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ICAO Colloquium on Aviation and Climate Change

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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

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Brief introduction to carbon offsetting

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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

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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

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Omega Carbon Offset Study: Offset provider review

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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.

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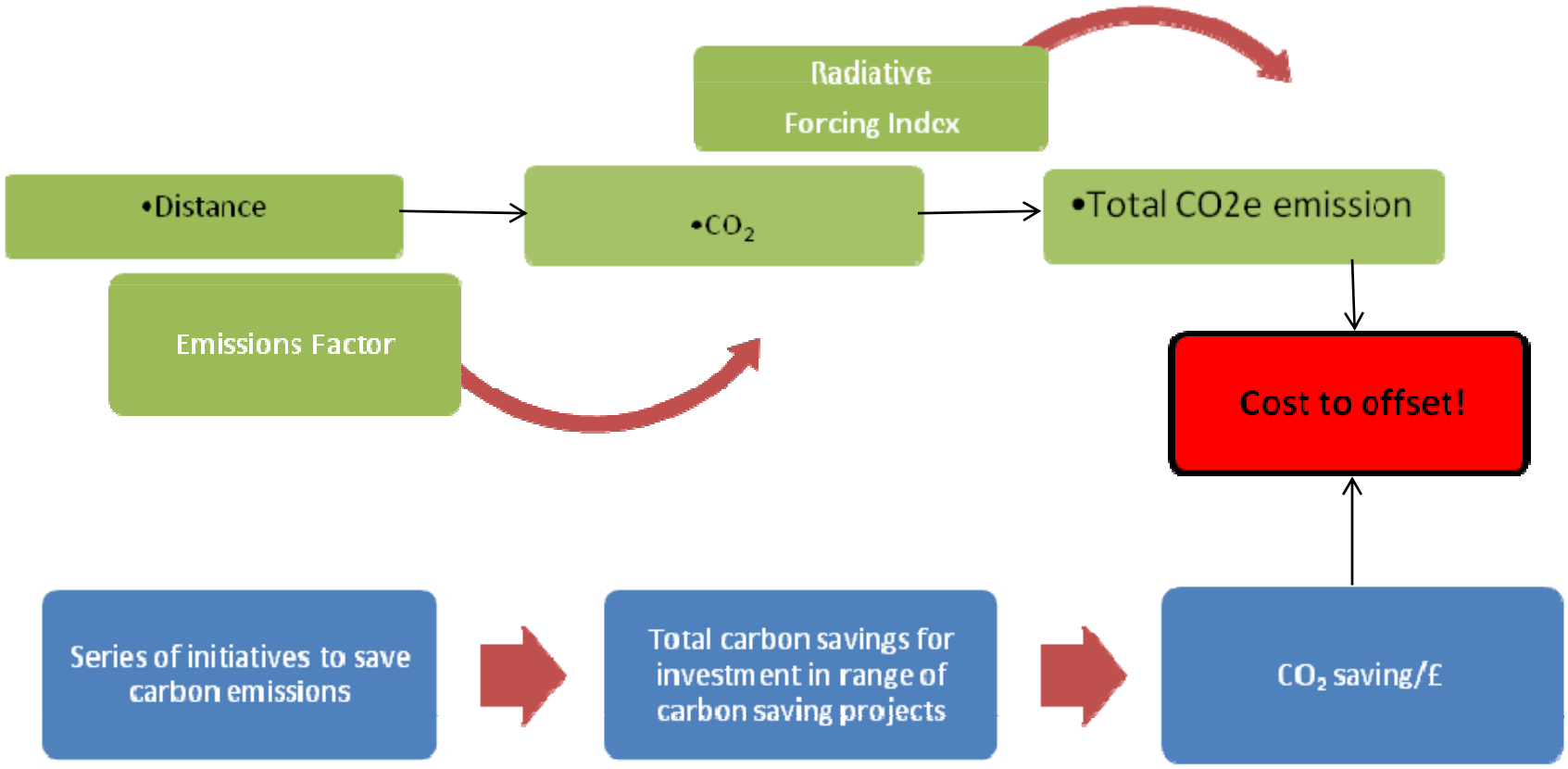
The offset process for air passengers



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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

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The Carbon Calculator

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- 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.

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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.

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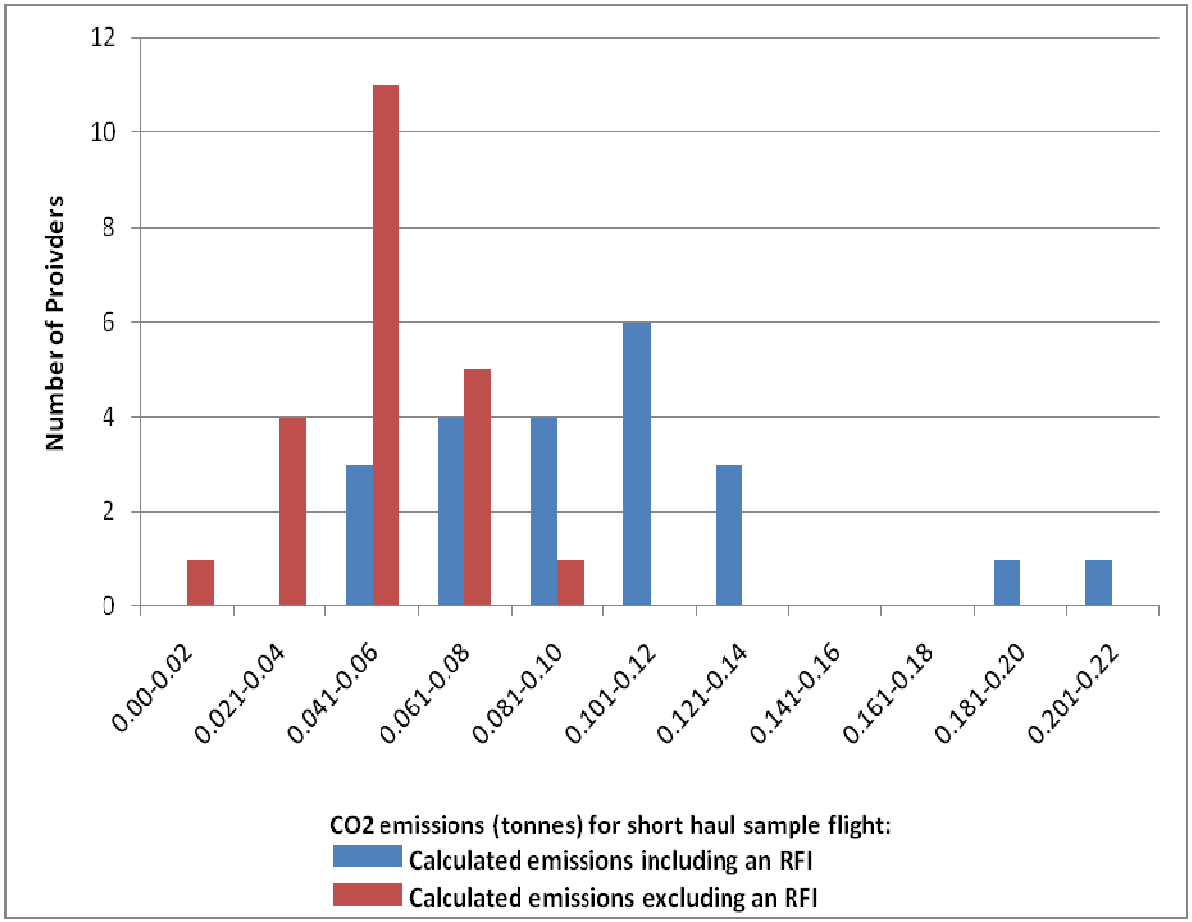
Calculated emissions: LHR - CDG



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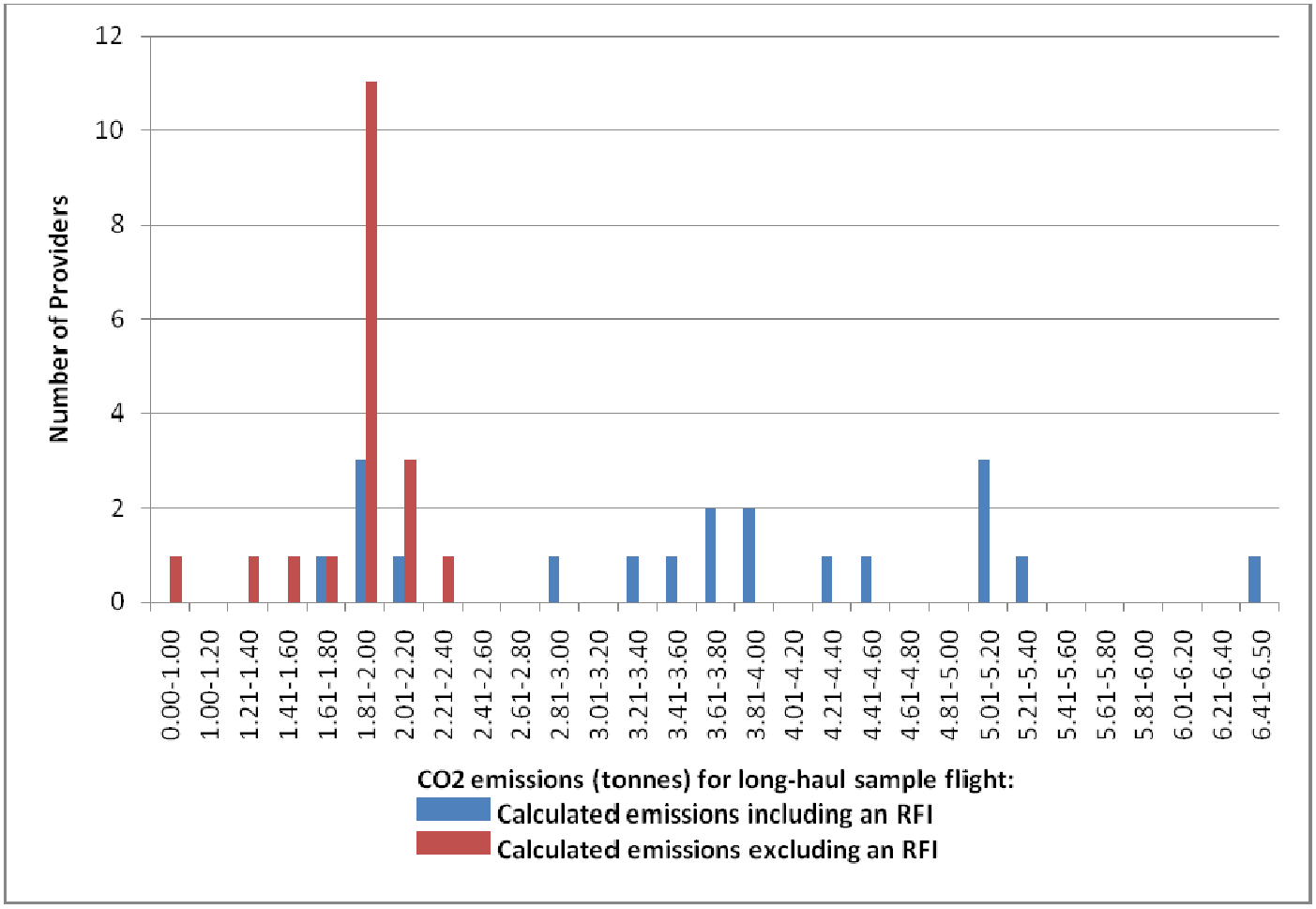
Calculate emissions: LHR - SYD



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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

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ICAO and DEFRA EF compared

Calculator	Emission Factor (gCO_2/pkm)	Total Emissions for sample flight to Sydney (tCO_2)
ICAO (for economy seat)	Variable*	1.43
DEFRA long-haul average (Option 1)[12]	81.5	1.39(1.51)
DEFRA long-haul economy (Option 1)	59.5	1.01 (1.10)**
DEFRA long-haul average (Option 2)	100.9	1.71 (1.87)
DEFRA long-haul economy (Option 2)	73.7	1.25 (1.37)

* ICAO use a variable CO_2 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 CO_2 emissions where the DEFRA recommended an alternative means of allocating carbon liability to any freight carried with passengers.

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Provider review: Key findings

- Carbon calculators
- Unit price of carbon: Prices varied considerably from £2/tCO_2e to £18/tCO_2 - influenced by nature of carbon saving investments and administrative costs.
- Cost to offset
- Assurance
- Transparency

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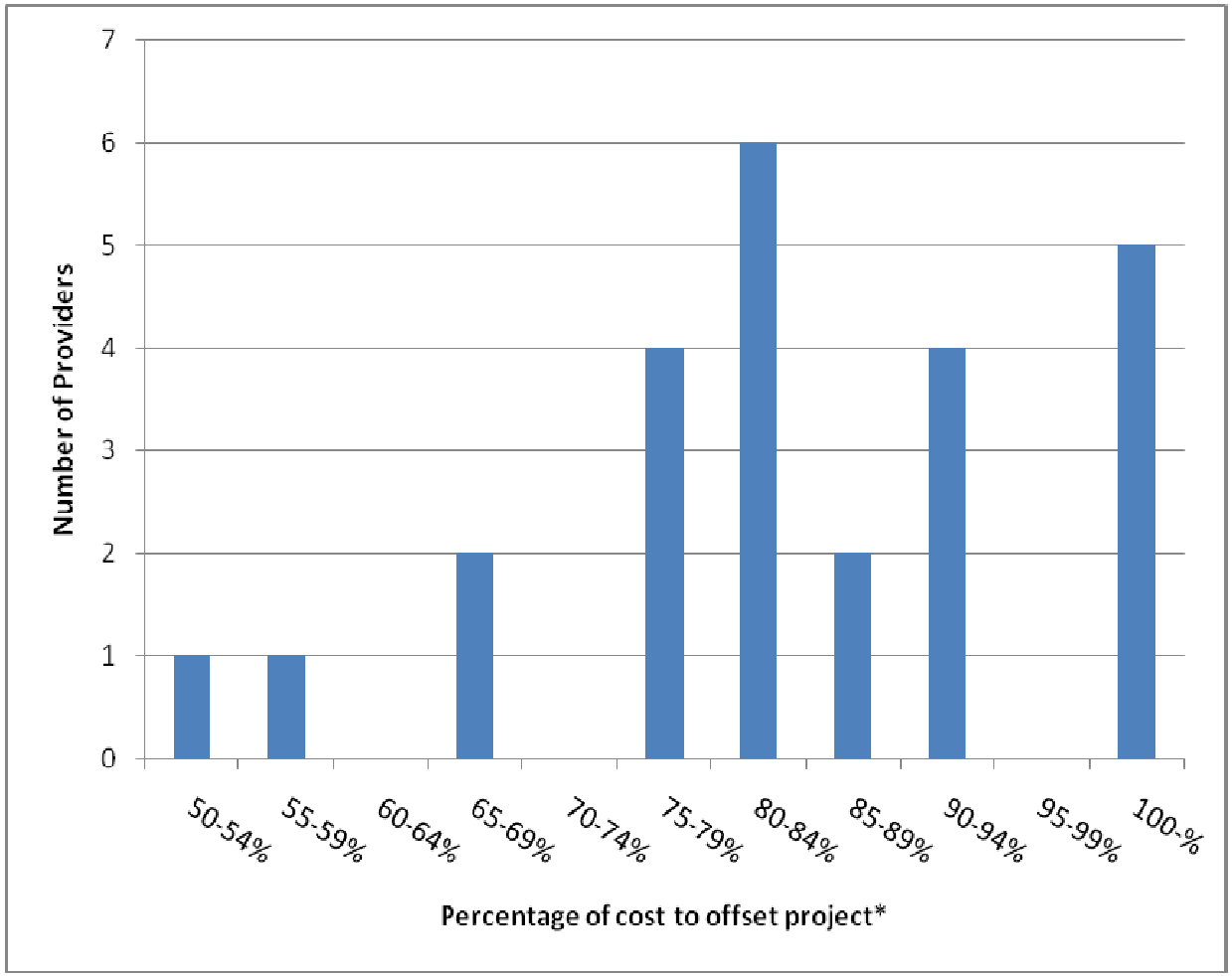
The cost of offset products

- 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



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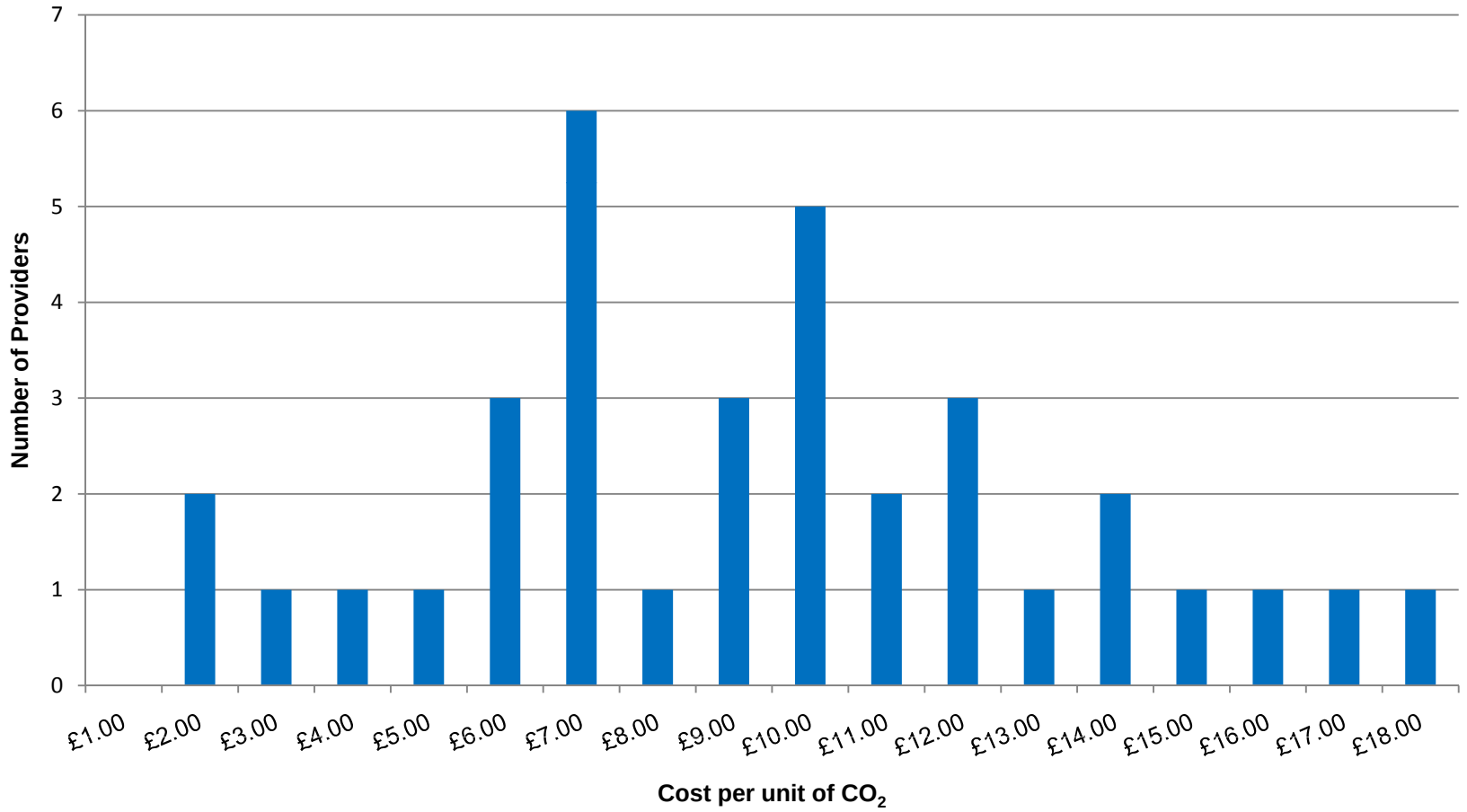
Unit cost of carbon



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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

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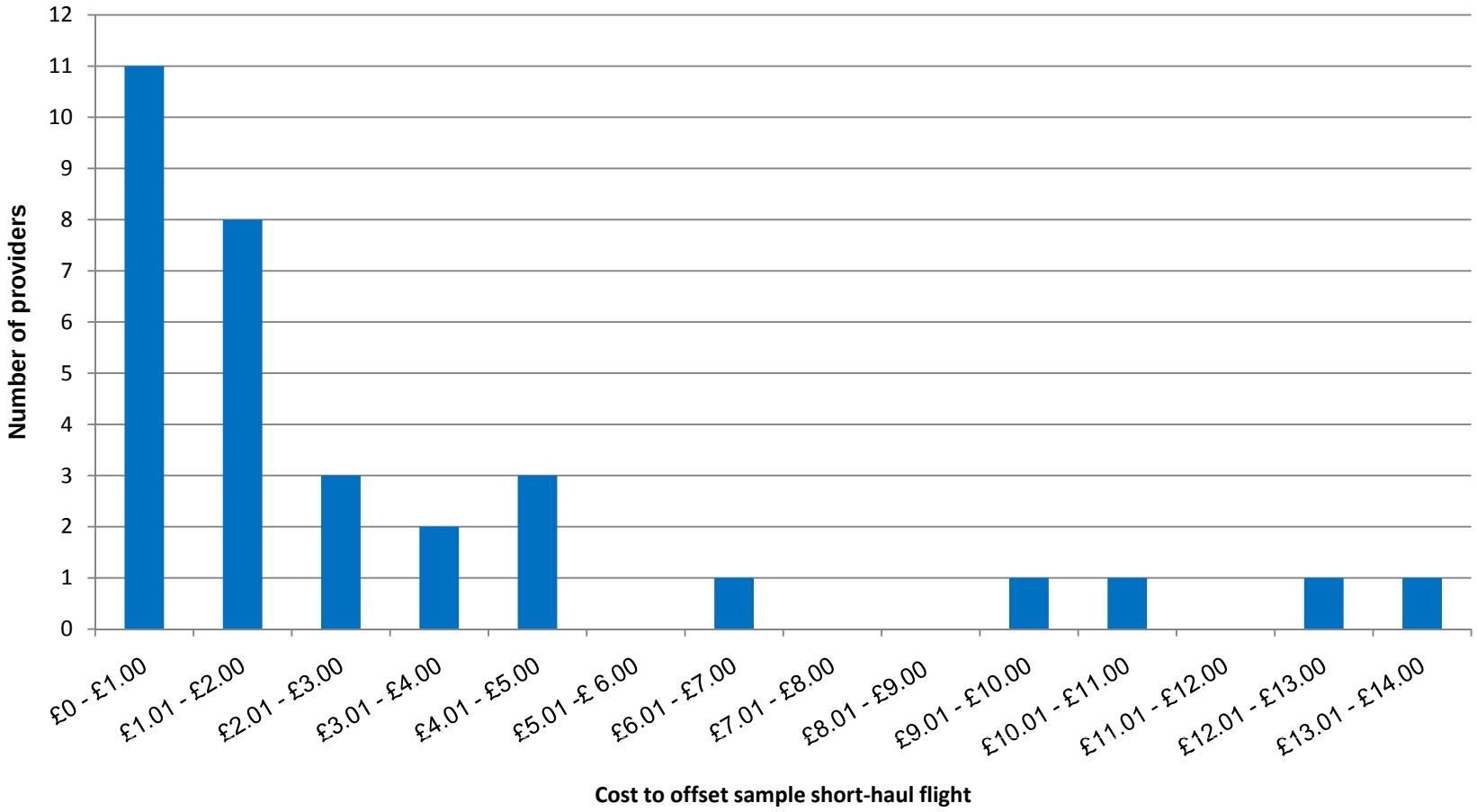
Cost to offset LHR to CDG



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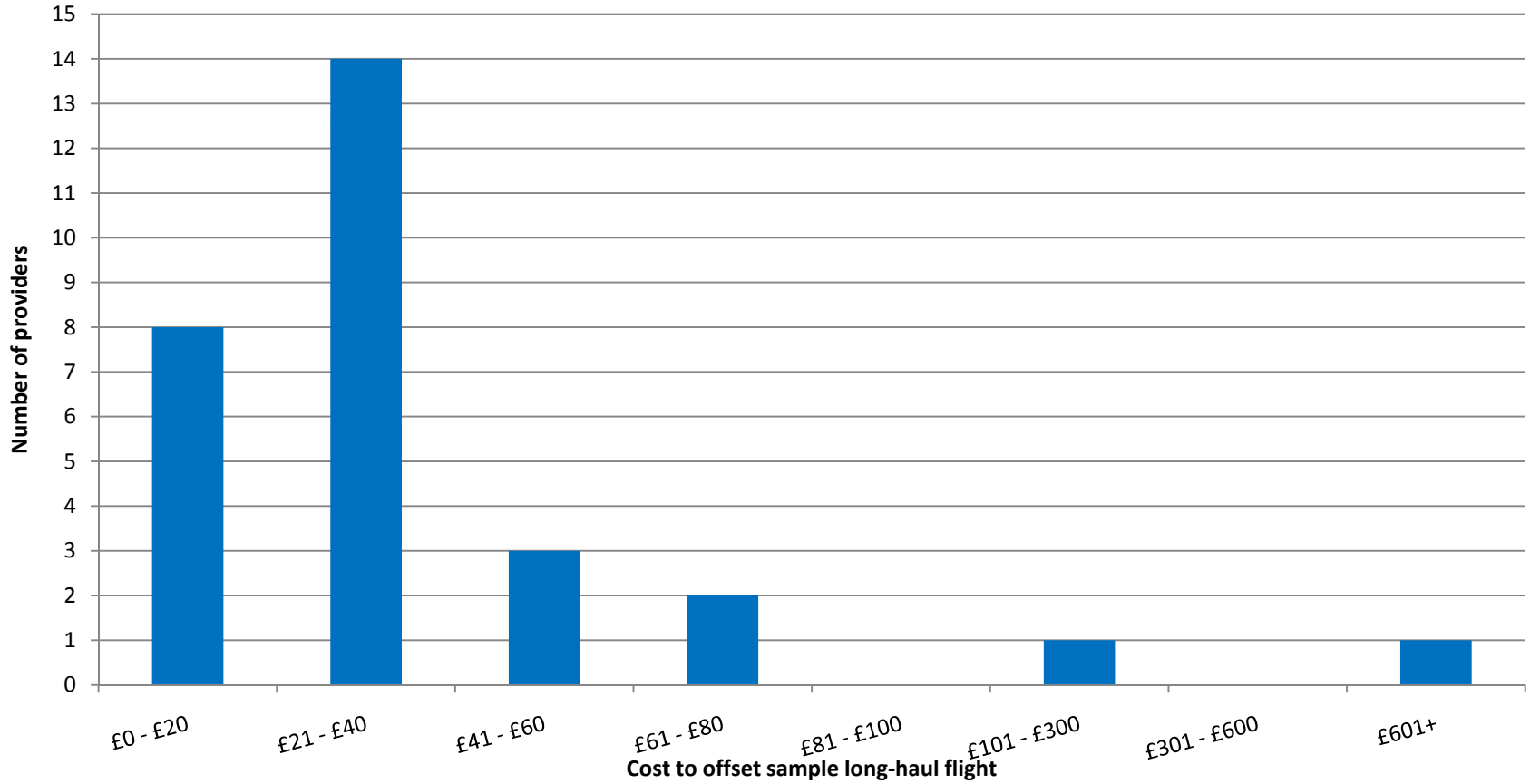
Cost to offset LHR to SYD



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Seating class and offset price

Offset Provider[8]	Cost of offsetting for sample short-haul journey:					
	Economy		Business Class		First Class	
	CO_2 Emissions	*Cost*	CO_2 Emissions	*Cost*	CO_2 Emissions	*Cost*
A	0.07 tonnes	*£4.29*	0.10 tonnes	*£4.29*	n/a	*n/a*
B	0.20 tonnes	*£9.84*	0.30 tonnes	*£9.84*	0.50 tonnes	*£9.84*
C	0.14 tonnes	*£0.99*	0.28 tonnes	*£1.98*	0.42 tonnes	*£2.97*
D	0.10 tonnes	*£1.39*	0.23 tonnes	*£3.13*	0.23 tonnes	*£3.13*
E	0.11 tonnes	*£1.00*	0.16 tonnes	*£2.00*	0.26 tonnes	*£4.00*

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Provider review: Key findings

- Carbon calculators
- Unit price of carbon
- Cost to offset
- Assurance: Mine-field
- Transparency

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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

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Provider review: Key findings

- Carbon calculators
- Unit price of carbon
- Cost to offset
- Assurance
- Transparency: performance inconsistent

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Transparency issues

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

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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_2e to £18/tCO_2) - undermines credibility
- Cost to offset difficult to explain rationally - undermines credibility
- Opportunities to educate and raise awareness under-exploited

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Omega Carbon Offset Study: Passenger Survey

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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

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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**

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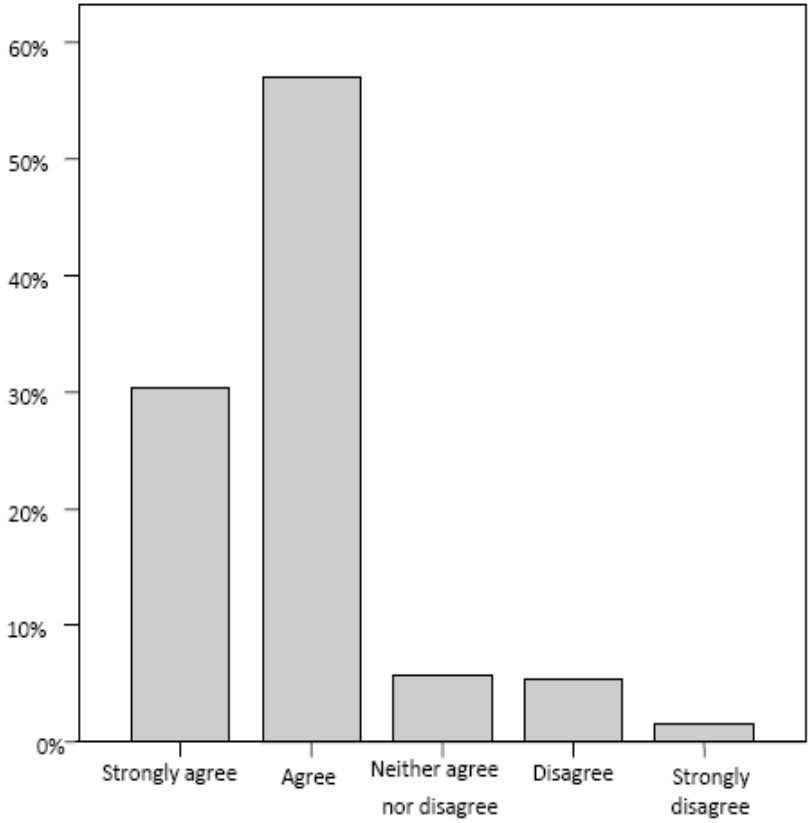
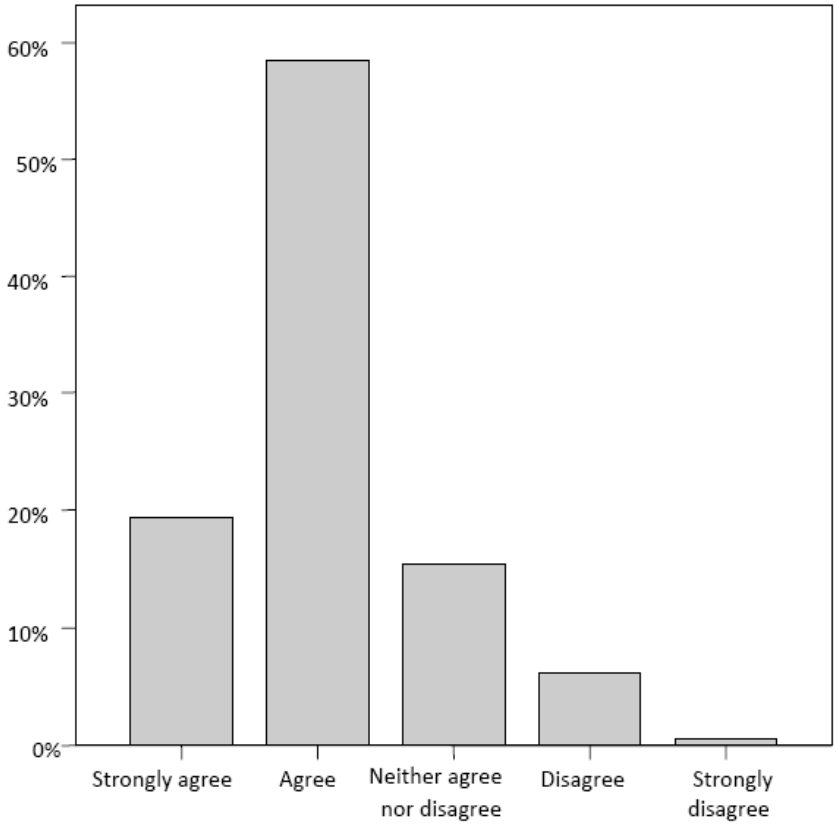
CC a genuine threat



Air travel influence on CC



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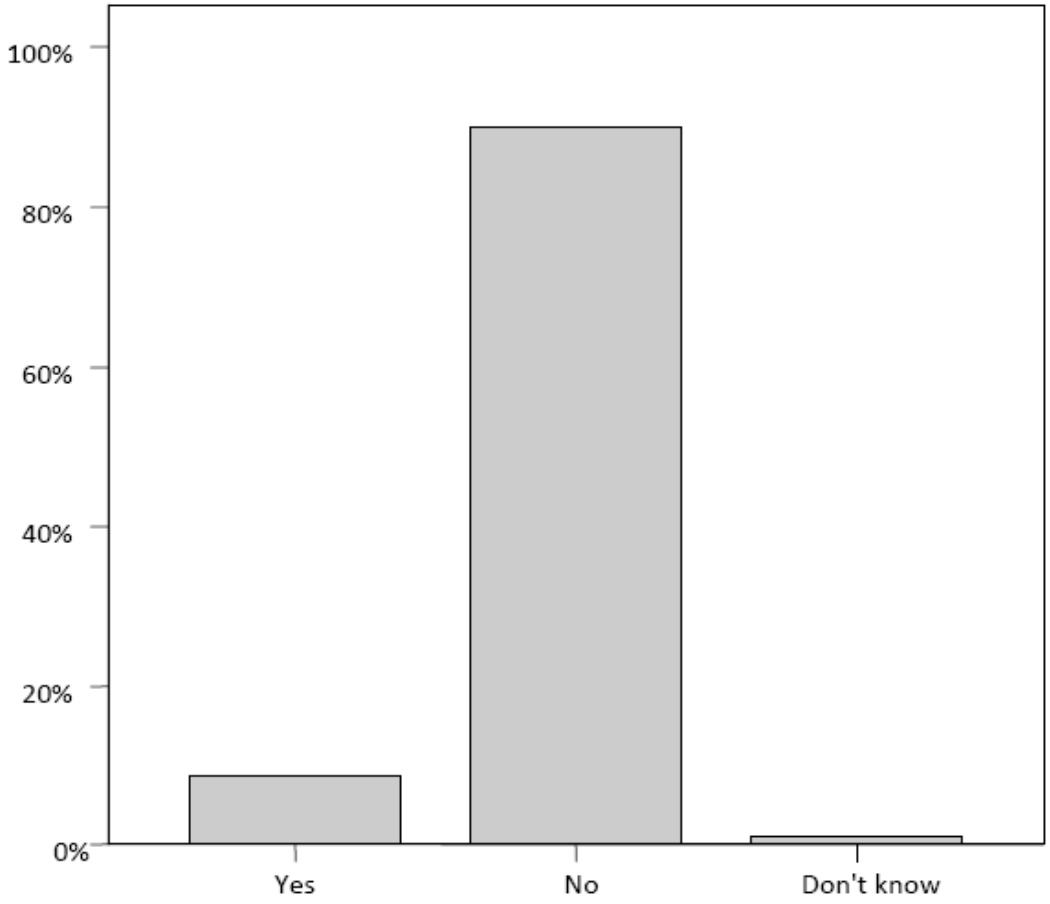
View on CC influences flying choices?



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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**

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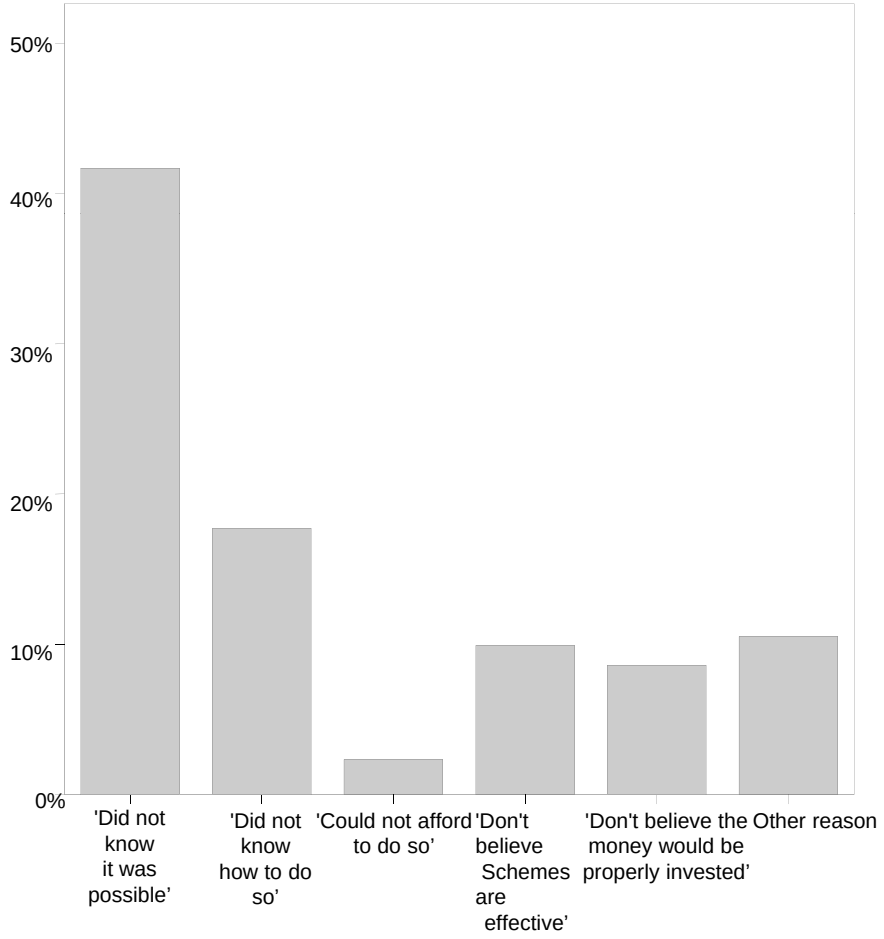
Reasons for not offsetting their flight



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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.

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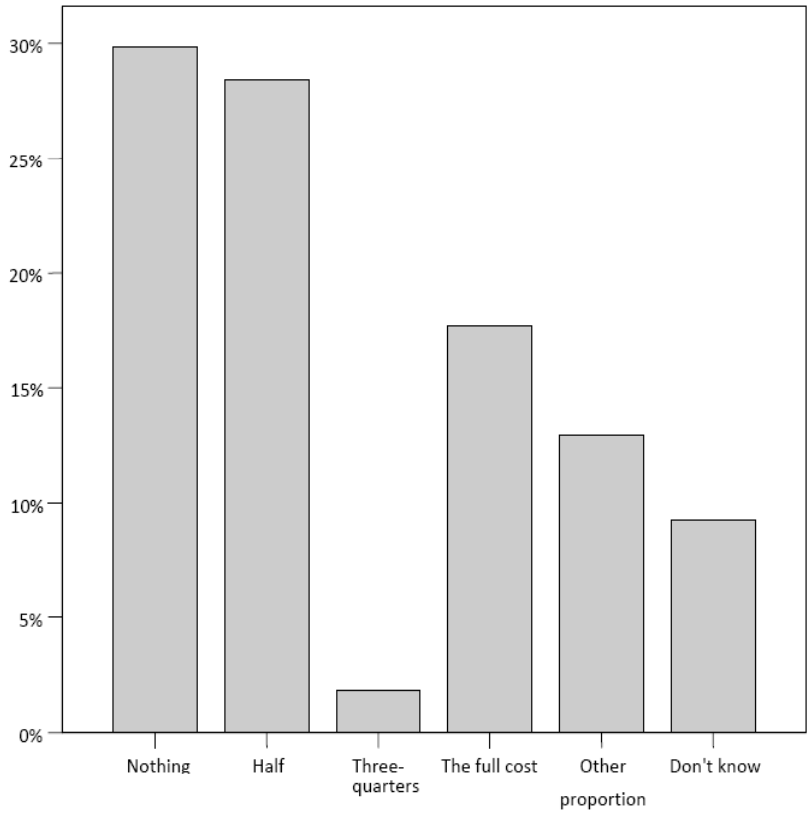
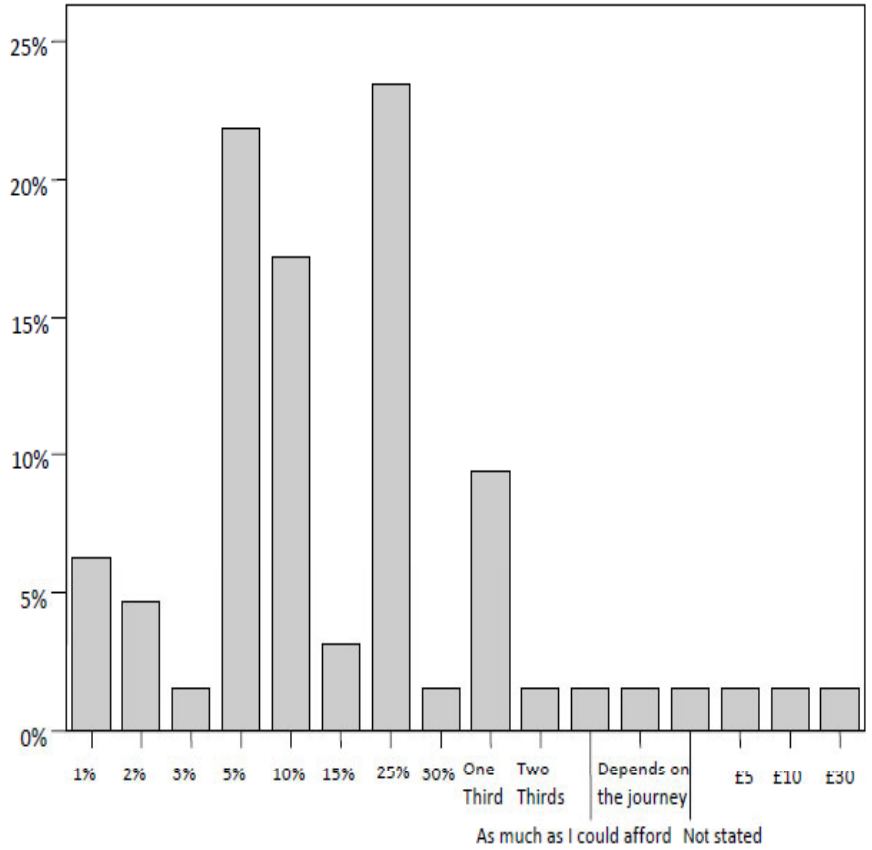
Willingness to pay





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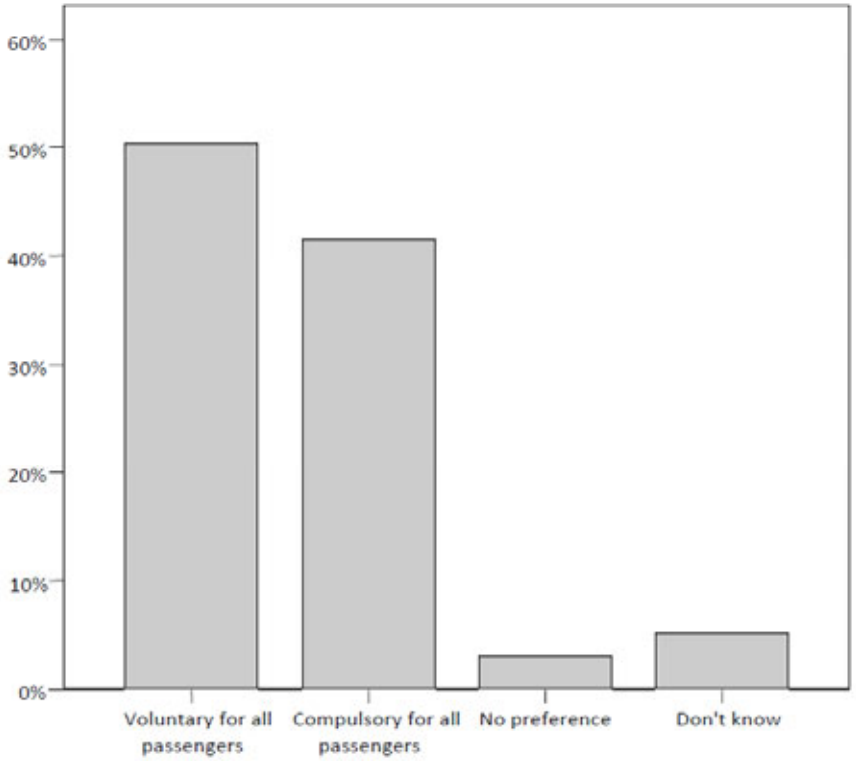
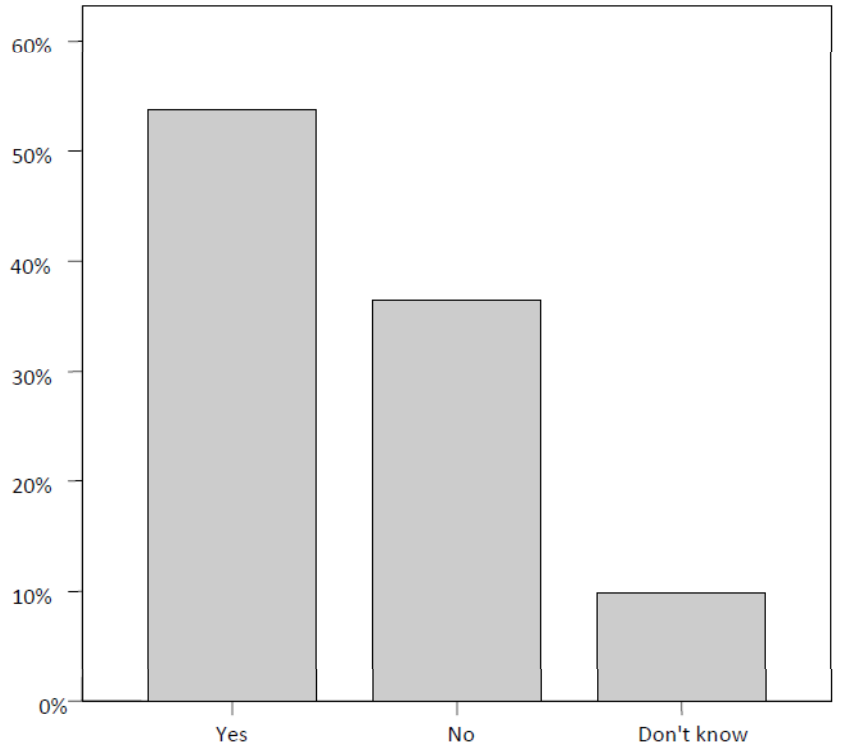
Voluntary for passengers?



Airlines legally required to include offset in ticket price?



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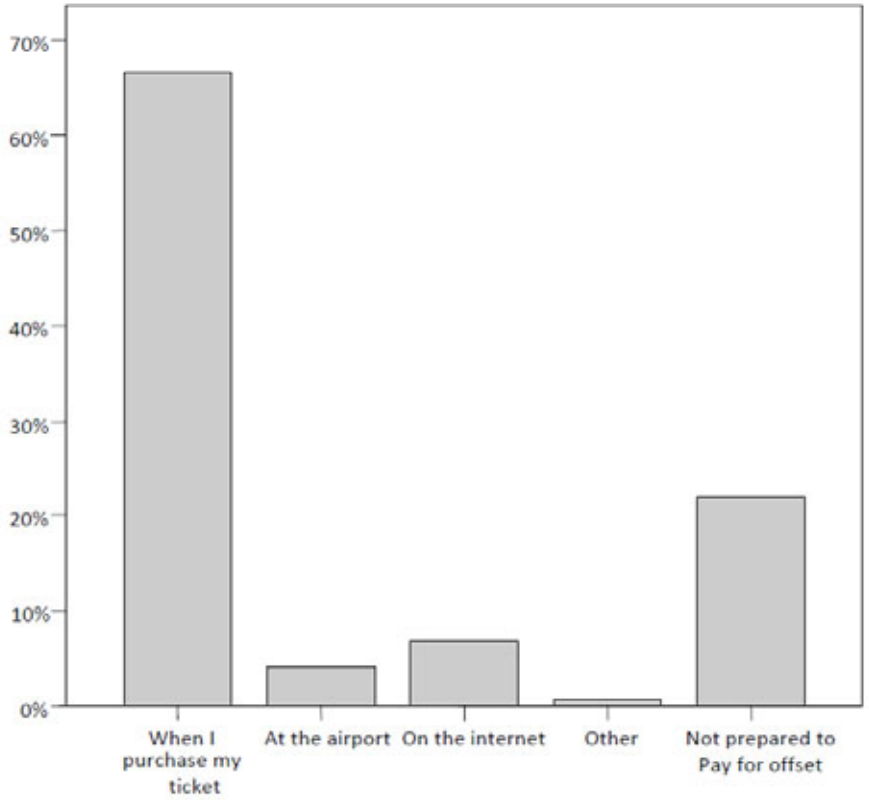
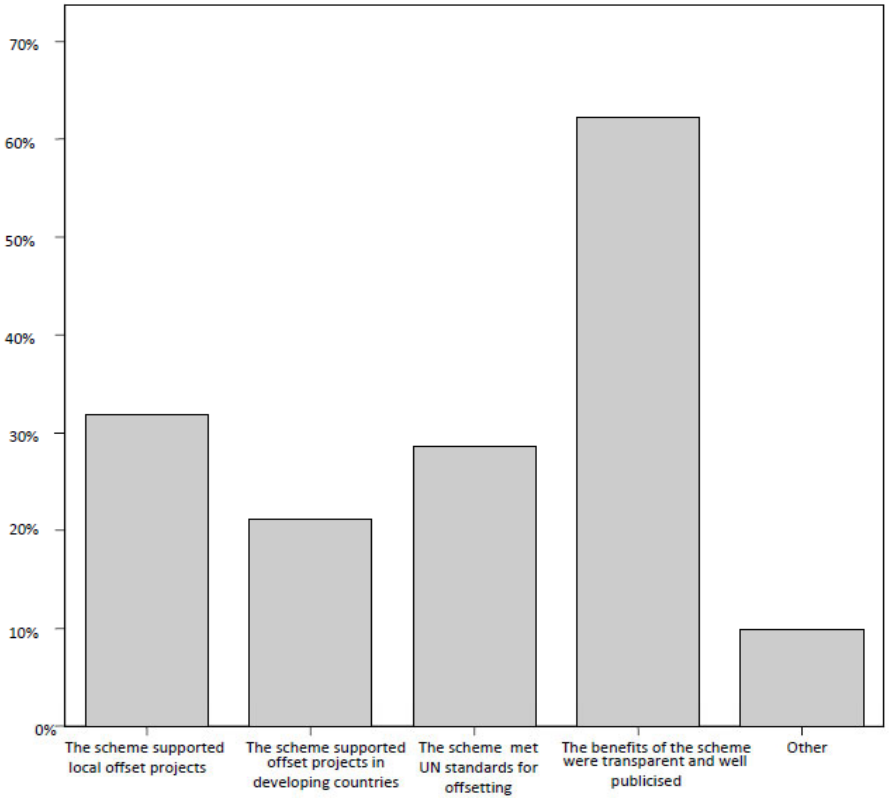
When to pay?



Increased willingness to pay...



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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.

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Overall conclusions

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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

…

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Offset quality key requirements

Verified

Additional

Leakage-free

not **I**mpermanent

not **D**ouble-counted

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...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?