

Biofuel

Topics:

- Feedstocks
- Growth
- Certification
- EU ETS
- Price
- The future

Under the current financial constraints, compounded by jet fuel price instability and, the importance of greenhouse gas emission reduction, a viable solution to unsustainable petroleum based fuel is vital. The industry has turned to biofuel as a saviour.

Surely fields upon fields of rapeseed will be required, taking land vital for food crops. Historically, this would have been the case; however rapeseed derived oil and other 1st generation biofuels have proved not to be suitable for aviation. 2nd generation biofuel does not compete with food stocks and can be grown throughout the world. There are three principal feedstock undergoing test that fulfill Jet A1 characteristics, these are considered by the industry to be both viable and sustainable.



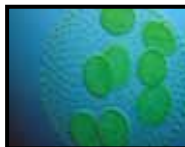
Jatropha

A toxic seed (non food source) plant containing lipid oil, easily grown in the southern hemisphere on non-arable land.



Camelina

A crop plant often used in field rotation with cereals, ideally grown in the middle latitudes.



Algae

A microscopic plant, able to be grown in the most inhospitable places with no regional exclusions. Crucially, it thrives off carbon dioxide, grows at speed and produces an estimate 15 times more oil per Sq Km than other biofuels. (i)

To set a market presence, 68,000 sq km (size of Ireland approx.) of Algae would be needed annually or 2.7 million sq km (10 times the size of the UK approx.) of Jatropha to produce 250 billion litres (ii). Once harvested, oil needs to be extracted and refined and blended using existing hydro-processing technology, even the waste can be used for fertiliser (algae) or solid fuel (jatropha). All three feedstock will remain prevalent allowing for diversity throughout the worlds growing regions, so don't expect one field of each.

'Drop-in' describes replacing traditional fuel with either blended or 100% synthetic fuel. Certification is to follow successful laboratory and flight tests, such as Continental Airlines using 50% Jet A1, 47% jatropha and 3% algae on a Boeing 737 in early 2008 (vi). Once fuel specification bodies such as the UK's Defence Standards Agency are satisfied, certification can be expected, a 50/50 blend is due by 2011 and 100% 'drop-in' by 2013.

Should the industry commit? The UK has the highest CO₂ emission in Europe with a 12 month rolling average of approximately 60.3 million tons (mt) (iii). On a grand scale, in 2010 the EU will produce 173mt of CO₂. This is estimated to be in the region of 2% of all man-made emissions. In this context, reduction would make a small contribution. The European Union Trading Scheme (EU ETS) a framework of emission reduction will grant allowances to operators from 2012, forcing airlines to pay for emissions, in the region of €15 per ton of CO₂. IATA estimates this to be \$1.34 bn in 2012 rising to \$19.48 bn in 2030 (iiii). If airlines choose to embrace biofuel, savings of \$2.06 bn could be made in 2020 rising to \$5.84 bn in 2030. This saving is reliant on bio fuel and Jet A1 having comparable prices.

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Due to lack of production data, biofuel prices are hard to predict. Solix, an algae-derived biofuel producer cited \$32.81 a gallon at present with business plans to slash prices by 90% to \$1.57 a gallon (\$60-\$80 barrel) over time (iv). As an example US car corn-ethanol production costs have declined by 60% from \$800/m³ in 1980 to \$300/m³ in 2005 (vii). In 2010 Jet A1 costs \$3.31 a gallon (\$139 barrel) with a predicted upward trend (iii). Underlying scepticism about biofuel viability because of oil price volatility should be a balanced one, as a recent move by a core group of Air Transport Association airlines who signed a memorandum of understanding with AltAir Fuels for 75 million gallons per year of camelina oil derived biofuel (v) highlights commitment from the airlines.

Biofuel does have sustainability, allowing airlines to avoid paying carbon allowances, and will move the industry away from petroleum dependence into a new era, only with financial commitment now to prove and establish a viable product. Cohesion between all airlines, fuel manufactures and governments is essential, at present polar approaches feed society doubt.

References:

- i. Air Transport Action Group, (2009). Beginners Guide_Biofuels_WebRes.pdf
- ii. RDC Aviation, (2009). http://www.rdc-store.com/index.php?main_page=product_info&cPath=5_11&products_id=192
- iii. International Air transport Association (2008), IATA Economic Briefing: Outlook for oil and jet fuel prices, IATA
- iv. Kanellos, M (2009), Algae Biodiesel: It's \$33 a Gallon, Greentech media <http://www.greentechmedia.com/articles/read/algae-biodiesel-its-33-a-gallon-5652>
- v. Tam, M (2010), Sustainable Flying: Biofuels as an Economic and Environmental Salve for the Airline Industry, EQ² http://www.eq2.uk.com/pdf_resources/Aviation_biofuel.pdf
- vi. Lane, J (2009), Continental Airlines tests aviation biofuel: first use of algae: first US biofuel test flight: first two-engine flight, Biofuels Digest <http://www.biofuelsdigest.com/blog2/2009/01/08/continental-airlines-tests-aviation-biofuel-first-use-of-algae-first-us-biofuel-test-flight-first-two-engine-flight/>
- vii. Hettinga, W.G et al (2009), *Energy Policy, Volume 37, Issue 1, Understanding the reductions in US corn ethanol production costs: An experience curve approach*

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