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Airlines Prepare to Take Off on Fuel Made From Algae, Wood Chips, Plants

By Louise Downing

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After decades of waiting, commercial airlines have been given the go-ahead to use fuel made from algae, wood chips and other plants with obscure names.

Test flights in recent years by United Continental Holdings Inc. (UAL), Japan Airlines Co. and Virgin Atlantic Airways Ltd. have shown that planes can fly on everything from coconut oil to jatropha, a plant that grows in the tropics.

On July 1, ASTM International, an American organization that sets worldwide technical standards for the airline and other industries, gave approval for carriers to mix fuel made from organic waste and nonfood plants with kerosene, which is conventionally used to power planes, Bloomberg BusinessWeek reports in its July 11 edition.

“A lot of companies have been waiting for the certification,” says Mark Rumizen, fuel specialist at the U.S. Federal Aviation Administration. “It’s going to drive a lot of investment.”

Airbus SAS, which together with Boeing Co. (BA) makes about 80 percent of the world’s passenger planes, estimates that by 2030 plant-derived formulas could make up as much as 30 percent of the market for aviation fuel. Even so, it may take as long as five years before biofuels are cost competitive, says Billy M. Glover, managing director of environmental strategy at Boeing’s commercial airplanes unit.

Pressure is building on the airline industry to cut pollution. Aviation accounts for about 2 percent of global emissions of carbon dioxide, according to the International Air Transport Association.

Cap-and-Trade

In 2012, carriers with European routes will have to participate in the European Union’s cap-and-trade system for CO₂ and will have to buy additional permits if they exceed limits set by the European Commission. In the U.S., the Energy Department, along with state agencies, has granted a total of \$348 million in loans, grants, and tax exemptions since 2004 for research centers, fuel producers and refiners.

The trick for airlines, plane makers, and fuel suppliers will be figuring out which brew works

best and producing it in large enough quantities so that costs begin to fall. Right now, the aviation industry is most focused on the so-called second generation of biofuels.

These are made largely from inedible plants, so there's little risk that expanding production will drive up food prices, as happened with corn, which is used for ethanol.

Exxon Mobil Corp. (XOM) plans to steer \$600 million to a partnership with Synthetic Genomics, a California company that is experimenting with a type of algae that produces an oily substance good for burning. BP Plc (BP/) is conducting research into biobutanol, a fuel processed with the same bacteria used for making cordite, an explosive once used in firearms.

Organic Waste

Boeing, Honeywell International Inc. (HON) and the U.S. Air Force have tested at least 20 different types of fuel derived from organic waste and plants such as jatropha and camelina, found in parts of Europe and North America, as well as organic material, including garbage.

Boeing and Airbus are building supply networks that include growers, refiners, transporters, and distributors to bring biofuel to airports worldwide. Airbus is in the process of setting up a supply hub in India, which has the right climate for cultivation of jatropha and other plants used in biofuel production, while Boeing is negotiating with suppliers in South America.

The challenge now is building fuel production facilities fast enough to meet demand, and that may take at least three more years, says James Rekoske, vice-president of renewable energy at Honeywell's UOP unit. The company is seeking to license its technology to biofuel makers.

Jet Fuel

Neste Oil Oyj (NES1V), a Finnish oil refiner, says all four of its biodiesel production plants can also churn out renewable jet fuel, and it's in discussions with several airlines about purchase agreements.

Solazyme Inc., a California company that supplies algae-based oils to cosmetics and food companies, is also ramping up output. Chief Executive Officer Jonathan S. Wolfson said that by 2013 or 2014 his company will start producing "large commercial quantities" of its clean oils that can be refined into jet fuel.

As demand for biofuels grows, the bigger oil companies may scoop up smaller refiners. "There's a lot of synergy and advantages for Air BP, Exxon Mobil, and others to be the ones supplying all of the fuel for the airlines," says Rekoske of Honeywell. "Airlines buy their fuel from big companies because they like the security. They know they're going to get a quality material." ■

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