

Voluntary Carbon Offsets in the Airline Industry – A Critical Assessment

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Outline

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Introduction

- The market for voluntary carbon offsets is booming
- 2000: 6 providers; 2007: > 40 providers
- Airlines as diverse as easyJet, Air Canada, Air France/KLM, Continental, Ethiopian, JAL, British Airways, Qantas, Cathay Pacific and SAS offer it to their customers
- European arm of NatJets vowed to become “carbon neutral” by 2012
- SilverJet: first “carbon neutral” airline of the world
- Online travel agencies offer carbon offsets, too... (expedia.com, travelocity.com)
- ... as well as car rental firms (Avis)

Air transport-related measures...

- Efficiency criteria for a rational climate policy are the same as for environmental policy:
 - Static efficiency: Reductions should occur at lowest cost to society
 - i.e. marginal reduction costs should be the same for every polluting activity/in every polluting sector (= equimarginal principle)
 - i.e. transaction costs of every reduction measure must be included
 - Dynamic efficiency: adequate incentives for emission reduction and technological and/or organizational progress
 - i.e. polluters should bear full costs of their activities
 - Ecological effectiveness: policy instrument indeed contributes positively to reach policy objective
 - Redistributional effects: if too high, efficient/effective measures might lose political appeal

Air transport-related measures...

- GHG (not just carbon) reduction – what instruments?
 - Supply-side measures
 - aim to reduce fuel consumption (in absolute terms, not just specific)
 - e.g. GHG-optimized engines, operational procedures, a/c weight reduction etc.
 - strong market-based incentives for airlines due to high oil price
 - e.g. longer-term measures: alternative fuels, fundamental ATC reform (e.g. Single European Sky initiative, free-flight etc.)
 - problems: one-off effect only, often government failure/inaction
 - Demand-side measures
 - aim to reduce demand for air transport to sustainable levels through price and non-price measures
 - e.g. kerosene (and other GHG-related) taxes, tradable permits

Air transport-related measures...

- Demand-side measures (cont'd)
 - Pros and cons of *kerosene (or rather GHG-related) taxes*:
 - standard textbook scenario: works well if demand is elastic
 - but: requires *harmonized international framework* to avoid distortion of competition
 - efficiency (equimarginal principle!) requires *universal application*, i.e. taxes must be levied on all GHG-emitting activities/sectors worldwide, not just air transport
 - demand for air transport not only contingent on price elasticity, but also driven by *high income elasticity* (might override tax-related price increases, see kerosene surcharges!)

Air transport-related measures...

- Demand-side measures (cont'd)
 - Pros and cons of *tradable permits*:
 - Standard textbook scenario: most effective, efficient solution
 - But: requires *harmonized international framework* to avoid distortion of competition
 - efficiency (equimarginal principle!) requires *universal application*, i.e. emission trading scheme must include all GHG-emitting activities/sectors worldwide, not just air transport
 - primary allocation of emission permits is highly politicized
 - grandfathering* = politically preferred approach, but potentially distorts competition

What role for carbon offsets?

- Some key terms:

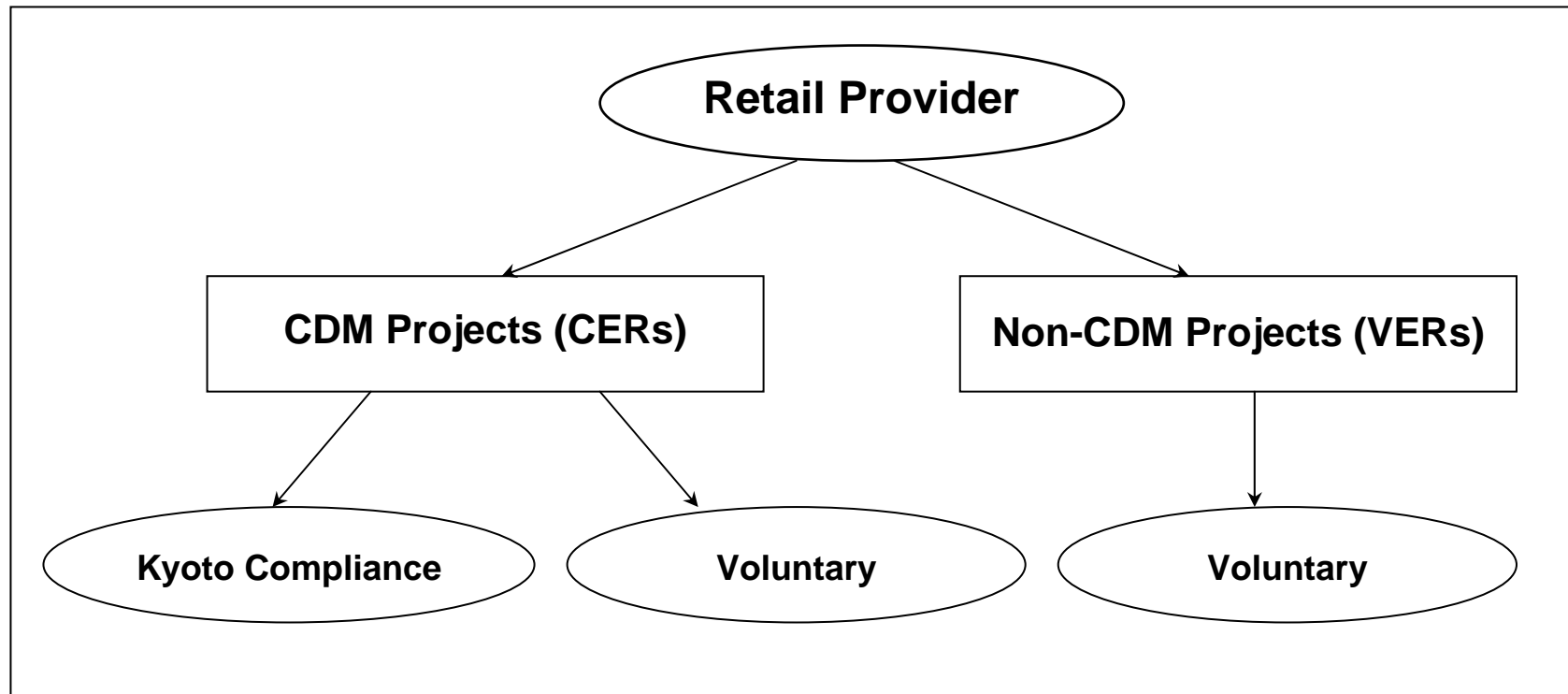
- Carbon footprint = estimated amount of CO₂ emissions of an activity
 - But: should be calculated in CO₂ equivalents only to cover all GHG emissions (i.e. a GHG footprint)
carbon footprint ≠ full environmental impact!
- Carbon sinks = reservoirs, such as forests and oceans, which store more carbon emissions than they release
- Carbon sequestration = process of uptaking and storing carbon
- Carbon offset = counterbalancing equivalent, i.e. act of reducing/avoiding carbon emissions in one place in order to “offset” carbon emissions occurring somewhere else (geographically and/or through other, unrelated activities)
- Carbon neutrality = complete offset of all carbon emissions

What role for carbon offsets?

- The carbon market:
 - 2 segments:
 - Regulated carbon (GHG) market created by Kyoto Protocol
 - cap and trade system of tradable emission permits and credits
 - permits may be created through emissions trading schemes
 - credits may be created (subject to strict rules) through the Clean Development or Joint Implementation Mechanisms
 - major “currencies”: CER, VER, ERU, EAU
 - Voluntary carbon market (= “off-shore” market for emission credits)
 - anybody, from businesses, to NGOs, to individuals can participate in the business of offsetting
 - no governmental regulation, but variety of non-binding private-sector standards/practices for defining/creating credits
 - no “currencies”, i.e. offsets are not fungible

What role for carbon offsets?

The carbon market



What role for carbon offsets?

- The voluntary carbon market
 - Origins: 1989 first voluntary offset by US-based energy supplier in Guatemala
 - Key market data:
 - Number of suppliers > 40, non-profit as well as for profit outfits
 - Best-known firms: Atmosfair, myclimate, ClimateCare, The Carbon Neutral Company
 - Volume in 2006: 20 mio t of CO₂ equivalents
 - Estimated 2010 volume: 400 mio t of CO₂ equivalents (for comparison: CDM credits = 140 mio t p.a., 2 bn t in total)
 - Turnover in 2006: US\$ 125 mio
 - Estimated turnover in 2009: US\$ 260 mio
 - Problem: even if volume of voluntary credits created grows by a factor of 400, these will offset only 10% of all aviation-related GHG emissions

What role for carbon offsets?

- How does offsetting work?
 - Idea: „To neutralize that part of a carbon footprint which has not yet been addressed through direct emissions reductions, the purchase of emissions-free electricity, or Other means“
 - Multi-step approach required to achieve carbon neutrality:
 - Step 1: Quantification of carbon footprint
 - Step 2: Emissions reduction measures at the source
 - Step 3: Calculation of remaining unaccounted-for emissions
 - Step 4: Purchase of sufficient number of carbon offsets
 - Offset options differ substantially among providers
 - Forestry-based offset schemes (“planting trees“)
 - Renewable energy/energy saving offset schemes

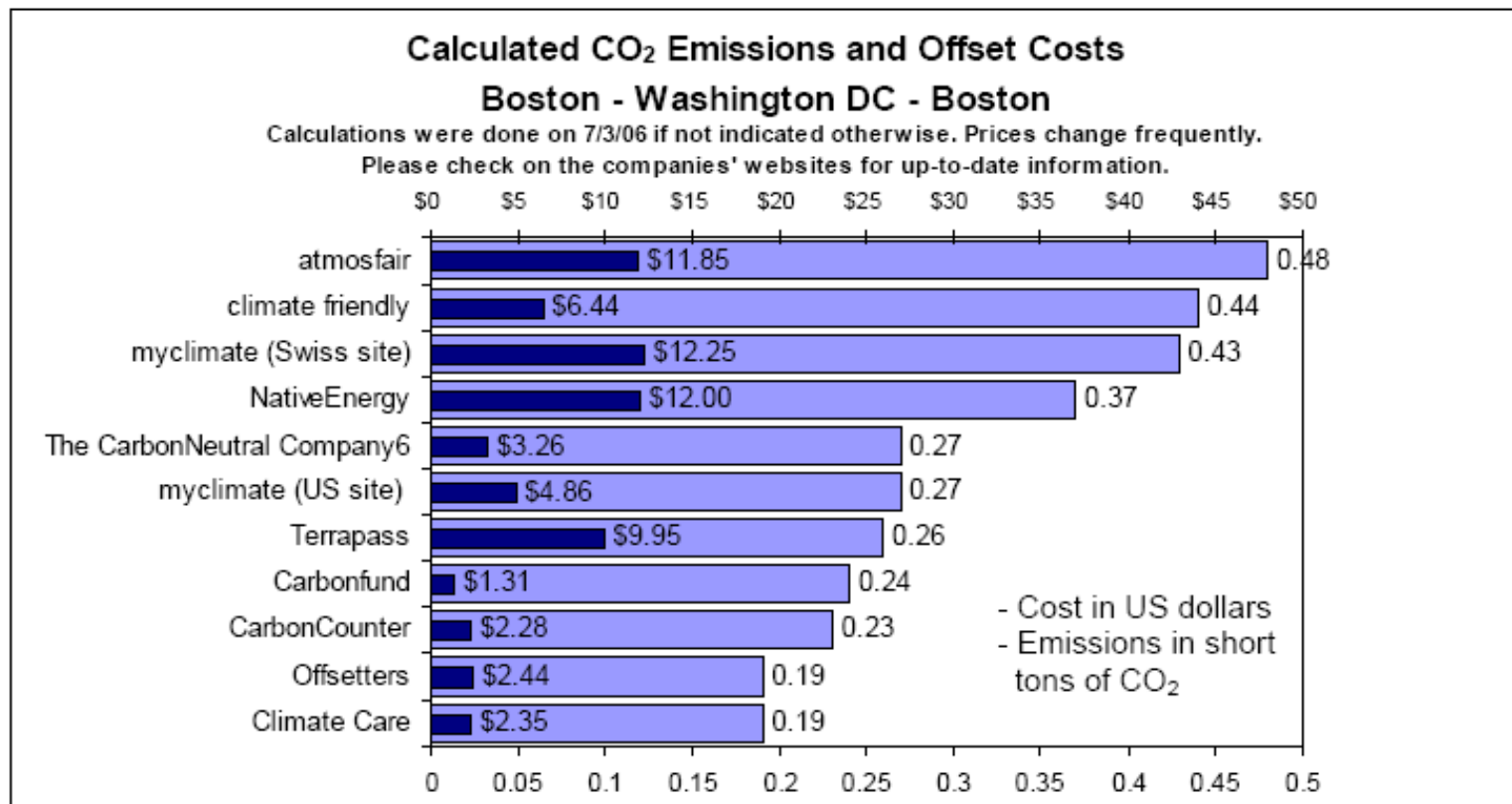
What role for carbon offsets?

- Critical assessment

- There is no generally accepted methodology to calculate individual carbon footprints
 - Extreme differences exist between offset providers for identical itineraries
 - Possible reasons:
 - Large number of determinants, but limited data availability (occupancy rate, type of a/c, age of a/c, cruise speed, cruising altitude, class of travel, weather conditions etc.)
 - Profit maximization strategy by some offset providers (but: no empirical proof so far, similar differences exist among non-profit offsetters)

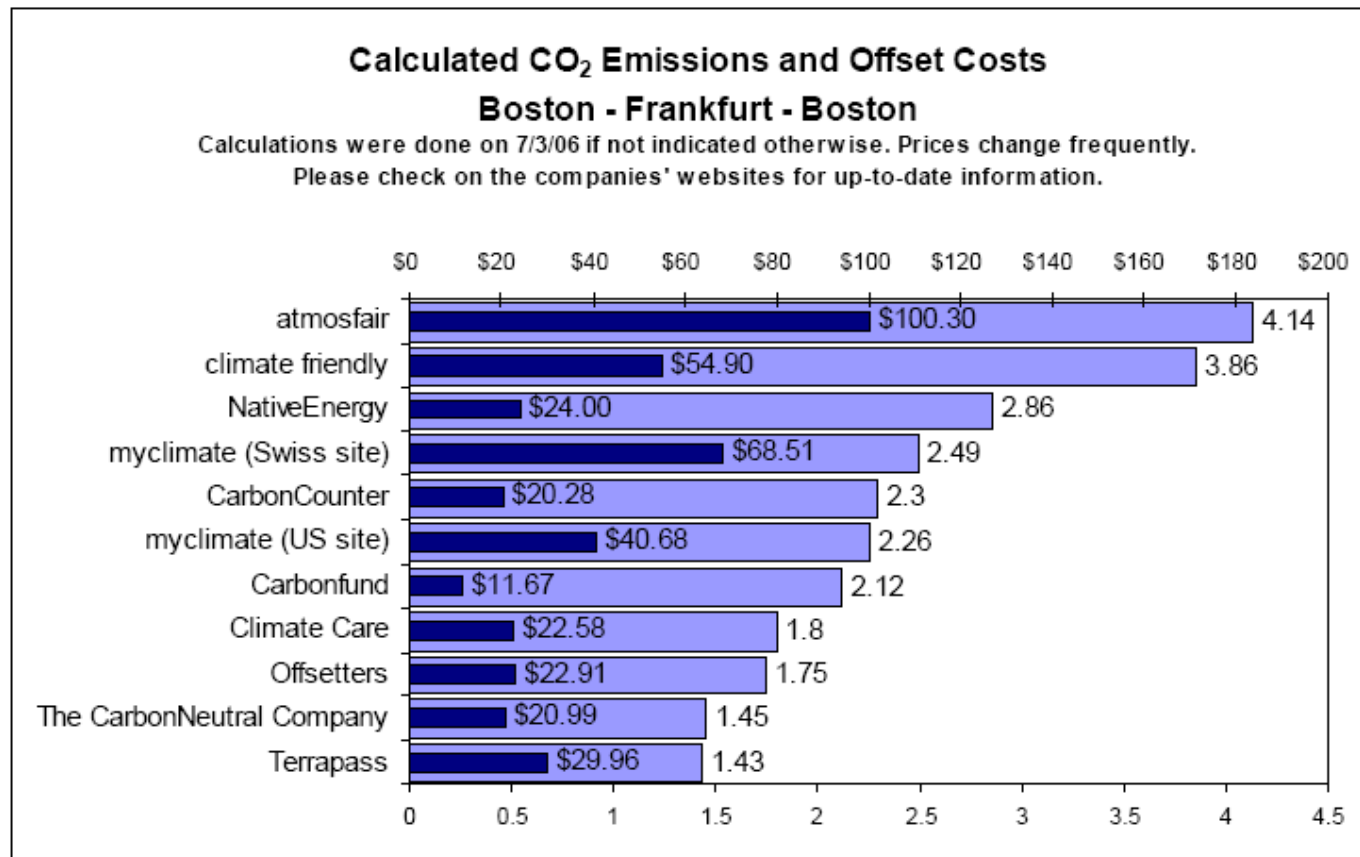
What role for carbon offsets?

Differences in Calculated CO₂ Emissions, Offsets Costs (Short-distance flight)



What role for carbon offsets?

Differences in Calculated CO₂ Emissions, Offsets Costs (Medium-distance flight)



What role for carbon offsets?

- Critical assessment (cont'd)
 - Dubious quality of some offset projects:
 - Three dimensions of quality are relevant:
 - Offset project must be additional (i.e. reduction would not have happened anyway)
 - Carbon must remain sequestered for very long time periods
 - There is no double counting (reduction through offset project must not be counted as a reduction under Kyoto framework)
 - Offset provider's integrity
 - But:
 - No universally accepted quality standards exist, though industry standards are emerging slowly
 - Most offset providers do not provide sufficient/any information on the nature and effects of their projects
 - Share of funds actually used for offset projects varies widely

What role for carbon offsets?

Percentage of funds actually used for offset projects

Company	For or non-profit	% of money to projects
Carbonfund.org	Non	93%
CarbonCounter.org	Non	90%
Atmosfair	Non	80%
Myclimate	Non	80%
Climate friendly	For	66%
Offsetters	Non	65%
Climate Care	For	60%
Cleanairpass	For	25%
The CarbonNeutral Company	For	See footnote ²⁵
Better World Club	For	N/A
NativeEnergy	For	N/A
Solar Electric Light Fund	Non	N/A
TerraPass	For	N/A

What role for carbon offsets?

- Critical assessment (cont'd)
 - Practical implementation problems:
 - Forestry-based offset schemes are estimated to run out of plantation space by 2050 for aviation-related emission offsets alone
 - Forestry-based offset schemes might cause other environmental problems, in particular loss of biodiversity because of monocultures
 - Forestry-based offset schemes might become future carbon sources due to rotting/decomposition)
 - Take-up rate by passenger minimal: BA was able to offset ONLY 0.01% of its emissions in the first year of its scheme (3,000 t out of 27,000,000 t of CO2 emissions)
 - Substitution of flights by other modes of transport or activities will also produce GHG emissions which may be even higher

Conclusion

- Carbon offsets are inefficient and ineffective climate policy instruments and as such inferior vis-à-vis taxes and tradable permits
- Most importantly, they provide
 - no incentive for behavioural change
 - no incentive for technological progress
 - no incentive for operational improvements
- High income elasticity of demand for air travel
 - growth will take place outside USA, EU
 - air cargo grows much faster than passenger traffic
 - both are not covered by offset providers so far
- Attraction for airlines is obvious, though, because they
 - might create eco-friendly (eco-friendlier) image
 - might help airlines to avoid getting getting forced into ETS

Thank you very much for your attention!

