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THE MIDDLE SEAT
 By SCOTT MCCARTNEY


Virgin Puts Biofuels On Maiden Voyage

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Ever a showman, Virgin Atlantic Airlines President Richard Branson opened a vial of jet fuel made with oil from coconuts and Brazilian babassu nuts and drank it, forcing a stiff smile.

"It's more appropriate for the engine," he said before TV cameras. Later, he said privately that he had been told he could drink it, "but my god, it was horrible."

Sir Richard hopes that he and airline passengers will have a much better taste for "biofuel" in a few years.

On Sunday, Virgin flew a Boeing 747 from London's Heathrow Airport to Amsterdam with one of the four engines burning a mixture of 80% jet fuel and 20% oil from naturally grown plants. The first commercial airline test of biofuel came off without a hitch -- save Sir Richard's burping -- demonstrating that someday planes may not fly on petroleum alone.

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DISCUSS



1 Biofuels might be an expensive alternative. So the question for travelers is: Will you pay more to be clean? [Share your thoughts.](#) 2

Virgin, and the handful of other companies involved in the project, are hopeful that in three to six years, passengers may be riding on jets at least partially powered by naturally grown oil. The project's participants believe this could lead to a 20% reduction in total emissions.

Airlines are under mounting pressure to reduce greenhouse gas emissions that contribute to global warming, even though aviation's pollutants amount to less than 3% of all emissions. Jets are visible signs of environmental damage, and scientists have concerns that pollutants dropped directly into high altitudes may be more dangerous than those released on the ground.

Some governments around the world are already taxing air passengers to discourage the pollution they cause, and airlines will likely be included in emissions-trading systems being proposed and may soon be forced to pay for their exhaust. Environmentalists in Europe have begun to question whether ultra cheap tickets lead to frivolous travel and unnecessary pollution.



Associated Press
 Sir Richard Branson launches the first biofuel flight at Heathrow Airport.

As a result, airlines are now realizing that environmental issues, more than economic slowdowns or airspace congestion, may be the greatest threat to the future growth of air travel.

The combination of environmental taxes and high oil prices could make biofuels not only viable but also cheaper than petroleum-based fuel. On Sunday, Sir Richard called on the United Kingdom government to reduce taxes on passengers for airlines that reduce emissions, with savings passed directly to passengers. He also suggested that in the future, passengers may be able to select airlines not only on prices, schedules, amenities, frequent-flier miles and such, but also on how "green" the airline and its fuel are.

"This will encourage airline competition," he said. "Some passengers may go out of their way to fly a green airline."

Biofuel doesn't burn any cleaner in jet engines than kerosene, the basis for jet fuel today. Emissions are actually about the same, fuel experts say. But proponents say biofuel can reduce total environmental damage by 20% because it is less harmful to produce. Plants and trees producing the oils remove carbon from the atmosphere, for example, and don't come with all the drilling, refining and even shipping costs of crude oil. Recently the impact of biofuels like ethanol made from crops like corn have been questioned because of the impact on food prices, damage to farmland and pollution created producing the crops. For aviation use, fuel makers are working toward nonagricultural bio materials.

The Virgin test, done in conjunction with **Boeing Co.** and engine-maker **General Electric Co.**, came after extensive tests on the biofuel mixture by GE. The fuel was produced by Imperium Renewables Inc. of Seattle.



The biofuels being tested now can be used in jet engines without any modification, both Boeing and GE said. That's crucial to airline adoption since financially ailing airlines are unlikely to make major voluntary investments just to reduce emissions.

The U.S. Air Force and others, including Airbus, have been conducting extensive research into alternative fuels made from resources like natural gas and coal. The Air Force set a goal to have its entire fleet certified for alternative fuels by 2011.

1, calling it a precursor to biofuels. But Boeing, GE and Virgin decided to go straight to biofuels with their research.

Imperium, a four-year-old Seattle manufacturer of biodiesel fuels, was founded by John Plaza, a former **Northwest Airlines Corp.** captain who turned entrepreneur. The company solved a problem many fuel experts thought might be insurmountable -- producing a biofuel for jets that wouldn't freeze in the incredibly cold temperatures at flight altitudes.

Timothy Held, manager of GE's advanced combustion engineering division, said that just 18 months ago, biofuels were nowhere near the freezing characteristics needed for use in jets. But Imperium came up with a process that yields fuel that won't freeze at minus-47 degrees -- the toughest aviation standard.

GE tested two Imperium mixtures -- one with 20% natural oils and 80% kerosene and another with 40% natural oil and 60% kerosene. "There was no negative impact on performance," Dr. Held said.

The future for viable biofuels won't likely be coconuts and babassu nuts, however, since oil from those plants, which are both used in cosmetics, lip balms and shaving creams, can't be produced in sufficient quantity to power the world's airlines.

Mr. Plaza says Imperium's technology can make biojet fuel out of just about any renewable crop, and the substance that may hold the most promise for air travel is algae -- pond scum. Sewage-treatment plants offer an ample source, and algae-produced fuel wouldn't use up food crops like corn, soybeans or even coconuts.

A fuel that is made completely from renewable sources and has the same energy output as kerosene is possible within five years, Mr. Plaza said. But before any biofuel starts getting pumped into airplanes, manufacturing plants have to be built, fuels have to win regulatory approval and customers have to be interested. It will be a long process.

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