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U.S. Backs Project to Produce Fuel From Corn Waste

By **MATTHEW L. WALD**

WASHINGTON — The Energy Department plans to provide a \$105 million loan guarantee for the expansion of an ethanol factory in Emmetsburg, Iowa, that intends to make motor fuel from corncobs, leaves and husks.

Experts say that the [new factory](#), being built by POET, a major producer of ethanol derived from corn kernels, could be the first commercial-scale plant to make ethanol from a nonfood, or cellulosic, plant source.

However, POET would first have to overcome technical hurdles in scaling up its production from the current pilot project, which processes one ton of plant matter per day, to a plant capable of processing 700 tons of biomass a day. High volume is necessary to make cellulosic ethanol competitive with the corn-based version.

Commercial production of ethanol from waste products like husks is the holy grail of the ethanol industry, and other companies have stumbled in their quest to achieve that goal.

The loan guarantee for POET is the first by the Energy Department for cellulosic ethanol. But the Department of Agriculture announced \$405 million in loan guarantees in January. Coskata, a company backed in part by General Motors and by Khosla Ventures, got a guarantee for \$250 million for a plant in Boligee, Ala., that will convert household waste and other materials into ethanol. [Enerkem](#), which is based in Montreal, got an \$80 million guarantee for a plant in Pontotoc, Miss. Ineos Bio got a \$75 million guarantee for a biorefinery in Vero Beach, Fla.

If cellulosic ethanol could be produced in an economical fashion, it would vastly increase the American potential to make motor vehicle fuel and reduce use of fossil fuels. It could reduce the use of corn in the manufacture of ethanol as a motor fuel, which is criticized for reducing food supplies for people and animals.

POET's corncob plant is intended to make all the energy it needs to operate and to supply some energy to the conventional corn ethanol plant next door.

The company's pilot plant, in Scotland, S.D., has been running since 2008 and converts a ton of cobs, husks and leaves, a day into 75 to 80 gallons of ethanol.

“Our ultimate target is to be competitive with corn ethanol and gasoline,” said Jeff Lutt, president of POET. “Coming out of the gate, no one would expect it to be of equal cost.”

Today, the pilot plant is producing ethanol at a cost of \$2.50 to \$3 a gallon, which is at least 50 cents a gallon higher than the price of ethanol from corn, according to Mr. Lutt.

Because of federal mandates that fuel blenders use a certain amount of “advanced cellulosic biofuels,” blenders will pay extra for the ethanol from cellulose.

The waste parts of corn plants, called stover, are steamed and treated with acid, and then broken down by enzymes into ordinary sugar and a second sugar with one fewer carbon atom. Both are converted by yeast into alcohol, but persuading the yeast to eat the second sugar requires altering its DNA.

Cellulosic ethanol becomes more cost-competitive as the price of corn rises because the price of stover is typically more stable. The fuel also becomes more attractive as the price of natural gas rises, since corn ethanol plants use that fuel in copious amounts.

POET operates 27 corn-to-ethanol plants. The Energy Department hopes that if the technology for using stover is successful in Iowa, it will be expanded to other plants.

The loan guarantee does not ensure that POET will have a commercial-scale plant running before the others, but it “puts POET in the pole position to be first,” said Brooke Coleman, executive director of the Advanced Ethanol Council, a trade association.

Abengoa, a Spanish alternative energy company, is developing a plant in southwest Kansas that will make ethanol from crop waste. **Fulcrum Bioenergy**, of Pleasanton, Calif., is working on a plant near Reno, Nev., to convert municipal trash to ethanol.

Previous attempts to build commercial-scale cellulosic ethanol plants have failed. For example, Range Fuels developed a federally subsidized **working prototype** in an industrial park near Denver and broke ground on a commercial-scale plant in Soperton, Ga., where it planned to use pine chips as feedstock. But the company ran into technical problems.

Jonathan Silver, the executive director of the Energy Department’s loan guarantee program, said POET’s technology was “much less complicated” than some of the other entries.

While the Obama administration has been pushing a broad array of renewable energy projects, the ones in the electricity field, including solar and wind power, have shown more progress toward technical feasibility and market competitiveness than the programs to replace gasoline with batteries or liquid fuels made from nonfood sources.

However, Mr. Silver said that he believed that cellulosic ethanol technology was moving in the right direction.

“It’s not as mature as solar is, but one of the goals of this loan guarantee program is to bring all these various energy-sector technologies forward as fast as we can.”