

Oil Refineries See Profit in Turning Kitchen Grease Into Diesel

Struggling energy companies are increasing the production of renewable diesel, which can reduce greenhouse gas emissions.



By Clifford Krauss

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HOUSTON — Many businesses are betting that electric and hydrogen-powered cars and trucks will play a critical role in the fight against climate change. But some oil companies are hoping that so will smelly restaurant grease and slaughterhouse waste.

Companies that refine crude oil into fuel are increasingly using such putrid scraps to make a renewable version of diesel that can significantly reduce greenhouse gas emissions from trucks, buses and industrial equipment without requiring families and businesses to invest in expensive new vehicles and factory gear. Phillips 66, Marathon, HollyFrontier and several other refiners are spending roughly \$2 billion to retool refineries to produce the fuel over the next four years.

Renewable diesel has been around for years, and its production, while tiny compared with its fossil fuel counterpart, has grown steadily because the federal government and California offer incentives for companies to make and sell it. That support has made the fuel even more attractive to oil refiners during the pandemic because demand for regular diesel, gasoline and jet fuel has plunged as people drive and travel less.

Production of renewable diesel is up roughly 7 percent this year. If current trends continue, refineries could produce as much as 3.8 billion gallons of renewable diesel by 2025, or more than 5 percent of the total diesel production last year, according to S&P Global Platts, an energy research firm.

“Renewable diesel is a golden nugget,” said Corey Lavinsky, director for global biofuels at S&P Global Platts. “At a time when a lot of companies are struggling, we have this huge opportunity with companies announcing ambitious plans to build renewable diesel capacity.”

Some oil refining companies believe renewable diesel could help them stay profitable as governments move to significantly reduce the use of fossil fuels to address climate change — a process that is already well underway in Europe and could accelerate in the United States during the Biden administration.

Renewable diesel is appealing for several reasons. It can be used in existing diesel engines without having to be blended with regular diesel — its biggest advantage over biodiesel and ethanol, which are also made from organic material but generally cannot be used without being mixed with petroleum products. Renewable diesel, like biodiesel, is produced from waste agricultural products and animal fats, but it is processed differently to make it chemically identical to conventional petroleum diesel.

People who buy diesel may not even know they are using renewable diesel because pumps can handle it, oil-based diesel or a combination of the two and typically carry no special labels.

Burning renewable diesel produces between 50 and 80 percent less greenhouse gas emissions than conventional diesel, depending on which raw materials are used to make the fuel. And oil refineries can make renewable diesel with a few upgrades.

Governments have provided significant financial incentives for refiners to make the switch. In California, for example, refiners can earn as much as \$4 a gallon to produce renewable diesel through federal and state programs. The incentives have a certain bipartisan appeal: Democrats see renewable diesel as a way to reduce emissions, and Republicans like it because it helps oil refineries and farmers and other agricultural interests.

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Renewable diesel is emerging at a time of severe stress for the oil and gas industry, with refiners closing plants across Europe and North America. Royal Dutch Shell recently announced that it was closing its refinery in Convent, La., after failing to find a buyer, and Marathon Petroleum plans to close two plants in California and New Mexico.



The production of renewable diesel has grown steadily because the federal government and California offer companies incentives to make and sell it. Jim Wilson/The New York Times

Renewable diesel is already playing a big role for some businesses. Valero, the country's largest independent refiner, reported that its operating income from renewable diesel had tripled over the past year, to \$184 million in the third quarter. That is a big gain given that the company reported an overall loss of \$464 million for the quarter.

Valero has committed 40 percent of its spending on growth projects over this year and next to renewable diesel, which it makes through a joint venture in Louisiana called Diamond Green Diesel. It expects to increase production of the fuel to 675 million gallons a year by 2022, up from 275 million now. The company is also considering adding a plant in Texas.

Despite that optimism, some oil executives worry that renewable diesel could hit a wall in the coming years.

CVR Energy, which operates two refineries in the Midwest, is investing in one and potentially two renewable diesel facilities to help meet federal regulations.

But its chief executive, David Lamp, said the government's role in subsidizing renewable diesel made it an inherently unstable business. Federal and state incentives could encourage the industry to produce more fuel than is needed. On the flip side, he worries that Congress or California could abruptly pull the plug on incentives.

"Take one of those subsidies away and you are at break-even," Mr. Lamp said. "With the deficit situation of the federal government, some of these things are going to have to be looked at pretty hard."

Another concern is that as more refineries get into this business, it could become harder for them to find enough kitchen grease and animal fat.

"The real limit on renewable diesel is the availability of feedstock," said Kurt Barrow, a vice president at the energy research and consulting firm IHS Markit.

But Jeremy Baines, president of Neste U.S., the American unit of a Finnish energy company, is more optimistic. He expects large companies like Amazon, Walmart and UPS to increase their use of the fuel as they look to reduce the carbon emissions of their truck fleets.

"Even if you want to go 100 percent electric, renewable diesel is the only thing deployable and scalable today," he said.

Neste Oyj supplies its two biggest markets, Europe and North America, from refineries in Singapore, the Netherlands and Finland, and is looking to find or build another plant. The company collects grease from tens of thousands of restaurants worldwide, including in the United States, then mixes it with waste from around the world at its refineries. Once processed into renewable diesel, the fuel is sent around the world, including to California and Oregon. One of its customers is Oakland, which uses the fuel in city vehicles.

Companies like Neste send fleets of trucks to collect restaurant grease late at night when traffic is light and after diners have gone home so they are spared having to see what happens to kitchen waste. Drivers pull into back alleys and suck the grease with vacuum hoses or use mechanical arms to lift waste containers and empty them into their trucks.

Oscar Centeno fueled his truck with renewable diesel at a Neste station in San Leandro, Calif. The company's fuel is used in trucks and other commercial vehicles across California. Jim Wilson/The New York Times

Researchers, farmers and some environmentalists have long worked on making renewable fuels a bigger part of the nation's energy mix, with mixed success. During the George W. Bush administration, when oil prices were rising fast, ethanol became central to federal energy policy. But that fuel became less popular as shale drilling produced more domestic oil and scientists found that clearing land and growing crops for biofuels was not always environmentally sound.

Proponents of renewable diesel say it has many advantages over ethanol, especially when it is made from waste that would otherwise be dumped into landfills.

The fortunes for renewable diesel brightened in 2011 when California enacted its Low Carbon Fuel Standard, requiring sharp cuts in carbon emissions from transportation. Under the system, producers of low-carbon fuels such as electricity for electric vehicles, hydrogen and renewable diesel can sell credits to producers of high-carbon fuels. A gallon of renewable diesel can currently earn around \$1.50 under that program. (Federal programs provide as much as \$2.50 per gallon to refineries that make renewable diesel.)

Oregon and British Columbia have adopted similar systems, and Canada is scheduled to begin a national clean fuel standard in 2022. Colorado, Iowa, New York, South Dakota and several other states are also considering low-carbon fuel measures.

That's good news for refineries struggling to eke out profits during the pandemic and worried about their future in a low-carbon economy, said Mr. Barrow of IHS Markit. "Renewable diesel is a way the refining industry can get a good return with a fairly modest investment, and it's a way for them to participate in decarbonization."