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# Boeing aims to quit fossil fuel habit with tobacco-based jet fuel

Pilot project with South African Airways involving nicotine-free tobacco plant can lower emissions and preserve agricultural jobs, company says

By Will Nichols | 08 Apr 2015 | 0 Comments

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The scientific consensus around smoking being bad for your health is famously as solid as that which demonstrates how human activity is contributing to climate change. Now Boeing and partner South African Airways (SAA) may have found a way to tackle both problems by producing renewable jet fuel from a special type of tobacco plant.

The two companies have teamed up for a pilot project that has seen about 120 acres (50 hectares) in Limpopo province planted with Solaris, a nicotine-free, energy-rich tobacco plant. Oil from the plant's seeds will be converted into jet fuel that Boeing says can reduce carbon emissions by as much as 80 per cent.

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In the next few years, SAA will conduct a test flight using the fuel, taking the next step on its drive to be "the world's most environmentally sustainable airline". In doing so, it will follow in the footsteps of a range of carriers, including BA, Lufthansa, Virgin Atlantic and most recently China's Hainan Airlines, in experimenting with greener fuels. In fact, more than 1,600 passenger flights using sustainable aviation biofuel have been completed since the fuel was approved for commercial use in 2011.

Two years later, the industry committed to [carbon neutral growth from 2020](#), but is still struggling to work out exactly how to achieve that goal.

Darrin Morgan, director of Boeing Commercial Airplanes' sustainable biofuel strategy, says airlines are increasingly turning to biofuels to reduce their emissions as the industry lacks other realistic options.

"Ground transport is electrifying as we speak. Power generation - they have many options to go towards renewables and decarbonise," he tells *BusinessGreen*. "Aviation doesn't - we're going to have to have liquid hydrocarbons for a very long time."

The challenge for the industry is that the oil majors who supply them have made limited progress in delivering the lower carbon fuels the sector craves. "Aviation uses only about six or seven per cent of total oil barrel use, so most of the oil companies view aviation as a very small player and it's hard for them to justify the extra effort to supply our needs," Morgan explains. "So part of why we realised we had to be so active in shaping the fuel landscape for ourselves is because we don't have other options to diversify."



The data from the first batch of Solaris is being compiled, but Morgan is optimistic. He says that if Solaris passes muster at a pilot scale, both in terms of viability and sustainability - all projects are certified to the global gold standard set by the Roundtable on Sustainable Biomaterials - the expectation is that Project Solaris will be "scaled significantly larger".

"It's being watched very carefully," he adds. "Many of the biofuel efforts in Africa have started with a lot of enthusiasm and a lot of ambition but were not executed very well. We didn't want to repeat the mistakes of other projects in Africa of going too big too quickly. We need to do it methodically."

Expansion should prove to be good news for the South African tobacco industry, which has seen its production area fall from roughly 50,000 hectares (123,500 acres) to a couple of thousand hectares as more and more people around the world stub out cigarettes for good.

Morgan says growing Solaris, which only differs slightly from standard tobacco, preserves rural jobs and the existing supply chain. The company has worked hard to get local farmers on board, funding on-the-ground efforts to train farmers with small plots of land to grow and market Solaris plants.



As well as the benefits for the local economy, Morgan says using Solaris avoids any conflict with food production, as the land being used was either already growing tobacco for smoking or largely being left idle.



Biofuels plantations have been blamed for deforestation and other land-use change and campaigners have warned these problems will get worse if airlines start demanding large quantities of alternative fuels. Morgan suggests that in South Africa, at least, this should not be a problem.

"About 14 per cent of the arable land in South Africa is under-utilised or unutilised," he adds. "If just a small percentage of that 14 per cent were used for Solaris or other similar feedstocks you would provide enough fuel for all of SAA's needs. It's not displacing essential food crops [and] it's a drop in the bucket in terms of total land footprint to produce quite a bit of what is needed."

If Solaris reaches a critical mass in South Africa, Morgan can see the potential for investing in refineries in the country, churning out not just jet fuel, but road transport fuel and renewable chemicals. This could revolutionise a country that as Morgan puts it, "failed to win the oil lottery", and, like many others in the region, relies on expensive imports of already refined petroleum.

Solaris is still in its early stages so we will have to wait to get a picture of its true potential as one of the huge range of alternate fuels that will be needed to successfully decarbonise an aviation industry responsible for around three per cent of global emissions.

Boeing is looking at a number of other options, including fuel from plants grown in the desert using saltwater, and it is optimistic that a range of bio-kerosenes promising to be both cleaner than standard fuels and with a greater energy density - essentially offering more power for less weight, a crucial property for aviation - will soon be certified for aviation use.

Currently, these fuels are sold for transport by Finland's Neste Oil and Italian company ENI, but Morgan is convinced of the potential for aviation - he says the three refineries already open in Italy, Rotterdam, and near Helsinki currently produce around four billion litres of bio-kerosene.

"Now on the global scale, that's not very much, but for aviation that's almost two per cent of our fuels use with just these initial, first of their kind renewable fuel plants," he adds.

The age of greener aviation may not have taken off just yet, but there are encouraging signs it is edging towards the runway.