

JET FUEL INTELLIGENCE®



Vol. 28, No. 28

July 16, 2018

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UK Leads Charge for SAF as Europe's First Plant Takes Shape

The UK could soon become Europe's California. Favorable legislation is pushing the country to the forefront as a regional center for sustainable aviation fuel (SAF) production, much like the West Coast state in the US. The UK government has included SAF in its Renewable Transport Fuels Obligation from 2020 and will allow so-called "development fuels" made from waste to be counted twice. Contrast that with the European Parliament's recently revealed plans to include SAF but only with a measly 1.2 times multiplier for SAF in Phase 2 of its Renewable Energy Directive from 2021 (JFI Jun.18'18). Not exactly a subsidy, the UK's RTFO allows SAF producers to make an extra £1.60 per liter (\$6 per gallon) from selling RTFO certificates alongside the fuel. "We're international companies, and we've picked the UK for our first plant as a direct consequence of the UK's RTFO," says Velocys' Neville Hargreaves, who is project manager for Europe's first waste-to-jet project alongside UK flag carrier British Airways and European major Royal Dutch Shell. Rival US sustainable fuels firm LanzaTech, UK-based airline Virgin Atlantic and European major BP, have also chosen the UK for their first commercial plant converting low-carbon ethanol produced from industrial waste emissions into jet fuel. Hargreaves suggests the EU's RED II is "best thought of as a minimum" and is hoping other EU governments will follow the UK's lead and offer additional incentives. Leading global SAF supplier SkyNRG, which is also involved in the LanzaTech project, agrees that while SAF's inclusion in RED II is a big step, "the multiplier of 1.2 is not sufficient for current commercially available technologies ... without additional support."

Velocys and partners BA and Shell are set to reveal the site of their first UK waste-to-jet plant within the next few months. Hargreaves hints it may not be near London and may not even supply Heathrow airport, as originally planned. "We're currently in negotiations with a number of sites," Hargreaves tells *Jet Fuel Intelligence*. "Obviously it will supply an airport, but it won't necessarily be Heathrow," he points out. Second stage development work has just begun following £4.9 million of funding from the

three project partners and a UK government grant for £434,000 (JFI Jun.25'18). "It's small but along with the RTFO, it shows the UK government is serious about supporting SAF," says Hargreaves. Hargreaves says the partners will make a final investment decision in 2020 with production expected to follow from 2022/23. Exact capacity and capital outlays won't be known until the design is finalized but the plant is expected to cost between £300 million-£400 million and produce around 30,000 tons per year of high-energy density SAF for blending. The partners will apply for a share of a further £20 million UK government pot, intended to help finance five projects in all under its Future Fuels for Flight and Freight Competition, before the end of this year. Current work being undertaken on the project includes securing permits, locking down waste feedstock and fuel offtake agreements and more detailed pre-front-end engineering and design (pre-Feed) work. "Money spent now will influence the success of the project," says Hargreaves. Fuel agreements will be concluded with BA and now Shell, but the details have not yet been finalized.

Europe is crying out for its own SAF production. Current demand is centered around Oslo airport but growing rapidly, met with fuel brought all the way from AltAir's renewable fuels plant in California. A series of new airport SAF initiatives in Europe, including at Switzerland's Geneva airport this December, are "doing great things on the demand side — stimulating demand to offer real price support, not just positive messages — but supply is the problem," says Hargreaves (JFI Apr.23'18). More Velocys waste-to-jet plants could follow in the UK, even before the first Velocys/BA/Shell plant begins first production, including with new project partners. "Several [UK sites] look very good," Hargreaves says, admitting that while the first plant will be built at the most convenient location, others could be developed soon after. He suggests Velocys is inundated with enquiries but is currently focused on just three projects: the UK waste-to-jet plant with BA and Shell; an already operational US site in Oklahoma making fuels from landfill gas; and a new plant in Mississippi making chemicals from forestry waste, which is also in the development stage. **JFI**