Carbon Offset Schemes for Aviation: *Inconsistent supply and weak demand. What hope for the future?*

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Presentation Outline

1. Brief introduction to carbon offsetting

2. Offset provider review

3. Carbon compensation air passenger survey

4. Conclusions
Brief introduction to carbon offsetting
Voluntary Carbon Market

Definition of carbon offsets:

Carbon offsetting is a mechanism for compensating for greenhouse gas emissions generated by a particular activity by paying for equivalent emissions savings or reductions to be made elsewhere in the economy.
Voluntary Carbon Market

• Value of voluntary offset:
  – Between 2005 and 2006 more than tripled
  – Between 2006 and 2007 tripled
  – Between 2007 and 2008 grew rapidly
    ...growth has begun to stagnate

• Quality of the providers in the market
Omega Carbon Offset Study: Offset provider review
Omega Offset Study

- This project aimed to review current services to air passengers and explore passenger attitudes to offset:

- The first step was an offset service provider review: undertaken in 2007, websites of 42 online providers of aviation offset services were examined.
The offset process for air passengers

- Distance
- Emissions Factor
- Distance
- CO₂
- Total CO₂e emission
- Radiative Forcing Index

Series of initiatives to save carbon emissions

Total carbon savings for investment in range of carbon saving projects

Cost to offset!

CO₂ saving/£
Provider review: Key findings

- **Carbon calculators:** Inconsistent outcomes and a lack of explanation of underlying assumptions. DEFRA and ICAO attempts at standardisation. Complex models.

- Unit price of carbon
- Cost to offset
- Assurance
- Transparency
The Carbon Calculator

- Carbon Calculators determine the emissions from a given flight
- Ideally these fulfil three requirements:
  - Educate the consumer
  - User friendly
  - Accurate
- Above all underlying assumptions should be made clear given the possible range of complexity.
Elements of the carbon calculator

Distance travelled x an emissions factor = carbon emitted

• More complex calculators include information on:

Type of aircraft, fuel use, occupancy rate, route, cruising altitude, time of day flown, weather conditions.

• Survey demonstrated consistent outcomes based on GCD with some adjustments for route planning.

• Significant variation in EF applied.
Calculated emissions: LHR - CDG

CO2 emissions (tonnes) for short haul sample flight:
- Calculated emissions including an RFI
- Calculated emissions excluding an RFI
Calculate emissions: LHR - SYD

CO2 emissions (tonnes) for long-haul sample flight:
- Blue: Calculated emissions including an RFI
- Red: Calculated emissions excluding an RFI
Emission Factors

• Varied in relation to:
  – Use of RFI (1, 1.9, 2.7 and 3)
  – Load factors
  – Sample aircraft used to compose the operating fleet
  – Variations in fleet mixes
  – Application of an uplift factor
  – How freight is accounted for
  – Average seating configurations
  – Allocation of carbon liabilities between different seating classes
ICAO and DEFRA EF compared

<table>
<thead>
<tr>
<th>Calculator</th>
<th>Emission Factor (gCO₂/pkm)</th>
<th>Total Emissions for sample flight to Sydney (tCO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAO (for economy seat)</td>
<td>Variable*</td>
<td>1.43</td>
</tr>
<tr>
<td>DEFRA long-haul average (Option 1)</td>
<td>81.5</td>
<td>1.39(1.51)</td>
</tr>
<tr>
<td>DEFRA long-haul economy (Option 1)</td>
<td>59.5</td>
<td>1.01 (1.10)**</td>
</tr>
<tr>
<td>DEFRA long-haul average (Option 2)</td>
<td>100.9</td>
<td>1.71 (1.87)</td>
</tr>
<tr>
<td>DEFRA long-haul economy (Option 2)</td>
<td>73.7</td>
<td>1.25 (1.37)</td>
</tr>
</tbody>
</table>

* ICAO use a variable CO₂ per passenger figure dependent upon specific data for city-pair identified by the user. The latter influence aircraft types and loads factors in calculating emissions.

** Figures in parentheses indicate total CO₂ emissions where the DEFRA recommended an alternative means of allocating carbon liability to any freight carried with passengers.
Provider review: Key findings

- Carbon calculators

- **Unit price of carbon:** Prices varied considerably from £2/tCO₂e to £18/tCO₂ - influenced by nature of carbon saving investments and administrative costs.

- Cost to offset

- Assurance

- Transparency
The cost of offset products

- Possible costing options:
  - Social cost
  - Abatement cost
  - Market price

- Influences on abatement costs
  - Location
  - Inherent efficiencies associated with type of project (i.e. carbon savings per £ invested)
  - Levels of assurance and verification
  - Administration and mark-up costs
Fund Allocation

Percentage of cost to offset project

Number of Providers

- 50.54%
- 55.59%
- 60.64%
- 65.69%
- 70.74%
- 75.79%
- 80.84%
- 85.89%
- 90.94%
- 95.99%
- 100%
Unit cost of carbon

Cost per unit of CO$_2$

Number of Providers

£1.00  £2.00  £3.00  £4.00  £5.00  £6.00  £7.00  £8.00  £9.00  £10.00  £11.00  £12.00  £13.00  £14.00  £15.00  £16.00  £17.00  £18.00
Provider review: Key findings

• Carbon calculators

• Unit price of carbon

• **Cost to offset:** Journey offset costs varied widely, reflecting unit prices and carbon liability calculations.

• Assurance

• Transparency
Cost to offset LHR to CDG

The University for World-Class Professionals

Cost to offset sample short-haul flight

Number of providers

Cost to offset LHR to CDG
The University for World-Class Professionals

Cost to offset LHR to SYD

- £0 - £20
- £21 - £40
- £41 - £60
- £61 - £80
- £81 - £100
- £101 - £300
- £301 - £600
- £601+

Cost to offset sample long-haul flight
### Seating class and offset price

<table>
<thead>
<tr>
<th>Offset Provider</th>
<th>Economy</th>
<th>Business Class</th>
<th>First Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CO₂ Emissions</td>
<td>Cost</td>
<td>CO₂ Emissions</td>
</tr>
<tr>
<td>A</td>
<td>0.07 tonnes</td>
<td>£4.29</td>
<td>0.10 tonnes</td>
</tr>
<tr>
<td>B</td>
<td>0.20 tonnes</td>
<td>£9.84</td>
<td>0.30 tonnes</td>
</tr>
<tr>
<td>C</td>
<td>0.14 tonnes</td>
<td>£0.99</td>
<td>0.28 tonnes</td>
</tr>
<tr>
<td>D</td>
<td>0.10 tonnes</td>
<td>£1.39</td>
<td>0.23 tonnes</td>
</tr>
<tr>
<td>E</td>
<td>0.11 tonnes</td>
<td>£1.00</td>
<td>0.16 tonnes</td>
</tr>
</tbody>
</table>
Provider review: Key findings

- Carbon calculators
- Unit price of carbon
- Cost to offset
- **Assurance:** Mine-field
- Transparency
Third party verification

- Full-fledged offset standards
  - CDM, VER+, CCX, Gold Standard, VCS
- Project design standards
  - CCBS
- Offset standard screens
  - VOS
- Offset accounting protocols
  - ISO 14064-2
- Other standards
Provider review: Key findings

- Carbon calculators
- Unit price of carbon
- Cost to offset
- Assurance

**Transparency:** performance inconsistent
Transparency issues

1. Provider history
2. Annual reports
3. Project selection
4. Monitoring
5. Fund allocation
6. Additionality tests
7. Double counting
Provider review conclusions

- Carbon calculators: inconsistent outcomes and lack of explanation - *undermines credibility*
- Standardisation efforts sending mixed messages - *undermines credibility*
- Massive variation in unit price for carbon (£2/tCO\(_2\)e to £18/tCO\(_2\)) - *undermines credibility*
- Cost to offset difficult to explain rationally - *undermines credibility*
- Opportunities to educate and raise awareness under-exploited
Omega Carbon Offset Study: Passenger Survey
Passenger survey

- January and February 2008

- 487 passengers at Manchester Airport surveyed

- Questionnaire developed in consultation with stakeholders from government, industry, NGOs and research institutions.

- Aimed to establish attitudes to climate change and offsetting amongst passengers to help in identifying factors that may affect the level of uptake of carbon offset services in the future
Passenger survey: key findings

- **Attitudes towards climate change and air transport:** climate change a genuine threat, air transport influence on the climate – not reflected in behaviour. Government and airlines primarily responsible for aviation emissions.

- **Awareness and use of offsetting**

- **Willingness to pay**
CC a genuine threat

- Strongly agree: 30%
- Agree: 60%
- Neither agree nor disagree: 5%
- Disagree: 5%
- Strongly disagree: 0%

Air travel influence on CC

- Strongly agree: 10%
- Agree: 60%
- Neither agree nor disagree: 15%
- Disagree: 15%
- Strongly disagree: 0%
View on CC influences flying choices?

- Yes: 0%
- No: 100%
- Don't know: 0%
Passenger survey: key findings

- Attitudes towards climate change and air transport

- **Awareness and use of offsetting** majority aware of offsetting in general, many unaware of flight-specific offset. Passengers confused about, the nature, purpose and methods of offsetting

- Willingness to pay
Reasons for not offsetting their flight

- 'Did not know it was possible'
- 'Did not know how to do so'
- 'Could not afford to do so'
- 'Don't believe Schemes are effective'
- 'Don't believe the money would be properly invested'
- 'Other reason'

50%
40%
30%
20%
10%
0%
Passenger survey: key findings

- Attitudes towards climate change and air transport
- Awareness and use of offsetting
- Willingness to pay: few willing to pay the full cost of offsetting; may be more willing to fund CC mitigation/compensation.
Willingness to pay
Voluntary for passengers?

Airlines legally required to include offset in ticket price?

- Voluntary for all passengers: 50%
- Compulsory for all passengers: 40%
- No preference: 10%
- Don't know: 0%

- Yes: 60%
- No: 30%
- Don't know: 10%
When to pay?

Increased willingness to pay...

- When I purchase my ticket
- At the airport
- On the internet
- Other
- Not prepared to pay for offset

- The scheme supported local offset projects
- The scheme supported offset projects in developing countries
- The scheme met UN standards for offsetting
- The benefits of the scheme were transparent and well publicised
- Other
Passenger survey conclusions

• Attitudes towards climate change and air travel do not influence passengers travel habits.

• Whilst there was a general knowledge about offsetting, there was a low awareness of aviation offsets.

• The survey showed that there was a willingness to pay for climate compensation.

• The nature of the offset provision is important to the public e.g. That the offset schemes are transparent and well publicised.
Overall conclusions
Overall offset study conclusions

- Current inconsistencies in the market undermine the credibility of the service

- Enhanced uptake of voluntary services requires:
  - Heightened profile of schemes and their benefits
  - Consistent means of calculating CC emissions liabilities
  - Simply product offerings – fixed amounts of compensation

...
Offset quality key requirements

V erified
A dditional
L eakage-free

not I mpermanent
not D ouble-counted
...and finally

• More work needed to:
  – Establish ‘fit for use’ method of calculating flight emissions
  – Determine customer acceptance of simplified payments
  – Establish potential future of the market...demand?