



Committee on Aviation Environmental Protection (CAEP) – Topic 1

Director – Vincent Correia

Reduction of greenhouse gases emissions produced by aviation: Addressing the compatibility of international and regional instruments

1. Introduction

Climate change became one of the most challenging environmental issues of our time, since its negative effects “*are already being felt on every continent*”.¹ On December 12, 2015, States have adopted the *Paris Climate Agreement* with the ambition to keep global temperature rise to below 2°C by the end of the Century. However, while emissions reductions from domestic aviation are governed by this agreement, emissions from international aviation are excluded.

The International Civil Aviation Organization [ICAO] is working on the issue of emissions from international civil aviation.

2. The Contribution of Aviation to Climate Change

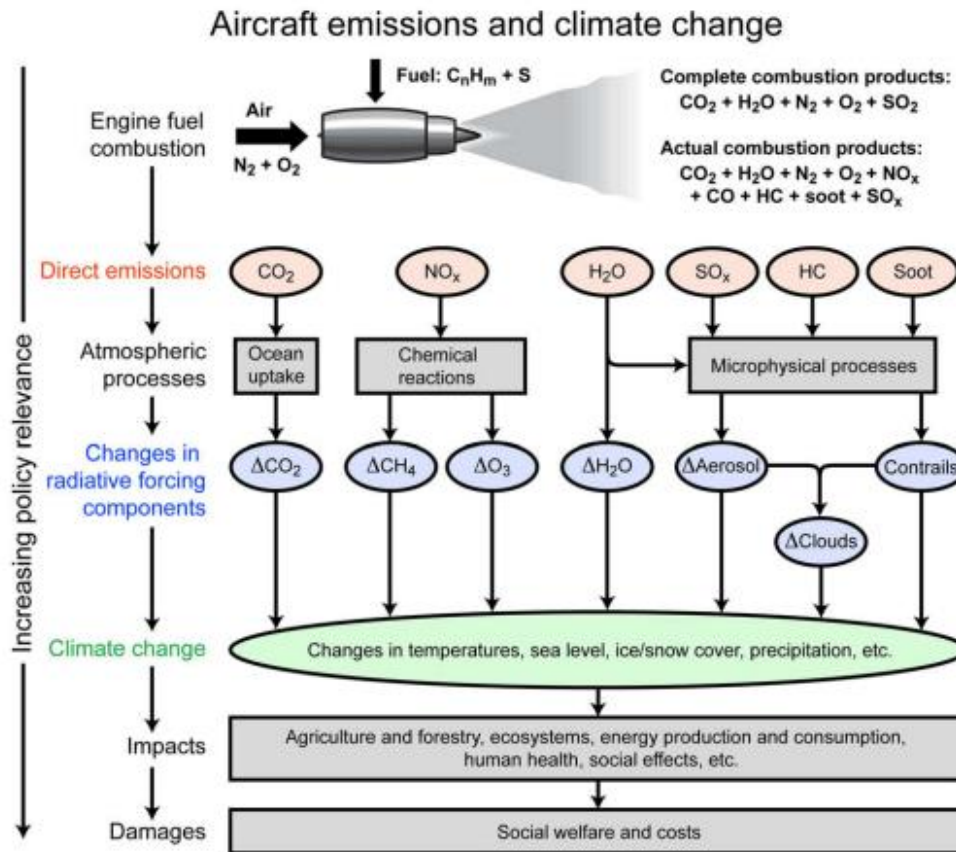
Even if aviation only contributes to 2% of global man-made CO₂ emissions, according to the International Air Transport Association [IATA], its impact on climate change is undisputed. Aircraft emit gases and particles directly into the upper troposphere, the only human enterprise to do so, and lower stratosphere. It affects atmospheric composition by, inter alia, altering the concentration of atmospheric greenhouse gases. Aviation operations significantly contribute to climate change at different levels, as it induces emissions and particles from, among others: aircraft, ground support services, auxiliary power units providing electricity and air conditioning to aircraft parked at airport terminal gates, stationary airport power sources or construction equipment operating at the airport.

Yet very harmful to the environment, CO₂ emissions are not the only emissions produced by aviation. As revealed by the Intergovernmental Panel on Climate Change (IPCC)’s report, ‘Aviation and the Global Atmosphere’:

The principal emissions of aircraft include the greenhouse gases carbon dioxide and water vapour (H₂O). Other major emissions are nitric oxide (NO) and nitrogen dioxide (NO₂) (which together are termed NO_x), sulfur oxides (SO_x), and soot. The total amount of aviation fuel burned, as well as the total emissions

¹ UN, “Tackling Climate Change”, online: UN <www.un.org/sustainabledevelopment/climate-change/>.

of carbon dioxide, NO_x, and water vapour by aircraft, are well known relative to other parameters important to this assessment.²

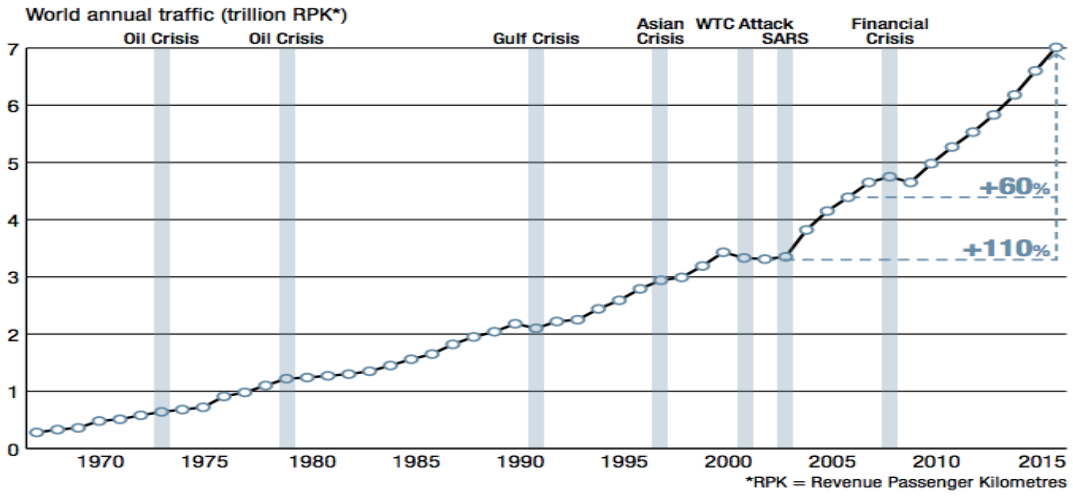


Source: D. S. Lee and al., "Aviation and global climate change in the 21st century", *Atmospheric Environment*, 43 (2009) 3520-3537, p. 3521

The concerns regarding aviation and climate change are furthermore increasing as it is estimated that traffic doubles every 15 years³, as represented by Airbus in the graphic below:

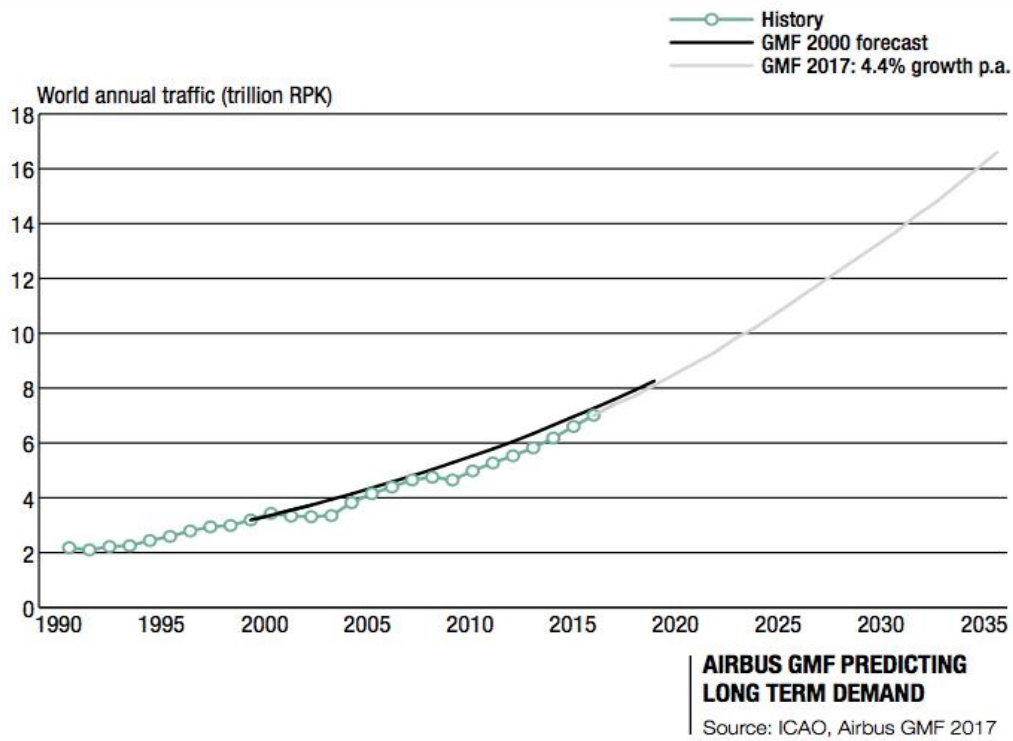
² IPCC, IPCC Special Report - Aviation And The Global Atmosphere, 1999, online : < <https://www.ipcc.ch/pdf/special-reports/spm/av-en.pdf> >, p. 3.

³ Airbus, Growing Horizons – 2017/2036, 2017, online : < http://www.airbus.com/content/dam/corporate-topics/publications/backgrounders/Airbus_Global_Market_Forecast_2017-2036_Growing_Horizons_full_book.pdf >



Source: Airbus, *Growing Horizons – 2017/2036*, 2017, p. 7.

On the basis of the existing data, forecasts estimate that traffic will double from 2017 to 2036:



Source: Airbus, *Growing Horizons – 2017/2036*, 2017, p. 23.

3. Tackling the Issue of Climate Change at ICAO Level

With the ever-increasing traffic, it is thus estimated that aviation contribution to climate change is projected to grow by a factor of approximately 3-4, thus becoming an increasing proportion of

total anthropogenic emissions (4 to 4.7%)⁴. As a consequence, the issue of aircraft emissions is on top of ICAO's agenda since the beginning of 2010, even if the contribution of aviation to global warming has already been acknowledged during the Kyoto Summit. Article 2, para. 2 of the 1997 Kyoto Protocol acknowledges the leading role of ICAO when it comes to emissions produced by aviation, by stating that:

The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

In spite of the debates surrounding this provision, most notably regarding the possibility to discuss the subject matter in other *fora*, the majority of the States accepted to address the issue of aircraft emissions at ICAO level. After years of discussions ICAO's General Assembly adopted in 2013 its Resolution A38-18 which stated that:

ICAO and its Member States with relevant organizations will work together to strive to achieve a collective medium term global aspirational goal of keeping the global net carbon emissions from international aviation from 2020 at the same level.

By setting a clear objective of establishing a scheme to reduce the impact of aviation on climate change, it helped to avoid a major opposition between the European Union and the rest of the world, after the turmoil provoked by EU Directive 2008/101, which sought to include aircraft emissions within the European Emission trading scheme (ETS), established by EU directive 2003/87. Thus, the outcome of the last General Assembly, held in 2016, is of uttermost importance and was awaited by the aviation community.

Resolution A39-3 on Consolidated statement of continuing ICAO policies and practices related to environmental protection explicitly recognized that the Assembly:

Decides to implement a GMBM scheme in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to address any annual increase in total CO₂ emissions from international civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country) above the 2020 levels, taking into account special circumstances and respective capabilities⁵.

⁴ D. S. Lee and al., "Aviation and global climate change in the 21st century", *Atmospheric Environment*, 43 (2009) 3520-3537, p. 3534.

⁵ ICAO General Assembly Resolution A39-3 on Consolidated statement of continuing ICAO policies and practices related to environmental protection, para. 5.

On 27 June 2018, the Council of ICAO adopted the First Edition of Volume IV, Annex 16 to the Chicago Convention, which was made available to Contracting States in July 2018. It became effective on 22 October 2018 and it is now applicable from the 1st January 2019.

Resolution A40-19, on Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) states that the General Assembly “Emphasizes the role of CORSIA to complement a broader package of measures to achieve the global aspirational goal, without imposing inappropriate economic burden on international aviation”.

The crucial questions to be addressed at ICAO Level

The details of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) have been set up in the Volume IV, Annex 16. The General Assembly requested ICAO’s Council to develop standards and recommended practices (SARPs) in order to implement the Monitoring, Reporting and verification system (MRV), define Emissions Unit Criteria (EUC), support the establishment of registries and work on the governance of the CORSIA.

The regime established by the new Volume IV, Annex 16 is built on the following elements:

- Are subject to CORSIA international flights (as defined in Article 1.1.2 of Volume IV, Annex 16) carried out by aeroplane operators that produce annual CO₂ emissions greater than 10 000 tonnes (Article 2.1.1 of Volume IV, Annex 16)
- During the pilot phase (2021-2023), CORSIA is applicable only to States that voluntarily participate, on a “State pair” basis⁶
- Attribution of international flights to aeroplane operators and to States for enforcement and monitoring (Part II, Chapter I, Volume IV, Annex 16)
- Choice of monitoring methods (Article 2.2.1.2 and 2.2.1.3 of Volume IV, Annex 16)
- Any aeroplane operator shall submit to the State to which it is attributed a copy of the verified Emissions Report for approval by the State and a copy of the associated Verification Report (Article 2.3.1 of Volume IV, Annex 16)
- Estimation and reporting Tool (CERT)⁷
- Offsetting requirements (Part II, Chapter III, Volume IV, Annex 16)
- The aeroplane operator shall meet its offsetting requirements by cancelling CORSIA Eligible Emissions Units in a quantity equal to its total final offsetting requirements for a given compliance period (Article 4.2.1 of Volume IV, Annex 16)

ICAO’s work is nevertheless not yet completed, as some elements still need to be adopted and approved by the ICAO Council, most notably concerning Emissions Units⁸, Eligible fuels (including fossil fuels) and the establishment of the CORSIA Central registry⁹. These elements

⁶ See, for the updated list : <https://www.icao.int/environmental-protection/CORSIA/Pages/state-pairs.aspx> [accessed on 31 December 2018].

⁷ See <https://www.icao.int/environmental-protection/CORSIA/Pages/CERT.aspx> [accessed on 31 December 2018].

⁸ See <https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Emissions-Units.aspx> [accessed on 31 December 2018].

⁹ See <https://www.icao.int/environmental-protection/CORSIA/Pages/CCR.aspx> [accessed on 31 December 2018].

will have a decisive impact on the effectivity of the CORSIA and the ability of the international aviation community to reduce its contribution to global warming.

Resolution A40-19 explicitly requested that the following actions be taken:

a) the Council, with the technical contribution of CAEP, to update the Annex 16, Volume IV and Environmental Technical Manual, Volume IV, as appropriate;

b) the Council, with the technical contribution of CAEP, to continue to develop and update the ICAO CORSIA documents referenced in Annex 16, Volume IV related to: ICAO CORSIA CO₂ Estimation and Reporting Tool; CORSIA eligible fuels; CORSIA emissions units criteria (EUC); and CORSIA Central Registry, as appropriate; c) the Council to develop and update the ICAO CORSIA document referenced in Annex 16, Volume IV related to the eligible emissions units for use by the CORSIA, considering the recommendations of the TAB;

d) the Council to establish, by early 2020, and maintain the CORSIA Central Registry under the auspices of ICAO to enable the reporting of relevant information from Member States to ICAO;

e) the Council to continue to oversee the implementation of the CORSIA, with support provided by the AGC and CAEP, as appropriate; and

f) Member States to take the necessary action to ensure that national policies and regulatory frameworks are established for the compliance and enforcement of the CORSIA, in accordance with the timeline set forth by Annex 16, Volume IV.

Hence, questions such as the calculation of historical emissions, allocation of EUC, and proper surveillance at the international level must be solved as soon as possible. On the long run, the principles of Common but differentiated responsibilities and capabilities (CBDR) and Special circumstances and respective capabilities (SCRC) must be addressed in a way to avoid undesired effects such as carbon leakage or distortions of competition. It must also be noted that several contracting States, namely Brazil, China, India and Russia formulated reservations to Resolutions A40-18 and A40-19, thus reflecting some serious opposition from important aviation Countries.

From a legal perspective, the issue of aircraft emissions must be solved having regards to both multilateral environmental (most notably the Paris Convention and the United Nations Framework Convention on Climate Change and its Kyoto Protocol) and aviation conventions, bilateral air services agreements and possible unilateral actions by States or Regional economic integration organizations (REIO).

In this respect, the Council of the European Union adopted, on 29 November 2018, a common position regarding the notification of differences to be made by its Member States¹⁰, in accordance with Article 38 of the Chicago Convention¹¹. While stating that the EU is currently working on the necessary normative adaptations to solve the differences existing between CORSIA and Directive 2003/87/EC, it raises problems of compatibility of the two instruments when it comes to their respective scopes of application:

“In respect of both, the scope of application of Directive 2003/87/EC as it currently stands shall be recalled. The Directive applies irrespective of the nationality of the aeroplane operator and in principle covers flights which depart from or arrive in an aerodrome situated in the territory of a Member State to which the Treaty applies. Directive 2003/87/EC applies without distinction to flights within and between Member States and/or EEA countries.”

As the EU does not seem willing to lower its environmental ambitions, and provided that the European Parliament is opposed to the application of CORSIA to intra-European flights¹², the issue of ensuring the compatibility of ICAO’s CORSIA and EU’s ETS mechanism is crucial in order to ensure adhesion of European States to the international instrument and avoid further unilateral actions in the future. In this respect, due attention must be paid to para. 18 of Resolution A40-19, which states that:

“CORSIA is the only global market-based measure applying to CO2 emissions from international aviation so as to avoid a possible patchwork of duplicative State or regional MBMs, thus ensuring that international aviation CO2 emissions should be accounted for only once”.

¹⁰ Council Decision (EU) 2018/2027 of 29 November 2018 on the position to be taken on behalf of the European Union within the International Civil Aviation Organization in respect of the First Edition of the International Standards and Recommended Practices on Environmental Protection — Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), *OJEU* L 325, 20 December 2018, p. 25.

¹¹ Article 38 of the Chicago Convention: “Any State which finds it impracticable to comply in all respects with any such international standard or procedure, or to bring its own regulations or practices into full accord with any international standard or procedure after amendment of the latter, or which deems it necessary to adopt regulations or practices differing in any particular respect from those established by an international standard, shall give immediate notification to the International Civil Aviation Organization of the differences between its own practice and that established by the international standard. In the case of amendments to international standards, any State which does not make the appropriate amendments to its own regulations or practices shall give notice to the Council within sixty days of the adoption of the amendment to the international standard, or indicate the action which it proposes to take. In any such case, the Council shall make immediate notification to all other states of the difference which exists between one or more features of an international standard and the corresponding national practice of that State.”

¹² See European Parliament, Resolution of 25 October 2018 on the 2018 UN Climate Change Conference in Katowice, Poland (COP24), P8_TA-PROV(2018)0430, para. 41: “Expresses concern about the level of ambition of ICAO’s Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), given the ongoing work on the Standards and Recommended Practices (SARPs) meant to implement the scheme from 2019; strongly opposes the efforts to impose CORSIA on flights within Europe, overriding EU laws and independence in decision-making; stresses that further dilution of the draft CORSIA SARPs is unacceptable; calls on the Commission and the Member States to do their utmost in strengthening CORSIA’s provisions and hence its future impact.”

4. Non-exhaustive list of potential questions to be addressed by the delegates

How to secure the compatibility of the European Union's ETS (or other regional initiatives) with the CORSIA and avoid overlapping of regulations?

How to ensure the coherence of CORSIA if several Contracting States notify differences?

Is there a way to enforce CORSIA at ICAO level or should it be at national level (including through provisions in Air Services Bilateral Agreements)?

Can the different levels of participation of Countries induce negative effects on the environment, such as 'carbon-leakage'?

How to ensure that the CORSIA will start producing effects regarding the objective of carbon neutral growth from 2021 onwards?

How can ICAO effectively monitor the implementation of the CORSIA and the related emissions?

What should be the core elements of the future CORSIA Central Registry?

5. Selected bibliography

- Convention on International Civil Aviation, 7 December 1944, 15 UNTS 295, ICAO Doc 7300/9.
- United Nations Framework Convention on Climate Change, 9 May 1992, 1771 UNTS 107.
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 11 December 1997, 2303 UNTS 162.
- Paris Agreement, 12 December 2015.
- Montreal Protocol on Substances that Deplete the Ozone Layer, 16 September 1987, 1522 UNTS 3.
- ICAO, (2008) 3 International Standards and Recommended Practices: Annex 16 to the Convention on International Civil Aviation: Volume 2, Aircraft Engine Emissions.
- IATA, An Airline Handbook on CORSIA, 3rd edition, November 2018, 54 pp., at: <https://www.iata.org/policy/environment/Documents/corsia-handbook.pdf>
- EC, Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community, [2009] OJ, L 8/3.
- Ruwantissa ABEYRATNE, “Outcome of the 39th Session of the International Civil Aviation Organization Assembly”, (2017) 42 Air and Space Law 13.
- Ruwantissa ABEYRATNE, “Environmental Politics and Law: The Search for a Global Market-Based Measures Scheme for Aircraft Emissions”, (2014) XXXIX Ann Air & Sp L 529.
- Ruwantissa ABEYRATNE, “Carbon offsetting as a trade related market based measure for aircraft emissions”, (2017) 51 Journal of World Trade (Law-Economics-Public Policy) 425.
- George T. BLUMENTHAL, Aviation and climate change, New York: Nova Science Publishers, 2010.
- Vincent CORREIA, “Las posibles soluciones para llegar a un acuerdo global sobre los derechos de emisiones”, in M. FOLCHI (ed.), Actas de las XXXIX Jornadas Latino-Americanas de Derecho Aeronáutico y Espacial, ALADA, 2016.
- Jacqueline ETIL SERRAO, “Global versus Unilateral Measures to Protect the World's Environment: Implications for the Air Transport Industry” (2002) XXVII Ann Air & Sp L 551.
- Uwe M. ERLING, “How to Reconcile the European Union Emissions Trading System (EU ETS) for Aviation with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)?”, (2018) 43 Air and Space Law, 371.
- Uwe M. ERLING, “International Aviation Emissions Under International Civil Aviation Organization’s Global Market Based Measure: Ready for Offsetting?”, (2017) 42 Air and Space Law, 1.

- Gregg FLEMING, Urs ZIEGLER, “Environmental Trends in Aviation to 2050” in ICAO, ICAO Environmental Report 2013: Aviation and Climate Change (Montreal: ICAO, 2013) 22.
- Andreas HARDEMAN, “Reframing Aviation Climate Politics and Policies” (2011) 36 Ann Air & Sp L 1.
- Andreas HARDEMAN, “A Common Approach to Aviation Emissions Trading”, (2007) 32 Air and Space Law, 3.
- Jane HUPE, “Towards Environmental Sustainability” in ICAO, ICAO Environmental Report 2013: Aviation and Climate Change (Montreal: ICAO, 2013) 11.
- D. S. LEE and al., “Aviation and global climate change in the 21st century”, Atmospheric Environment, 43 (2009) 3520-3537
- Pablo MENDES DE LEON, “Enforcement of the EU ETS: The EU’s Convulsive Efforts to Export its Environmental Values” (2012) 37 Air & Space L 287
- Alejandro PIERA VALDÉS, Greenhouse Gas Emissions from International Aviation: Legal and Policy Challenges in Marietta Benkö, ed, Essential Air and Space Law, vol 14 (The Hague: Eleven International Publishing, 2015).
- Martin STANILAND, “Regulating aircraft emissions: leadership and market power”, (2012) 19 Journal of European Public Policy 1006.
- Md TANVEER AHMAD, “Environmental Effectiveness of ICAO's Basket of Mitigation Measures to Arrest Emissions from International Civil Aviation” (2014) XXXIX Ann Air & Sp L 75.