn-based ethanol today will have to be retrofitted to handle other feedstocks, while combines will have to be re-engineered to harvest messier perennial plants.

Those involved in the cellulosic industry say they hope that consumers will learn to distinguish between ethanol derived from edible crops and from cellulosic crops, so that opposition to corn ethanol does not extend to cellulosic alternatives.

Indeed, stickers on gas station pumps — “Contains Ethanol,” or “10% Ethanol” — never describe how the ethanol is made or from what source. But one day, if the cellulosic industry can meet the federal mandates and grassy fuel becomes a fact of life, those stickers might read more like labels at Whole Foods: “100% Biomass Ethanol,” “Grown on Marginal Lands,” “Corn-Free.”

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