Sustainable Fuels Offtake Agreement - Airline Perspective

November 16 2018
• Based in Hong Kong, with services to 200 destinations
• Fleet of 196 aircraft
• Consume around 2 billion gallons of fuel a year
Biofuel Initiative: Flying A350 deliveries from TLS- HKG with biofuel blend

- Collaboration with Airbus and TOTAL
- 42 flights in total (22 x A350-900 and 20 x -1000) from 2016-2021
- 80-100,000 gallons in total
Biofuel Initiative: Fulcrum Bioenergy investment and offtake agreement

- Invested in Fulcrum Bioenergy in 2014
- 375m gallons off-take agreement over 10 years
- Sierra Biorefinery (10m gallons/ year) broke ground May 2018- expected completion 2020+
Additional components compared to traditional jet fuel supply agreement

What are some things an airline would look for in biofuel offtake agreement with a supplier?:

1. “We want to ensure clarity of costs/ value of using biofuel”

2. “We want to be reassured of the fuel quality and sustainability story”

3. “We want to be confident of receiving the fuel”
Biofuel pricing can be more complicated than traditional jet

- Traditional jet fuel pricing structure - typically jet market price (e.g. platts) + differentials + logistics/ storage

![Diagram showing jet fuel pricing structure]
Biofuel pricing can be more complicated than traditional jet

• With biofuel, offtake agreement should ideally be clear about incentive schemes and the party benefiting

<table>
<thead>
<tr>
<th>Producer / Supplier</th>
<th>Airline/ User</th>
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<tbody>
<tr>
<td>Cost of production (feedstock, processing, capital)</td>
<td>Net fuel cost to user</td>
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<td>Additional margins, logistics costs</td>
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<td>Producer rebates / incentives (e.g. RINS)</td>
<td>User carbon ‘value’ (e.g. CORSIA)</td>
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<td>Selling price to user</td>
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Carbon value depends on feedstocks and pathway

- Life cycle carbon reduction can be considerably different and offer different value

Illustrative

Example: Value per gallon @$20/tCO2

- Conventional jet: US$0.15
- HEFA-Cooking Oil: US$0.15
- FT-MSW: US$0.16
- HEFA-Palm Oil: US$0.04
Biofuel may also offer opportunity for different pricing model

- Different feedstocks (e.g. non commodity), production cost structures may offer different pricing models
Sustainability certification/standards is important to include in offtake agreement

- Terms in offtake agreement that ensures fuel is certified - what criteria and what standards?
- And also ensure costs of certification set out

New airplane biofuels plan would 'destroy rainforests', warn campaigners

Plan to accelerate production of biofuels for passenger planes would lead to clearing of rainforests to produce 'vast' amount of necessary crops

Aviation biofuels: won’t get fooled again

Published on March 14, 2017 - 11:07
Offtake agreement could be with a biofuel supplier or jet fuel supplier

- Options:

  - Buy blended fuel from supplier
  - Buy biofuel only (need to include provisions around how fuel would be blended and delivered)
Biofuel blending and delivery mechanism should be considered in offtake agreement

- Biofuel need to be blended. How is this done and where?
- Offtake agreement should be clear on responsibilities, costs for blending and delivery

- Where is this done?
- Can airport/ fuel infrastructure support?
- Who will provide jet fuel and who will blend?
Conclusion

• Biofuel offtake agreement differ in many aspects compared to traditional jet fuel

• As its relatively new industry, additional care should be given to be clear on pricing, standards and delivery:
  • Ensure pricing structure is clear and who benefit from incentive schemes
  • Ensure desired quality standard and sustainability criteria are set out in the agreement
  • Ensure logistics/ blending, delivery costs and approach are considered and factored
  • Challenge of timeline and flexibility to accommodate changes