

International Policy & Strategy Briefing

An Airline's Guide to Climate Action in the Aviation Sector Preparing for Various Policy Futures

Jointly prepared by IETA, Climate Connect and Baker & McKenzie

Introduction

The aviation sector is a relatively small contributor to global GHG emissions, with a share in 2009 of approximately 1.5% of total anthropogenic emissions worldwide.¹ However, the share of aviation emissions, without concerted efforts by policymakers and industry actors, will grow by as much as four times the current levels by 2050.

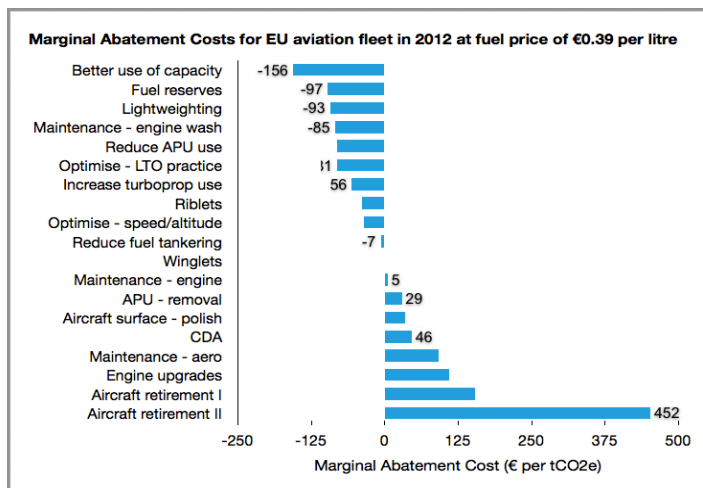
There have been policy actions taken seeking to lower the emissions trajectory for the aviation sector. Most notably, the European Union Aviation Directive covers flights both within Europe and arriving or departing from European airports. This measure has caused controversy and threats of retaliations from other countries. Australia has also put a price on the emissions from domestic flights.

These actions have occurred against a backdrop of international negotiations around the development of an agreement to reduce emissions in the aviation sector. The core of these negotiations is the construction of a Market Based Mechanism (MBM) to allow airlines to reduce their emissions flexibly.

Carbon markets and aviation are getting closer and closer. For this reason, Baker and McKenzie, Climate Connect, and IETA have created this briefing to provide core information on the aviation sector and policy developments within the national and international spheres.

The Aviation Sector

❖ Marginal Abatement Cost of Various Abatement Options



Source: Cranfield University, UK. The study, "A Framework for Estimating the Marginal Costs of Environmental Abatement for the Aviation Sector"

Marginal Abatement Costs (MAC) provide the menu of options available to airlines and aircraft manufacturers to reduce their emissions. Importantly, it projects the approximate cost of implementation to achieve each ton of reductions. These costs are dependent on a number of variables, especially fuel prices, so they can only provide a rough estimate of relative costs. Under a scheme such as emissions trading, airlines can examine and implement the most cost effective measures for their particular circumstances.

The figure demonstrates relative costs at a fuel price of €0.39 per litre. It is important to note that some measures have a negative cost per tonne of CO₂ reduced, because implementing the measures will both reduce emissions and increase profitability at the same time.

❖ Compliance Options Using Various Technologies

Aircraft operators have a wide range of technologies and options to reduce greenhouse emissions. Three main categories of technologies and measures are available to aircraft operators:

- (1) Airframe and Engine technologies can be updated, such as replacing parts or an entire engine within an existing airframe to increase efficiency. This also includes blending fuel with biofuels to reduce emissions.
- (2) There are also operational improvements such as direct routing of flights and speed-altitude optimization that lower fuel used for flights.
- (3) Finally, airlines can alter fleet management practices, by shortening maintenance intervals or using more turboprop planes for short haul flights, which yield emissions savings

¹ http://www.c2es.org/docUploads/Aviation_0.pdf

❖ Long-term trends for combining growth in air traffic with airline goals for carbon neutral growth

Various scenarios of air traffic and carbon emissions growth rates
(2008 to 2025)

Regions	Annual growth in RTK (%)	Annual growth in emissions (%)	Annual growth in emissions (%)	Annual growth in emissions (%)
		Scenario A	Scenario B	Scenario C
North & Central America	3.0	-0.6	-0.3	-1.0
Europe	3.9	2.2	2.3	2.1
Latin America	5.0	2.2	2.4	2.1
Russia & CIS	4.9	-2.2	-1.6	-2.8
Africa	6.7	1.7	2.1	1.3
Middle East	4.5	-0.3	0.1	-0.8
Asia & Oceania	6.9	5.2	5.3	5.0
China	8.2	6.1	6.3	5.9
World	4.7	1.9	2.2	1.7
Scenario A	IMF GDP growth rates - Heterogeneous energy gains			
Scenario B	IMF GDP growth rates - Low energy gains			
Scenario C	IMF GDP growth rates - High energy gains			

The growth in the aviation sector is clearly dependent on the rate of economic recovery around the world. As various regions of the world have been affected with a varied degree of economic slowdown, the rate of growth has also varied accordingly. As the Table shows, there is regional variation in anticipated emissions growth for CO₂ emissions as we move forward to 2025 and beyond. Asia, in particular, is expecting strong annual growth ranging from 5% or above. This regional variation means that any international agreement must strike a balance between facilitating growth in air traffic in emerging markets and reducing the sector's global emissions trajectory.

Source: Cheze, B., Chevallier, J., Gastineau, P., 2012. Will technological progress be sufficient to effectively lead the air transport to a sustainable development in the mid-term (2025)? Climate Economics Chair, Paris-Dauphine University

❖ Current Use of Voluntary Offsets by Airlines for Cost-effective Reduction

A number of airlines across the world have proactively implemented voluntary carbon offset programs. According to the International Air Transport Association (IATA), over 30 airlines run offset programs with different methodologies for calculating emissions and different criteria for offset projects.

Additionally, 19 airlines are part of IATA's Carbon Offset Program. Some of the airlines practicing in voluntary carbon offsetting and their recent updates involving purchase of offsets are listed below.

AIRLINE	MEASURE/UPDATE
Qantas	Launched voluntary carbon offset program which was later certified under the Australian Government's National Carbon Offset Standard. Purchases offsets from Australian projects and projects under the Verified Carbon Standard (VCS)
British Airways	Operates the One Destination Carbon Fund which supports projects under the UK Carbon Reduction Framework
Kenya Airways	Operates a voluntary carbon offset program under the IATA Carbon Offset Program
Lufthansa	Launched voluntary carbon offset program in partnership with Swiss non-profit organisation myclimate
Cathay Pacific and Dragon Air	Operates a voluntary carbon offset program that purchases offsets from renewable energy projects in China
Etihad Airways	Signed an agreement with Masdar to purchase offsets from bioenergy projects

Regional Policy Drivers

❖ Inclusion of the aviation sector in the EU ETS

In light of the slow progress made internationally for addressing emission reductions in the aviation sector, the Commission decided in 2008 to include aviation in the scope of the EU-ETS from 2012 onwards unless sufficient progress was reached at the international level in ICAO. The European Commission favours a global approach to tackling emissions in the aviation sector, but wants to avoid a situation where slow international progress is used as an excuse for not reducing emissions. In January 2009, the controversial Aviation Emissions Directive² was adopted, bringing the airline industry squarely within the scope of the EU Emissions Trading System ("EU ETS").³

The inclusion of aircraft operators within the ETS system has not been smooth. The most contentious aspect is that it is designed to apply equally to both EU and foreign aircraft operators in respect of all flights arriving at or departing from EU airports, whether international or intra-EU, a fact which was subject to legal challenge before the European Court of Justice (ECJ). The Air Transport Association of America and various U.S. airlines challenged the UK's Aviation Greenhouse Gas Emissions Trading Scheme Regulations⁴, arguing that the application of the EU ETS to foreign based operators breached customary international law - namely the principal of exclusive sovereignty over airspace through the ex-territorial application of EU law - and international agreements (e.g., the Kyoto protocol, the Chicago Convention and the EU-US Open Skies Agreement).

In February 2012, the EU Court handed down its judgment, which concluded that the EU Aviation Directive was lawful and did not infringe international law obligations.⁵ The European Commission argues that inclusion of the aviation sector in the EU-ETS Directive is non-discriminatory as it treats all airlines equally regardless of which country the aircraft belongs to.

This judgment precipitated an increasingly fractious political stalemate, culminating in the signing into law by US President Barack Obama of the "EU ETS Prohibition Act"⁶ on 3 December 2012, which gave US regulators the power to effectively ban US airlines from complying with the ETS.

Current status of the 'stop the clock' proposal for international flights

In view of the intense political pressure the EU was coming under due to the inclusion of international flights in the scope of the EU-ETS, and in view of ICAO's next triennial General Assembly in September 2013, where there are expectations that progress could be achieved, the Commission proposed to "stop the clock" and defer the obligations set out in its legislation. This proposal, which was adopted by the European Parliament and the European Member States, entered into force on 24 April 2013 with immediate effect. It corresponds to a one-year derogation from the obligations to comply with the requirement to report verified emissions for 2010, 2011 and 2012, and the corresponding surrender of allowances for 2012 emissions, for international flights, i.e. in or out of one of the 30 countries affected by the EU-ETS. Intra-European flights do not benefit from this exception, and at the end of April 2013, any airline operator operating domestic European flights had to surrender the allowances relating to domestic emissions from 2012, whether or not such flights were operated by a European or foreign aircraft.

This one-year derogation affects those aircraft operators operating international flights and who have either not received any free allowances or have returned them within a month after implementation of the decision. If no credible alternative international solution is proposed by the ICAO at this meeting, the EU ETS will, in principal, reapply to all aircraft operators as from 1 January 2014 (unless it is extended or replaced with a new legal amendment), meaning that they will have to account for their 2013 emissions by the end of April 2014 and so on, year by year.

Any change to the basic EU-ETS legislation needs to be approved through co-decision, which means all 754 MEPs and 27 (soon to be 28) Member States will need to approve any new legislative change the European Commission proposes if it decides to extend the exception. In today's political context, this makes gaining sufficient support for a further derogation unlikely. The 'Stop the Clock' decision was quickly adopted, with little political opposition. The main reason for this is because the derogation was presented as a time-limited exception, to avoid the EU blocking progress at the international level as a result of its own legislation. With the 'Stop the Clock' now in place, Europe is now expecting other parties in ICAO to propose a way forward to avoid the political battle re-emerging after the next ICAO Assembly in September.

Trends in Primary and Secondary Aviation Emissions Permits Markets

In the primary market, only two instances of auctions of EUAAs have been recorded to date. The first auction took place at the European Energy Exchange (EEX) on 31 October 2012. The exchange auctioned 2.5 million EUAAs (Aviation EU

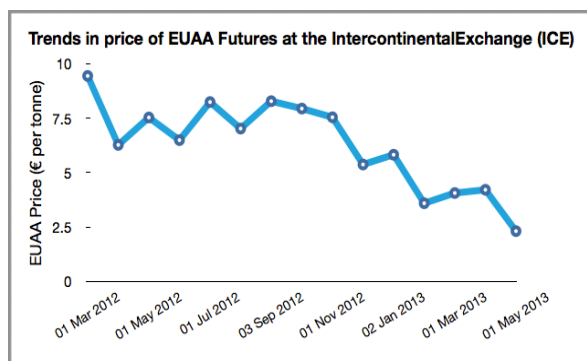
² Directive 2008/101/EC amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community [2009] O.J. L. 8/3 ("Aviation Emissions Directive").

³ Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community [2003] OJ L 275/32 (as amended by Directive 2004/101/EC, Directive 2008/101/EC, Regulation 219/2009 and Directive 2009/29/EC.)

⁴ S.I. No. 1996 of 2010.

⁵ In Case C-366/10, *Air Transport Association of America & others v Secretary of State* (reference for a preliminary ruling), judgment delivered 21 December 2011 (not yet reported).

⁶ Thune-McCaskill European Union Emissions Trading Scheme (EU ETS) Prohibition Act (S. 1956).



allowances) on behalf of Germany at €7.01 per tonne. All exchange-based auctions were suspended following the announcement by the European Commission on 12 November 2012 to postpone the inclusion of international flights in the EU ETS aviation scheme. The second auction was administered by Vertis Environmental Finance on 09 April 2013. The online auction was oversubscribed 3.21 times and 230,208 EUAAs were cleared at €4.84 per tonne.

On the secondary market, monthly futures contracts of EUAAs are currently being traded at the Intercontinental Exchange (ICE). There was a substantial fall (see graph) in prices following the European Commission's announcement of temporarily suspending the inclusion

of non-EU airlines under the EU ETS in November 2012. The EUAA price has also closely followed the price trends in EUAs. In 2012, 1.45 million EUAAs were traded on the ICE while in 2013, so far, 230,000 EUAAs have been traded.

Australia's CPM

❖ Current Impact on Airlines under Australia's Carbon Pricing Mechanism

Leading domestic airlines in Australia – Qantas, Virgin Australia, and Jetstar – are currently not directly liable under the Carbon Pricing Mechanism. However, these airlines will face an indirect financial impact as the government increases the excise duty on domestic aviation fuel by an amount equivalent to the carbon price on an annual basis between 2012-13 and 2014-15⁷.

Before the implementation of the carbon tax, the excise duty on aviation kerosene was 3.556 cents per litre. With the introduction of the carbon tax the excise duty increased to 9.536 cents per litre in 2012-13. The excise duty will further increase to 10.16 cents per litre in 2014-15.

Airlines have already defined the impacts of their carbon financing efforts. For example, Qantas estimates that the total impact of the CPM in 2012-13 will amount to A\$75.7 million⁸. The airline reported that it witnessed increased expenses of A\$55 million⁹, or 10% of its total expenses, due to carbon tax between June and December 2012. These expenses include the investment made to strike a deal with RM Williams Holdings to purchase 1.5 million carbon offsets under the Carbon Farming Initiative (CFI). The ability to purchase CFI credits will offset part of the costs to airlines by purchasing a cheaper abatement instead of reducing emissions internally.

As airlines typically have international operations, the domestic legislation has bottom-line implications for companies who compete in multiple markets. It is also a patchwork approach that creates inconsistencies in pricing and an increased burden on international airlines to comply with multiple programs. Finding a global, joined up response through the International Civil Aviation Organisation (ICAO) would help to ease these competitive impacts.

International Developments

❖ Milestones in the ICAO negotiations

At its last General Assembly in 2010, ICAO endorsed the global aspirational goal of a 2% annual fuel efficiency improvement up to the year 2050. They agreed on the development of a framework for market-based measures with the objective to develop a global scheme for international aviation, and will finalise the outstanding details at the next GA in 2013.

In 2012, the High Level Group on International Aviation and Climate Change (HGCC) was formed to evaluate the feasibility of a global market-based measure and the development of a framework to guide the general application of any proposed MBM.

The HGCC met three times since it was set up, and has discussed a variety of measures. Its role is to provide guidance on specific questions relating to a global MBM and the framework for that MBM.

The HGCC is now discussing three market-based mechanisms:

1. a carbon emissions offset program
2. a carbon emissions offset program with an additional revenue mechanism. Such an offsetting system would require airlines to pay into a central fund that would purchase carbon offsets
3. a global carbon emissions cap-and-trade system, which would allocate emission allowances equivalent to the tonnes of CO₂ an airline operator is allowed to emit

⁷ Clean Energy Future, 2012. *Transport Fuels*. [Online] Available at <http://www.cleanenergyfuture.gov.au/transport-fuels/> [Accessed 21 May 2013]

⁸ Climate Connect Limited, 2012. *Qantas announces domestic carbon surcharge of \$2-\$7*. [Online] Available at <http://www.climate-connect.co.uk/Home/?q=node/1837> [Accessed 21 May 2013]

⁹ Climate Connect Limited, 2013. *Qantas Airways reports A\$55 million carbon tax impact during first six months*. [Online] Available at <http://www.climate-connect.co.uk/Home/?q=Qantas%20Airways%20reports%20A%2455%20million%20carbon%20tax%20impact%20during%20first%20six%20months%20> [Accessed 21 May 2013]

The first option on a carbon emissions offset program is reportedly the most likely option. IATA also recently indicated this was the airline association's preferred option. No further meetings of the High-Level working groups are scheduled before ICAO's next General Assembly, which means that quite a few outstanding issues still need to be resolved in the GA.

From the EU perspective, an agreement in ICAO on market-based measures must include three key elements¹⁰:

- It must deliver aviation emission reductions at least as big as the EU ETS is doing;
- It must be non-discriminatory for all airlines;
- It must contain targets and measures for ICAO member countries.

At its 69th Annual General Meeting, the International Air Transport Association (IATA) adopted a resolution on the "Implementation of the Aviation Carbon-Neutral Growth (CNG2020) Strategy." The strategy aims at establishing a global market-based mechanism involving an offsetting scheme starting in 2020.

❖ Outstanding and divisive issues in ICAO

One of the most divisive outstanding issues concerns the principle of common but differentiated responsibilities between developed and developing countries, and whether countries should be contributing differently to emission reductions for the aviation sector.

ICAO remains divided on key points of principle such as market-based-mechanisms, although a growing number of countries including China are beginning to introduce aviation emissions trading initiatives.

There is no consensus in the HGCC about what consequences would arise if ICAO members agreed on a MBM framework and whether this would mean that ICAO States would be signalling their de facto support for regional MBMs, or whether bilateral agreements would still be needed to recognise regional schemes.

There is also no consensus on what the purpose of setting up a framework would be: would it be to harmonise existing MBMs in view of having one global market-based-mechanism, or to set minimum requirements for various MBM to put in place?

There is no agreement on the geographic scope of the framework for MBM, and whether emissions should be counted based on (option a) all departing flights from a state, (option b) all international flights carried out by operators registered in a given state, or (option c) all flights within a state's sovereign airspace, or (option d) Flight Information Regions (FIR). Most ICAO members prefer the sovereign airspace option and some favour the nationality of the carrier criteria. The EU and Australia favour the 'departing flights' criteria.

The Costs of Delayed Action

The table shows the estimated cost to the global aviation sector of achieving carbon neutral growth from 2020 to 2040. The supply needed to 2040 includes domestic and international aviation and is based on recent analysis by ATAG up to 2030 and extrapolated to 2040. The global supply of allowances and credits for each category are based on independent analysis by Bloomberg New Energy Finance.

	Supply needed 2020 to 2040 (MtCO2)	Price (\$/tCO2 real)		Cost (\$m) of meeting 2020-2040 shortfall through a single purchase in	
		2013	2020	2013	2020
		UNFCCC Credits	2,330	2 ⁽²⁾	10
Voluntary	360	5	8	\$ 1,800	\$ 2,880
EU ETS	1,700	4 ⁽²⁾	30	\$ 6,800	\$ 51,000
Others	230	10	10	\$ 2,300	\$ 2,300
Total	4,620			\$ 15,560	\$79,480 ⁽¹⁾

(1). In practice the aviation industry would try to find cheaper offset alternatives than EU ETS in 2020, but it would make sense to acquire EUAs in the short term while prices are low

(2). Assuming the current price is a simplification. Purchase all of the surplus of CERs and EUAs would increase the price of EUAs. But the key point is still valid – the price of credits will get more expensive as surpluses are used and rules tightened that more closely reflect the marginal cost of abatement in each market.

Source: Bloomberg New Energy Finance

The prices shown in 2013 are approximate averages in each of the markets in the current year. Prices in 2020 are based on BNEF calculations and estimates. In practice, if these emission rights were to be bought by the aviation industry, the market prices would be higher than shown in both 2013 and 2020. However, the fundamental point remains that underlying prices of these emissions will be higher in 2020 than today. It will therefore be cheaper for the aviation industry to meet its goal of carbon neutral growth from 2020 by securing rights to the current surplus of emission credits, than to wait until 2020 when other sources of demand will be competing for the same volume of emissions.

¹⁰ http://ec.europa.eu/clima/policies/transport/aviation/index_en.htm

Conclusion

❖ Recommendations for EU airline companies

So what is the way forward for aircraft operators? The political situation in Brussels suggests that the rules will re-apply automatically, and if a proposal for a derogation is made, this is likely to face strong political opposition by European co-legislators who helped define what 'sufficient progress' in ICAO should represent, to justify wavering the EU-ETS obligations. For this reason, we would recommend aircraft operators to expect the rules to re-apply and to continue monitoring the 2013 emissions, in order to avoid a situation in April 2014 where emissions haven't been reported and allowances can therefore not be surrendered to match the correct level of allowances.

Assuming that the derogation will simply continue to apply fails to recognise the political reality of the debate. If the 'Stop the Clock' derogation fails to stimulate progress at the international level and instead is focused on actors assuming the exception will continue, this risks undermining the reason why the Commission originally proposed the exception to the rules, and could worsen the situation of political hostility rather than focussing on finding the most practical solution internationally.

❖ Recommendations for the airline industry globally

Major outstanding questions remain to be discussed and agreed upon at ICAO's next General Assembly. It looks rather unlikely that the progress, which the EU is expecting in order to review its legislation, will be achieved in ICAO.

Over the short-term, we encourage ICAO to consider implementing a combination of sector-wide emission trading measures with the use of offsets. Until the time that aviation technology allows cost-effective mitigation, airlines could reduce emissions by purchasing emissions reductions from a diverse range of registered projects. The development of sector-wide emission trading, combined with offsets and the use of biofuels and other technological developments, offers the best medium to long-term solution for the aviation industry.

About IETA

The International Emissions Trading Association (IETA) is a non-profit business organization created in June 1999 to serve businesses engaged in the new field of carbon markets. IETA is the collective voice for the full range of businesses involved in carbon markets - all around the world. Our objective is to build international policy and market frameworks for reducing greenhouse gases at low cost.

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About Climate Connect

Based in London and New Delhi, Climate Connect Limited, incorporated in 2010, is an Online Media & Analytics company specializing in energy environment markets. Our areas of focus include renewable, carbon, sustainability and energy efficiency. Accredited by the UNFCCC, it runs a portfolio of popular websites like NEWS.climate-connect.com, TERMINAL.climate-connect.com and CaliforniaCarbon.info

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