International Aviation Climate Change Fund (IACC Fund)

Abbreviations: IA = International Aviation (excludes domestic), IACC = IA Climate Change

WHAT's NEW / UNIQUE?

A simple, globally scalable solution for international aviation's emissions, significantly more efficient than other proposed schemes; very compelling politically as it delivers quantifiable results rapidly (including a stringent emission cap) and concurrently fulfils the often conflicting goals of three stakeholder groups:

- aviation industry interested in operational and environmental improvements,
- developed countries interested in mitigation of climate change,
- developing countries looking for financial support to adapt to changes already affecting them.

An instrument **addressing customers** that are both **able and willing to pay**!

<table>
<tr><th colspan="2">KEY FEATURES & OUTCOMES</th></tr>
<tr><td>Objectives</td><td>1. Address international aviation's growing climate change impact by charging for emissions and delivering a stringent emission cap.
2. Accelerate aviation emission reductions and provide funding for CC mitigation & adaptation.
3. Provide a viable alternative to current proposals for inclusion of international aviation in European Emission Trading Scheme (EU ETS) and scaling the solution globally.</td></tr>
<tr><td>Market instrument</td><td>Hybrid: Price based (charges per emissions) with quantity constrains (cap on emission).
"Charge & Cap"</td></tr>
<tr><td>Geographical scope</td><td>Worldwide. Emissions from all international aviation (also referred to as emissions from "aviation bunker fuels").</td></tr>
<tr><td>Non-CO_2 impact</td><td>The scheme will cover the non-CO_2 impact, as well as CO_2 emissions[1].
To reflect the non-CO_2 impact a multiplier factor of 2 is used (doubling the aviation climate impact from the CO_2 alone).</td></tr>
<tr><td>Charges
(revenue neutral)</td><td>Paid by airlines for the emission impact (CO_2 and non-CO_2).
Calculated based on the fuel used during the flight (as aviation emissions are directly proportional to fuel used).
Recovered through increased customer charges, set by the airlines (impacted by load factor, fuel efficiency of aircraft, operational excellence etc.; efficient airlines will be able to charge less).</td></tr>
<tr><td>Use of funds raised</td><td>Money collected will be divided into three separate funds to meet three distinct objectives:
Mitigation (including meeting the agreed cap and offsetting emission growth)
Adaptation
Industry improvements (leading to emission/fuel reduction; future mitigation)</td></tr>
<tr><td>Climate change efficiency: Comparison to EU ETS</td><td>
<table>
<tr><th>Result:
Mechanism</th><th>Mitigation</th><th>Adaptation</th><th>Direct industry improvements</th></tr>
<tr><td>EU ETS (aviation), "cap & trade"</td><td>Cap CO_2 at 2004-06 level (Europe)</td><td>Very limited effect (funding possible)</td><td>No effect</td></tr>
<tr><td>IACC Fund, "charge, cap & fund"</td><td>Cap CO_2 at 2004-06 level (globally)</td><td>1/3 of funding dedicated to adaptation</td><td>1/3 of funding dedicated to industry improvements</td></tr>
</table>
</td></tr>
</table>

[1] Aviation's climate impact is greater than the effect of greenhouse gases (GHG) emissions alone due to a number of other substances and indirect effects (nitrogen oxides NOx, sulphate and soot particles, condensation trails).

KEY FEATURES & OUTCOMES *(continued)*

IA emission price

Airlines to pay for a significant percentage of the total climate impact of flight emissions (say 50%). At present a 100% charge is considered overly burdensome, however the 50% level may be increased with time.

The overall climate warming impact of CO_{2e} & non-CO_2 is calculated based on the multiplier of 2.

Unit prices are fixed annually for period of 1 year (based on market forward prices).

Example:

Market price for 1t CO_{2e} for 2009 = €20.

IA unit emission price = €20 *50% * 2 = **€20/tCO_{2e}**

Setting the level initially at 50% has additional advantages; it will:

(a) cover the increase of IA emissions from 1990 to 2009 (making it Kyoto "compatible");

(b) not disrupt the voluntary carbon sector as the passengers could be offsetting the other 50% to be "climate neutral" from their air travel (rather than just be "carbon neutral").

Impact on customer

Ticket price increase is estimated at **2%-3%**:

	Economy		Premium	
Distance	€	% of ticket	€	% of ticket
S (short haul, 420km)	€ 1.3	2%	€ 3.8	2%
M (medium, 1,200km)	€ 2.5	2%	€ 7.5	2%
L (long haul, 5,200km	€ 11.0	3%	€ 33.0	3%

Assumptions: Total emission cost covered by passengers (IACC unit charge: €20/tCO_{2e}; 70% load factor; business customers pay 3 times more than economy ones; 20% of aircraft for business customers). No charges for freight to simplify calculation (fuel data source: CE Delft, 2005).

For comparison the UK Air Passenger duty is several times higher (Feb 2007):

- UK-EU (equivalent to S & M): Economy: £10 (€15), Premium £20 (€30)
- UK - long haul (L): Economy: £40 (€60), Premium £80 (€120)

Quantum of funds raised

First year roll out of the scheme in Europe could raise revenues of €2.8bn.

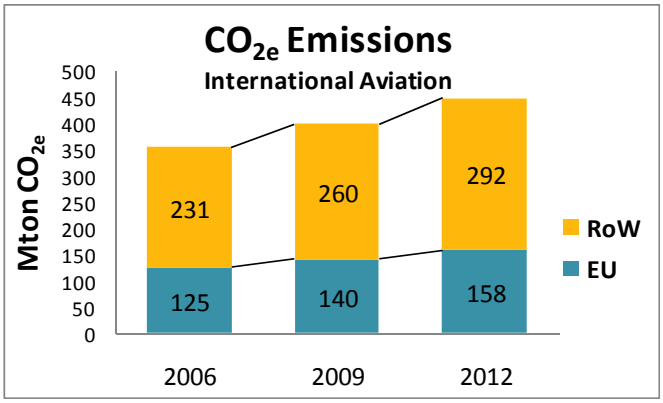
Successful expansion of the IACC Fund on a global scale will result in collection in excess of €8bn per annum. This is significantly above the funds raised under the proposal to include international aviation within EU ETS.

DETAILED ANALYSIS

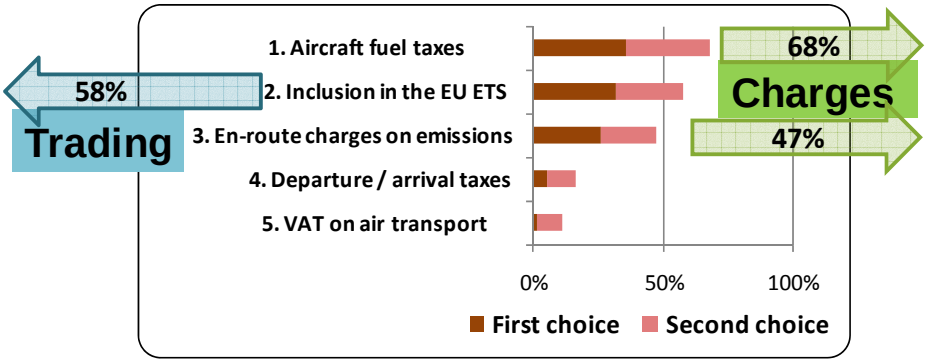
EMISSIONS GROWTH

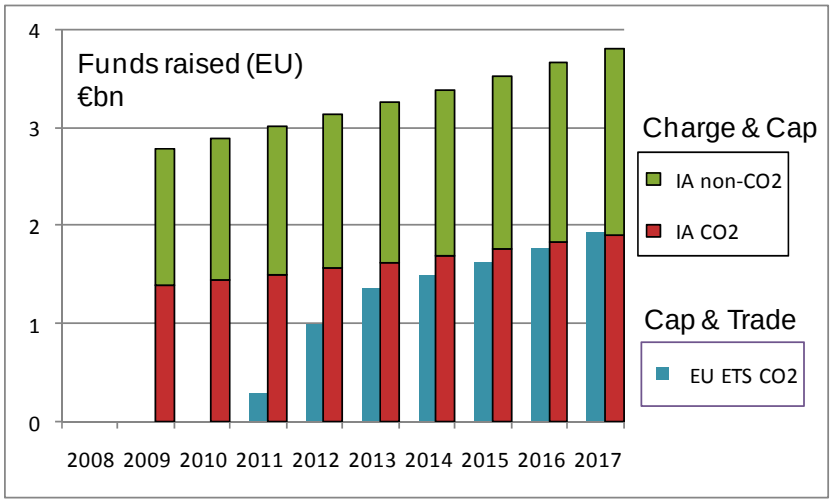
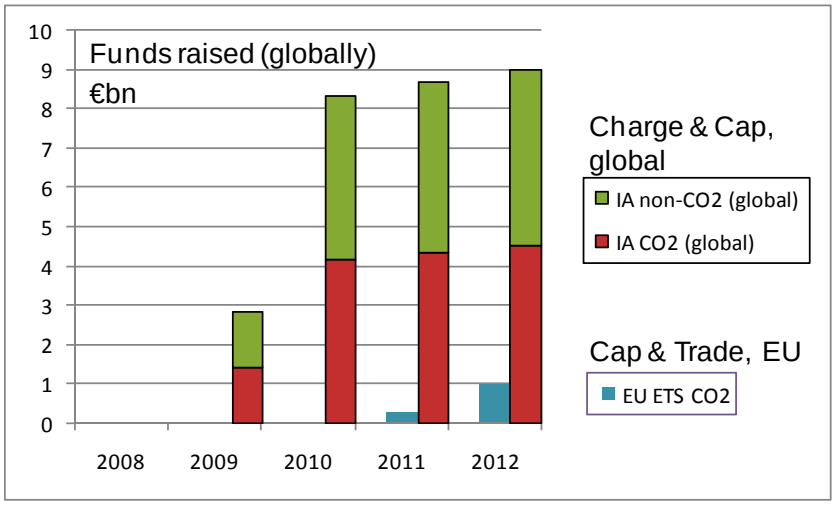
IA Emissions growth & distribution

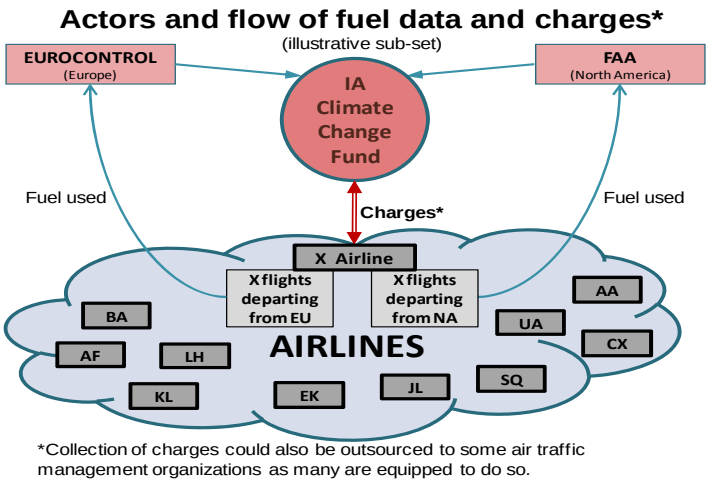
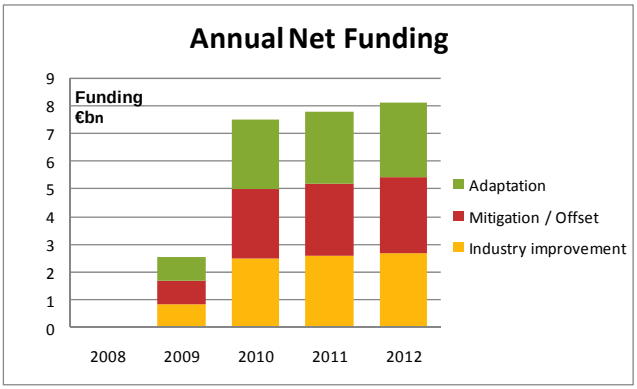
4 % per annum, 35% of IA emissions worldwide is from flights departing from Europe (global annual traffic growth 5.5% minus 1.5% of aviation improvements pa)



Source: 2004 UNFCCC historical data; adjusted with estimates for Russia and non-Annex 1 countries.

POLITICAL AND LEGAL CONTEXT	
Public Acceptability	EU Initial public consultation (2005) results supported both trading and charges options. Greatest support was provided for aircraft fuel taxes/en route charges rather than trading (based on the first and second choices for the preferred market instrument). 
Political Acceptability	Although the current proposal in front of EU favours emissions trading, both ICAO and EU have always seen charges as the main alternative to trading. EC awaits ICAO decision in Sept 2007. EU Parliament has called for a different solution from the one proposed by EC in Dec 2006. Poland separately called for re-consideration of charges and creation of a climate change fund. Adding a stringent cap makes the solution politically very compelling.
Legality (impact of international treaties and agreements)	**Legal** (as per ICAO Assembly Resolution, 2004). Potentially two issues need explicit clarification: 1. Single legal entity to collect charges across the world (outside of the national tax systems) 2. Using collected funds for adaptation. ICAO convention allows collecting charges for CC mitigation ("funds collected should be applied in the first instance to mitigating the environmental impact of aircraft engine emission", ICAO, 2004). Adaptation might need to be added to avoid any doubt that the legislative intention is to address overall CC impact (adaptation terminology came later).
IMPACT	
Environmental Effectiveness - CO_2 and non-CO_2 effects	**EU ETS for international aviation:** Under current proposals, all EU departing international flights (representing 35% of IA emissions) would be part of the EU ETS cap and trade mechanism **from 2012**; intra-EU flights from 2011 (11% of IA CO_{2e}). (EC recently proposed to include also the flights incoming to EU. Due to the legal asymmetry, Chicago Convention etc. it is rather unlikely that both incoming and outgoing international flights could be included in the local/EU cap & trade mechanism.) **IACC Fund:** **EU:** Introduction of IACC Charge in 2009, three years prior to international EU ETS alternative, will provide more immediate emission reduction and revenue streams which can be directed to tackle climate change. **Rest of World:** Extension of IACCC globally in 2010 (one year after introduction in EU) will provide a mechanism to tackle the impact of international aviation globally and provide an additional source of funds. Both outcomes are unlikely to be available under the EU ETS. **Non-CO_2 impact: IACC will levy charges for non-CO_2 impact**, such as NO_x, contrails, and thus more closely capture the environmental costs of aviation. In EU ETS no charge is levied for non CO_2 impact. Under EC proposals, impact of non-CO_2 will be assessed in the future. Cannot be implemented as part of carbon trading mechanism.

IMPACT *(continued)*	
Funds raised <u>annually</u> – EU only	**Substantially greater scope to generate funds than under EU ETS, partly due to inclusion of non-CO_2 effects and earlier adoption.** *Figure: Funds raised by Trading and Charges Mechanisms from European IA*  *Assumptions: Price of 1MtCO_2: €20* *Emission increase: 4% pa (net, after deducting aviation improvements at 1.5% pa)* **Trading** (blue): Assumptions as per EC proposal Dec 2006 (start with intra-EU trading in 2011, expand to all flights leaving Europe in 2012; auction 10% of emission permits by 2012 and 20% from 2013 to 2017; only CO_2) **Charges** (red/green): Assumption that initially only 50% of climate change overall impact is covered by charges (multiplier of 2 used to cover overall aviation emission impact). Scope to raise percentage of CC impact covered in future.
Funds raised <u>annually</u> – **Globally**	**Scalability to Rest of World in second year provides compelling argument that charges are a more effective mechanism to tackle the *global* problem of aviation emissions.** **The revenue raised from global charges is nearly 3 times higher than from European charges alone.** *Figure: Funds raised by Trading and Charges Mechanisms by 2012.*  Projections shown only till 2012 as some other countries are likely to start trading emissions from 2013, in power sector for example. They might potentially include IA in their trading, **if** that were to be the rule by that time.

IMPACT *(continued)*	
Predictability, long-term investment signals	IACC Charge will ensure **high predictability**. Compared with low to moderate predictability for EU ETS, where price is potentially very volatile (quality of emission data poor), an annually set price for emissions will send a strong signal to the market and should result in increased medium to long term predictability. *Fig: Price volatility under EU ETS 2005-2006 (source: Pointcarbon)* 
COLLECTION AND USE OF FUNDS	
Fund collection	The funds raised can be collected by the existing air traffic management (ATM) organizations and contributed to a new supra-national IACC Fund, established under the UN (or collected centrally based on the fuel data supplied through ATMs as shown on the right.) 
Fund usage: adaptation, mitigation and industry improvements.	The IACC Fund will have responsibility for disbursement of monies raised, which will be dedicated to three specific goals: **adaptation, mitigation and aviation industry improvement**. Unlike the auction revenue raised under EU ETS for aviation, funds raised will not go to governments/EU and there will be no hidden costs. The portfolio split might change with time (initially the fund could be split into three equal, independently managed sub-funds).  The operational and management costs will be minimized, and are estimated at 4% on the collection side, and 6% on the management and disbursement side for the three sub-funds. Assuming equal split, each of the three sub-funds (adaptation, mitigation and industry improvements) will receive €2.7bn in 2012 for meeting their respective goals (30% each).

<table>
<tr><th colspan="2">COLLECTION AND USE OF FUNDS (continued)</th></tr>
<tr><td>Fund usage: examples.</td><td>Projects will include:
<table>
<tr><th>Adaptation</th><th>Mitigation / Offset</th><th>Industry Improvement</th></tr>
<tr>
<td>Advance planning for adaptation in developing countries.
Research into new temperature resistant crops.
South – South adaptation transfers.
(Lessons learned from the negotiations and setting up of the Global Environment Facility, GEF are to be reviewed)</td>
<td>Key objective is to mitigate / offset the emission which exceed the pre-agreed emission cap (as per EU ETS).
If the cap were set at the EU proposed level, equal to average emission for 2004-06, the sub-fund will fully cover the offset requirements on annual income until 2014 and overall beyond 2017 (emission reaching a level 30% above the cap in 2012).
The remaining monies, especially in initial years, are invested in reducing emissions through new technologies (like fuel cells for the aircraft auxiliary power units).</td>
<td>Acceleration of the “Single European Sky” initiative through additional infrastructure investments.
Speeding up creation of new, shorter routes over China.
Application of operational best practices.
Industry 10% Emission Challenge and Award.</td>
</tr>
</table></td></tr>
<tr><th colspan="2">OTHER BENEFITS</th></tr>
<tr><td>Cost Effectiveness</td><td>Harmonized emission charge, with portfolio approach for allocation of funds raised ensures cost-effective implementation for IA globally.</td></tr>
<tr><td>Flexibility</td><td>Periodic governance mechanisms allow for adjustment of charges and funding policy to new realities.
Every 3 years (ICAO or similar body) undertake review and potential adjustment of:
• Structure of charges (% of emissions subject to charge – initial 50%, CO_2 and non-CO_2)
• Relative size of sub-funds (initial split: each sub-fund equals to 1/3 of total)
Every year undertake market prices review and setting of the new emission unit charge for airlines.
Decisions valid from the year after next, for 3 years and 1 year, respectively.</td></tr>
<tr><td>Incentives for participation and compliance for airlines & industry</td><td>Reduced fuel through infrastructure investments.
No impact on international competitiveness (assuming global implementation).
Compliance easily verifiable & enforced (via ATM and existing agreements).
Developing country participation encouraged through adaptation policy.
Closing the long-standing debates regarding local taxes & supposedly negative approach of airlines to environment.
Improved industry image.</td></tr>
<tr><td>Similar schemes</td><td>UK air passenger duty
French solidarity tax (on flying out)</td></tr>
</table>