

Making Ethanol Even Greener

The fog is starting to lift on ethanol.

For more than a year, a cloud has dimmed the greenness farmers see in ethanol. It's a fog spewed by Washington interest groups. It leads some to believe that higher corn prices loosely tied to ethanol also have this environmental side effect: Farmers in poorer countries slashing rain forests and plowing tropical savannas to plant corn and beans. That, activists argue, puts more carbon into the air than ethanol saves.

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The EPA still uses this theory, called indirect land-use change (ILUC), but in February it lowered earlier estimates of its effects. Now, ethanol and biodiesel qualify for mandates to be blended with gasoline and diesel. In May, a close look at ILUC by Purdue University found ethanol's carbon footprint 10% to 20% smaller than gasoline's.

So far, California still sees ethanol as not so green. To start enforcing its own climate law, the California Air Resources Board (CARB) created carbon intensity values for gasoline, ethanol, and other fuels. CARB gives each fuel a score, based on how much CO₂ equivalent it puts out in a unit of energy.

Gasoline's carbon intensity value is 95.86. The average for Midwest corn ethanol would be 69.4 without ILUC. But CARB adds another 30 points for land use, giving ethanol a score of 99.4. So gasoline comes out looking greener than most ethanol.

This means Midwest corn ethanol may be tough to sell in California in the future. Ethanol trade groups have sued CARB, challenging the constitutionality of its Low Carbon Fuel Standard.

Meanwhile, an ethanol plant in Winnebago, Minnesota, is poised to beat CARB at its own game. Corn Plus, a farmer-owned 49-million-gallon plant built in 1993, has become one of the nation's most energy-efficient fuel producers — and it's aiming to prove that to CARB.

In 2005, Corn Plus put in a fluidized bed reactor to burn syrup from distillers' grains for energy. It saved almost \$30 million in natural gas, well

over the reactor's \$20-million price if bought today, says manager Keith Kor.

Corn Plus gets a third of its electricity from two on-site windmills financed by John Deere.

"That was not so much cost savings, but it seemed like the right thing to do," says Bill Drager, a farmer who is the Corn Plus board president.

Like other plants, Corn Plus has had run-ins with EPA and state regulators. In 2002, they said Corn Plus was polluting the air with volatile organic compounds. Most plants added thermal oxidizers to destroy them, says Larry Becker, environmental health and safety manager for Corn Plus. His plant chose the fluidized bed to do that and to save fuel as well.

Recently, EPA and Minnesota charged the plant with water pollution. Corn Plus

Above: A thick portal shows the 1,300°F fire in the fluidized bed reactor (top). **Below:** A windmill towers over Corn Plus, saving more energy.

paid \$350,000 in fines. Once again, it's turning lemons to lemonade. It's installing a new heat pump to save energy and 10 million gallons of water a year.

Innovation hasn't stopped tough times. For part of 2008 and 2009, members covered losses with below-market prices for their corn. Today, prices are back to normal. And Corn Plus is aiming for California sales by asking CARB to credit its energy savings.

Kor says his plant's carbon intensity may be as low as 72, "which basically would be the same as Brazilian sugarcane ethanol." □

