



Turbulences Ahead:

MARKET BASED MEASURES TO REDUCE AVIATION EMISSIONS

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Air travel accounts for 5-14% of global climate emissions and is growing rapidly. Nevertheless, aviation emissions remain unregulated.

Pressure is mounting on the International Civil Aviation Organization (ICAO) to agree to a mechanism to reduce aviation emissions during their next triennial Assembly in September 2013. The aviation sector must reduce its emissions if we are to protect ourselves from severe climate disruption.

ICAO has suggested several options, including several non-market based as well as a global market based measure to reduce emissions in the aviation sector. Any market based solution must go beyond pure offsetting.

Only a cap-and-trade scheme with a stringent cap and a limit on the use of offsets, combined with an ambitious set of technological and operational measures, will deliver actual emission reductions in the sector.

Aviation Sector's Impact on Climate Change

Jet fuel emissions account for 5% of global greenhouse gas (GHG) emissions. On top of that other air travel impacts, such as contrails and cirrus clouds also lead to significant warming¹. Aviation may therefore currently be responsible for up to 14% of man-made climate changeⁱⁱ. Most worryingly, air traffic emissions are rapidly rising at about 4% annuallyⁱⁱⁱ. CO₂ emissions from aviation almost doubled from 1990 to 2006. Left unmitigated, international aviation and shipping emissions could grow by 300-400% by 2050 and take up about 30% of the 2° degree Celsius global emissions budget. The aviation sector must reduce its emissions if we are to achieve the 2° degree Celsius goal.

Aviation and Climate Justice

Aviation emissions pose a particular challenge because it is difficult to allocate emissions to a specific country: should they be allocated to the country where the plane is fuelled, where the plane originates or in the country of destination? In addition to the difficulty of emissions allocation there is the question of fairness and equity: Who should pay for climate protection^{iv}? There is broad agreement that rich and poor nations should not be equally responsible for addressing climate change.

The UNFCCC distinguishes between rich and poor countries: the concept of Common but Differentiated Responsibilities and Respective Capabilities (CBDRRC) stipulates that developed nations have a larger historical responsibility and more capacity to tackle climate change and should thus take the lead in reducing and financing emissions reduction.

However, in the aviation sector developed and developing nations are already competing on an equal footing. Long-haul flights, the source of most aviation emissions, began in the 1970s. ICAO data^v on cumulative international aviation traffic from 1974 to 2009 shows that several airlines from developing countries rank amongst the highest emitters.

Furthermore, aviation users irrespective of the country they come from cannot be considered poor but are rather middle or high income earners. This makes the climate justice argument in the aviation sector difficult and suggests that simply distinguishing between rich and poor countries does not work.



Aviation in the International Climate Negotiations

Under the United Nations Framework Convention on Climate Change (UNFCCC), countries do not have to account for their aviation and shipping emissions. Not even if they have an emission reduction obligation under the Kyoto Protocol, the international climate regime that regulates GHG emissions from all other sectors.

In 1997, the responsibility to reduce aviation emissions was given to the International Civil Aviation Organization (ICAO), a UN body with 191 Member States. The organization was commissioned to develop a suitable climate protection mechanism for its sector. Until now it has failed to do so: neither countries nor companies have to currently account for their aviation and shipping emissions.

Aviation in the EU Emissions Trading Scheme

For several years, the European Union (EU) signalled the intention of addressing aviation emissions unilaterally if ICAO would not take stronger action and commit to a plan to reduce aviation emissions. After slow progress under ICAO to agree on binding targets to reduce aviation emissions, the EU decided that starting from 2012 all flights arriving to and flying from the EU would have to account for their emissions and be included in its cap-and-trade scheme (EU-ETS)^{vi}.

The EU's decision prompted very strong reaction, in particular from China, India and the US. The EU was accused that its unilateral approach would spark a trade war and infringe on national sovereignty. After months of tense negotiations and lawsuits the EU introduced the 'stop the clock' derogation, the partial revocation of the law, which temporarily halts the inclusion of intercontinental flights in the EU-ETS throughout 2013 to allow ICAO member states to agree on a market based measure to limit the growth of international aviation emissions.

The EU stated that a global approach remained the EU's preferred option and that the 'stop the clock' gesture would now create a unique window of opportunity for the ICAO process. The EU also made clear that ICAO would need to agree on an immediate and meaningful framework and a realistic timetable for a global market based measure and an ambitious set of technological and operational measures. The original EU provisions to include international flights in the EU-ETS will again be applied to external flights on 1 January 2014 unless ICAO achieves significant progress.



Global Market Based Measure

Many countries agree that a global MBM should ultimately be developed to replace regional approaches. ICAO has narrowed its options for a global MBM to three approaches:

1. Mandatory offsetting with revenue generation which may be used for additional climate finance
2. Mandatory offsetting without revenue generation
3. A global cap-and-trade scheme

ICAO's Climate Goals

At the last ICAO Assembly in 2010, countries agreed to an aspirational goal of carbon-neutral growth by 2020 (CNG 2020). At this year's ICAO triennial Assembly in September 2013, countries will negotiate several measures that have been proposed to achieve this goal:

1. Non-market "basket of measures" like technological improvements and operational measures;
2. A Framework for market based measures (Framework for MBMs) to provide guidelines and rules to support national, regional or sectoral market based measures;
3. A Global market based measure (Global MBM) which would cover emissions from the whole sector globally.

Non-market "basket of measures"

There is wide agreement, both in ICAO as well as amongst the aviation industry, that a non-market 'basket of measures' which comprises improvements in technology, operations and infrastructure, will be the key to deliver the emission reductions needed towards more sustainable aviation.

ICAO has set itself several goals to implement a range of technological and operational improvements, including a 2% per annum fuel efficiency goal and a global CO₂ standard^{vii}. A recent independent study^{viii} compares the mitigation potential of all mitigation options on the table and finds that although the non-market based measures will be important in the long-term, they will not be sufficient to bridge the emission gap to stay in line with the 2° Celsius climate goal. The study concludes that of all the three types of measures studied, extension of current regional market-based measures (emissions trading) offers the greatest mitigation potential in the short term.

Framework for Market Based Measures

A Framework for market based measures (Framework for MBMs) could serve as an umbrella for national, regional or sectoral initiatives to address international aviation emissions. It would outline the guiding principles and key elements for voluntary implementation of MBMs for CO₂ emissions from international aviation on aircraft registered in other States.

It is important to keep in mind that a Framework for MBMs under which states would be able to cover aviation emissions occurring in sovereign airspace could only account for 22% of the sector's total emissions at most^{ix}.

Many countries agree that such a Framework for MBMs should not stifle the implementation of a global MBM. It is suggested that if a global MBM scheme would be put in place, the Framework for MBMs would cease to apply.

OPPORTUNITY TO FINANCE CLIMATE MITIGATION AND ADAPTATION

Options presented by ICAO include an option for mandatory offsetting with revenue generation which may be used for additional climate finance. The potential to generate revenue for climate financing from mitigation actions in the international aviation and maritime transport sector was also recommended in December 2010 by the High-Level Advisory Group on Climate Change Financing appointed by UN Secretary General Ban Ki-Moon. The report^x suggests that revenue from a global market mechanism could be earmarked for climate change action in developing countries. However, it is unclear whether this option will find support amongst ICAO member states. In a recently adopted Resolution, the International Air Transport Association (IATA) has ruled out^{xi} that revenues from a global MBM should be earmarked for climate finance.

Countries still disagree on how such a global MBM would look like. The International Air Transport Association (IATA), a trade association representing the airline industry, recently declared a preference for a 100% offsetting option. It argues that offsetting is administratively simple and easy to implement.

However, Carbon Market Watch believes that of the options on the table, only a cap-and-trade scheme with a stringent cap and a limit on the use of offsets could lead to emissions reductions in the sector. An option that would allow for 100% offsetting would not lead to emission reductions in the sector itself.

The troubles with offsets

If ICAO decides on a global MBM and allows for 100% offsetting, demand for offsets from the aviation sector could be in the hundreds of millions. The "Low Carbon Economy Index 2012: Aviation" by Price Waterhouse Coopers^{xiv} projects that the aviation sector will create additional demand for carbon offsets amounting to 100 million carbon offsets yearly.

But offsetting is not a long term solution because it does not lead to emissions reductions in the aviation sector itself but merely compensates these emissions throughout investment in reduction projects elsewhere. Because offsetting delays in-sector reduction, it cannot deliver the large long-term emission cuts required to mitigate aviation sector's emissions and projected growth in air-traffic. To make things worse, if the offsets are of low quality, climate impacts actually get worse.

One offset credit represents one tonne of emissions reductions and can be used by entities with emission reduction obligations to compensate for their emissions. It is therefore essential to ensure that every offset credit is "real, permanent, additional and verified." Every credit that does not comply with these principles causes an increase in global emissions. Also, low quality offsets compromise the economic integrity of an offsetting scheme because they artificially inflate supply.

It is still unclear what types of offset credits would be approved for compliance under either a Framework for MBMs or a global MBM.

A large variety of offset credits exist. Only offset credits from the Clean Development Mechanism (CDM) and Joint Implementation (JI) are allowed on the international compliance market. They must comply with a set of international standards. A New Market Mechanism (NMM) is currently being developed under the UNFCCC and could potentially generate additional offset credits. Offset credits are also produced outside the UNFCCC. These include voluntary offset programmes (e.g. Verified Carbon Standard), national offset programmes (e.g. Australia's Carbon Farming Initiative) and bilateral offset mechanisms (e.g. Japan's Bilateral Offset Credit Mechanism). Emission permits could also be acquired in the form of allowances from cap-and-trade schemes, such as European Allowances (EUAs) from the European Emissions Trading Scheme (EU ETS). The table on the below shows that in the absence of quality restrictions airlines favour cheap offset credits originating from low quality projects. Putting in place quality restrictions for such offsets is absolutely vital. Below is a summary of main offset credit types and recommended quality provisions:

OFFSETS USED BY AIRLINES IN 2012

Despite the 'stop the clock' derogation, compliance with the EU ETS for 2012 remained mandatory for flights operating within the EU. This means that, for example, an Indian carrier operating a flight from Strasbourg to London would still have to comply with the EU ETS. The EU ETS places a limit of 15% on the use of international offsets on aircraft operators. Under this limit, the maximum aggregate number of offsets allowed for the 1188 airlines covered by the EU ETS in 2012 was 12.5 million offsets.

In May 2013, the European Commission released for the first time data on carbon offsets used by airline operators to comply with their EU ETS targetsⁱⁱⁱ. The data shows a 98% compliance rate for airlines included in the EU ETS. Airlines that did not comply included two Indian carriers, eight Chinese carriers, one American airline, one Russian and one airline from Pakistan.

Below some key facts of offsets used by airlines in 2012:

- Airlines used 11 million offset credits almost equally spread between the CDM (5.6 million) and JI (5.3 million);
- Ten largest aircraft operatorsⁱⁱⁱⁱ used 5.12 million offset credits (3.4 million CERs and 1.7 million ERUs);
- These offsets originate from 44 CDM projects and 16 JI projects;
- More than 1 million CERs come from 9 HFC-23 destruction projects, credits meanwhile been banned from the EU ETS over their lack of environmental integrity;
- Easyjet, Lufthansa and Air France bought 420.000 CERs from three N2O adipic acid projects in China and South Korea, equally banned for similar reasons;
- Lufthansa bought the largest junk of credits (650.000 ERUs) from a JI track 1 project that claims to have reduced Associated Petroleum Gas between 2007 and 2011 at the Priobskoe oil field, one of the largest oil fields in the world;
- HFC-23 projects were the largest originators of CERs: 400.000 and 380.000 CERs originating from Chinese HFC-23 projects were sold to Easyjet and British Airways respectively;
- The biggest emitters amongst airline operators in 2012 were Ryanair and Lufthansa;
- In total, Ryanair purchased 1.1 million CERs from seven N2O reduction plants, four HFC-23 plants and three wind parks;
- Lufthansa purchased 740.000 credits from three track 1 JI projects in Russia and Ukraine and from one N2O adipic acid project in China.

Clean Development Mechanism (CDM): CDM offset credits are called Certified Emission Reduction (CER) and are approved under the UNFCCC. CERs are issued for projects that reduce emissions in developing countries. Despite international oversight, an independent study commissioned by the CDM Policy Dialogue in 2012 has found that potentially two thirds of all CDM credits expected between 2013 and 2020 could come from business-as-usual projects and therefore cause an increase in GHG emissions of up to 3.6 billion tonnes if used for compliance. Also industrial gas projects have sold millions of CERs that do not represent real emission reductions. This has led the European Union, Australia and New Zealand to ban industrial gas credits from their national emissions trading schemes. **Recommendation: Quality restrictions should be placed on CDM offset credits to ensure that only CERs that come from projects with high environmental quality could be used for compliance under an ICAO scheme.**

Joint Implementation (JI): JI offset credits or Emission Reduction Units (ERUs) are issued for projects that reduce emissions in developed countries that have signed the Kyoto Protocol. JI has been repeatedly criticised for a severe lack of quality control. 95% of all ERUs issued to date are issued by host countries without international oversight. Despite the on-going reform it is unlikely that JI projects post 2012 will be of significantly better quality. **Recommendation: Offset credits from JI should not be eligible under an ICAO scheme.**

New Market Mechanism (NMM): A new offsetting mechanism was approved in 2011 and is currently being developed under the UNFCCC framework. It will likely take many years until emission reduction units will be issued under this new mechanism. **Recommendation: NMM credits should only be eligible under an ICAO scheme if they are verified to be real, permanent and additional.**

Voluntary offset programmes: There are a variety of voluntary offset programmes currently operating. Offsets from such voluntary schemes are often of low quality due to limited or no regulatory oversight. **Recommendation: Offset credits from the voluntary market should not be eligible under an ICAO scheme**

Bilateral offset mechanisms: Several countries are developing bilateral offsetting schemes without oversight of the UNFCCC. Due to the lack of international oversight the quality of bilateral offset credits cannot be evaluated. **Recommendation: Offset credits from bilateral offsetting mechanisms should not be eligible under an ICAO scheme.**

Allowances from cap-and-trade systems: Emission permits could also be acquired in the form of allowances from cap-and-trade schemes, such as European Allowances (EUAs) from the European Emissions Trading Scheme (EU ETS). Cap-and-trade systems only lead to emissions reductions if there is a scarcity of allowances. The two biggest emissions trading schemes are severely oversupplied. The EU ETS and International Emissions Trading (ET) under the Kyoto Protocol are oversupplied with 2 and 13 billion allowances respectively. These two systems therefore do not lead to new emissions reductions. **Recommendation: Surplus allowances from over-supplied schemes such as the EU-ETS or ET should not be eligible under an ICAO scheme.**

i. For more information, see: <http://www.co2offsetresearch.org/aviation/AviationImpacts.html>
 ii. Lee et al., 2009 'Aviation and global climate change in the 21st century' <http://elib.dlr.de/59761/1/lee.pdf>
 iii. Solomon et al. 2007 'Climate Change 2007: The Physical Science Basis', Cambridge University Press
 iv. For an overview on equity principles, see: CAN Fair Effort Sharing Discussion Paper at <http://www.climate-network.org/publication/can-discussion-paper-fair-effort-sharing-jul-2011>
 v. ICAO Programme Of Action On International Aviation and Climate Change http://legacy.icao.int/icao/en/env2010/Pubs/EnvReport2010/ICAO_EnvReport10-Intro_en.pdf
 vi. EU Directive 2008/101/EC amending Directive 2003/87/EC to include aviation activities <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:008:0003:0003:EN:PDF>
 vii. ICAO Programme Of Action On International Aviation and Climate Change http://legacy.icao.int/icao/en/env2010/Pubs/EnvReport2010/ICAO_EnvReport10-Intro_en.pdf
 viii. Lee et al., 2013 'Bridging the aviation CO2 emissions gap: why emissions trading is needed', http://www.cate.mmu.ac.uk/wp-content/uploads/Bridging_the_aviation_emissions_gap_010313.pdf
 ix. Lee et al., 2013 'Bridging the aviation CO2 emissions gap: why emissions trading is needed', http://www.cate.mmu.ac.uk/wp-content/uploads/Bridging_the_aviation_emissions_gap_010313.pdf
 x. Report of the Secretary - General's High-level Advisory Group on climate change financing http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/AGF%20Report.pdf
 xi. IATA Press Release No. 34 of 3 June 2013 <http://ht.ly/IEbhp>
 xii. http://ec.europa.eu/clima/policies/ets/registry/documentation_en.htm
 xiii. Air France, Deutsche Lufthansa AG, KLM, Scandinavian Airlines System, Air Berlin, Alitalia, British Airways, Easyjet, Ryanair Limited, Thomson Airways Limited
 xiv. PwC 2012, 'Low Carbon Economy Index 2012: Aviation', <http://www.ukmediacentre.pwc.com/imagelibrary/downloadMedia.ashx?MediaDetailsID=2243>



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