



**GROUP ON INTERNATIONAL AVIATION AND CLIMATE CHANGE (GIACC)
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Agenda Item 2: Review of aviation emissions-related activities within ICAO and internationally

**DEVELOPMENT OF A GLOBAL SECTORAL APPROACH ON ECONOMIC MEASURES
FOR ADDRESSING AVIATION CO₂ EMISSIONS**

(Presented by the International Air Transport Association)

1. INTRODUCTION

1.1 The airline industry recognises the need to further reduce its CO₂ emissions to contribute to intergovernmental climate change objectives. This document recommends the policy approach to be adopted by governments to further the sector's efforts to meet this challenge by:

- Formulating a set of ambitious emissions reduction goals for the aviation sector contributing to global climate change objectives;
- Outlining the broader policy context and implications for the development of a sectoral approach to address aviation CO₂ emissions under a post-Kyoto agreement;
- Demonstrating that the sectoral approach can accommodate both the ICAO principle of non discrimination and the UNFCCC principle of common but differentiated responsibilities; and
- Establishing the core principles that the aviation industry should only pay once for its emissions from either international and domestic aviation, that any measures imposed should be under and consistent with the global sectoral approach and that any emissions-related measures at regional or national level should result in credits for their contribution to the reduction in the industry's global carbon dioxide emissions.

2. RECOMMENDED GOALS

2.1 The airline industry believes that any regime for aviation must be consistent with, and in proportion to its contribution to the overall level of global emissions. Industry's recommended policy approach – the broader framework of which is described in more detail below - aims to provide measurable and verifiable progress towards carbon neutral growth in the mid-term followed by absolute CO₂ emission reductions, while at the same time ensuring continued sustainable aviation growth supporting the global economy. The recommended sectoral goals are the following:

- In the short term (to 2012), despite the current economic operating climate, the aviation sector will continue to make investments in an attempt to collectively achieve improvements in fuel efficiency (litres/RTK or usg/RTM) of 1.5% on average per year until 2012.
- In the mid term (2013 - 2020), the aviation sector will collectively achieve further improvements in fuel efficiency (litres/RTK or usg/RTM) of 1.5% on average per year. It will strive to collectively achieve carbon neutral growth in the 2020 to 2025 timeframe, using additional measures as appropriate, including the use of low carbon sustainable alternative jet fuels.
- In the long term (to 2050): the aviation sector will collectively reduce its net CO₂ emissions in 2050 by 50% compared to 2005 levels.

2.2 The airline industry has a tremendous record of environmental improvement, which it has achieved through continual investments in technology, operations and infrastructure. Reaching these targets will however require a multi-faceted approach with strong commitment from all aviation stakeholders, i.e. airlines, manufacturers, airports, and air navigation service providers.

2.3 Furthermore, governments must urgently make the necessary investments to modernise air traffic management and establish the right legal and fiscal frameworks to promote investment in low carbon sustainable alternative jet fuels, as well as the potential use of cost-effective economic measures and full and unrestricted access to all available abatement measures outside the sector (offsets). The need for the airline industry to continue to have the capacity to invest in the above key emissions reduction drivers must be central to any approach. To the extent economic measures are employed, governments should ensure that carbon markets are appropriately regulated and that price ceilings are imposed so industries may make their emissions-reducing investment within reasonably stable market conditions, while being mindful that the stability of the oil market is closely interrelated with the carbon market.

3. **BROADER POLICY FRAMEWORK**

3.1 The following key principles should guide the development of the broader policy framework addressing aviation's CO₂ emissions:

3.2 **The need for a global approach**

3.2.1 The airline industry believes that CO₂ emissions from international aviation should be included in a post-Kyoto framework. Policy measures must be developed at a global level to avoid the unilateral imposition of targets and measures and to avert creating a patchwork of conflicting and potentially overlapping national and regional policies. The primary focus of a global approach should be on international aviation but any proposals should be adaptable to include domestic aviation through an opt-in system for States.

3.2.2 A key principle of a global approach is that emitters should only be charged once for the emission wherever that emission occurs (including whether from an international or domestic flight). Therefore, the approach should prevent the use of duplicative measures where different governments implement charges, taxes or other economic measures to address the same emissions from aviation. Similarly, compliance with emissions requirements in domestic markets should be recognised and credited against overall global goals under a sectoral approach.

3.3 The need for a sectoral approach

3.3.1 Emissions from aviation are best addressed through a sectoral approach. Under a sectoral approach, aviation emissions are treated as an indivisible sector total and not apportioned to individual States. Renegotiation of relevant provisions in the Kyoto Protocol is necessary to allow and facilitate the implementation of a global sectoral approach for aviation.

3.3.2 For a sectoral approach for aviation to be effective it must have an open architecture, i.e. aviation should have full and unrestricted access to carbon market instruments to meet its obligations, on a par with other sectors. The inclusion of aviation emissions in the overall post-Kyoto framework, accompanied by specific reduction targets, should make this possible.

3.4 ICAO leadership in the UNFCCC process

3.4.1 The airline industry reiterates its support to ICAO and endorses ICAO as the appropriate United Nations body for making aviation-specific recommendations in the upcoming Copenhagen climate negotiations to develop a sectoral approach to address aviation emissions.

3.4.2 The administrative body chosen to administer a sectoral approach for aviation should be one that can most efficiently and cost-effectively undertake that administration. If it is determined that a body other than ICAO could most efficiently and cost-effectively undertake the administration, ICAO must have a supervisory or other appropriate role in such an administration.

3.5 Ensuring non-discrimination between operators whilst accommodating Common but Differentiated Responsibilities between countries

3.5.1 The post-Kyoto policy framework for aviation must reconcile the UNFCCC principle of common but differentiated responsibilities (CBDR) with the need for equal treatment in air transport markets, consistent with the ICAO requirement of non-discrimination under Article 11 of the Chicago Convention. The industry believes that, with some political leadership and innovative solutions, these two principles are completely consistent in the context of international aviation¹. A global sectoral approach is the best way of achieving this.

3.5.2 ICAO has traditionally recognised and accommodated states with special needs that have difficulty complying with standards or recommended practices, either through technical and financial support or via differentiated timelines for implementation of measures. This is a tried and tested mechanism which has served ICAO well since 1946. Subject to meeting requirement for equal treatment in air transport markets, the same principle could be applied under any global emissions management framework. For example, an approach could be crafted specific to the various types of aviation markets, where the same requirements apply to all operators competing in the same market, but different requirements apply to different markets.

3.6 Cost-effective economic measures to reduce emissions

3.6.1 The airline industry can only support economic measures which are cost-effective and non-discriminatory. These measures could include emissions trading, carbon funds, offsets or other similar mechanisms as long as they are implemented globally, on the basis of consensus, provide full and open access to the global carbon market and under the auspices of ICAO.

¹ Note also that differentiated responsibilities for historical emissions is not particularly relevant for aviation as it is a relatively young industry with relatively homogeneous development.

3.6.2 Any economic measures applied to aviation under a global sectoral approach must offer the greatest environmental benefit while simultaneously providing the most cost-effective outcome for the industry. Economic measures must not create 'carbon leakage' where emissions transfer between countries or carriers leading to market distortions.

3.6.3 Any revenues from the economic measures under a global scheme to address aviation emissions should be clearly earmarked for environmental purposes. A proportion of such revenues should be re-invested in additional measures to directly improve the emissions profile of aviation, with a focus on the first three pillars of the industry's 4 pillar strategy. The balance of such revenues may be used to acquire certificated emission reductions derived from recognised climate mitigation and adaptation projects, provided that airlines are able to gain the benefit of these reductions.

3.6.4 The global sectoral approach should also incentivise operators to acquire more fuel-efficient aircraft and to purchase low carbon jet fuels, i.e. fuels that offer net carbon reductions over their full life cycle, and ensure that they receive credits for the related CO₂ benefits.

3.7 **Additional design parameters**

3.7.1 The global sectoral approach for aviation must be simple, universally applicable and straightforward to implement. Compliance by both operators and States must be enforceable at state and operator level.

3.7.2 The sectoral approach should cover only the CO₂ emissions from aircraft, consistent with ICAO's recommendation on the subject, recognising both the uncertainty in scientific knowledge and the difficulties in characterising the climate impacts of oxides of nitrogen (NO_x), contrails and high altitude emissions. Only when these effects are sufficiently well understood should consideration be given to the adaptation of measures to reflect non-CO₂ impacts.

3.7.3 Finally, Appendix A describes some key aviation-specific parameters that should also be considered when evaluating options to address aviation's contributions to climate change.

APPENDIX A

Aviation-Specific Parameters for Policy Makers

1. INTRODUCTION

1.1 Environmental responsibility is a top priority for airlines, alongside safety and security. The industry – airlines, manufacturers, and infrastructure providers – has united under a common programme to reduce its climate change impact. It has a shared vision to achieve carbon neutral growth on the way to a carbon free industry. To achieve this, it has adopted a four-pillar strategy, recognised by governments.

1.2 Aviation is responsible for 2% of global CO₂ emissions – but it is a small part of a major problem: climate change. The industry is fully committed to be part of the solution. Firstly, by investing in and driving forward technological progress; the second pillar is flying planes more effectively; and the third, building and using efficient infrastructure on the ground and in the air. The fourth pillar, positive economic instruments, for example includes incentives for research and development, globally recognised credits for emissions reductions and offsets, as well as potentially emissions trading if properly designed under the auspices of ICAO.

2. AVIATION-SPECIFIC PARAMETERS

2.1 The aviation industry, however, has many characteristics that make the development of policy mechanisms to reduce CO₂ emissions more challenging than for other fossil fuel consuming sectors. This means that some policy options applied in other sectors may not translate easily to aviation. Not only does the sector include mobile sources engaged in transboundary activities, but also many of the mechanisms for operation, new technology development and emissions reduction in general are uniquely different. This should be considered when evaluating options to address aviation's contributions to climate change.

2.2 Transboundary nature

2.2.1 Aviation presents some particular challenges to policy makers due to its international nature and the difficulty of apportioning aviation emissions to state geographic boundaries. This was recognised in the 1997 Kyoto Protocol under Article 2.2, which reaffirmed that responsibility for international aviation emissions rests with the International Civil Aviation Organization ICAO, the United Nations body charged with developing standards and recommended practices for the sector.

2.3 Technology challenges

2.3.1 Probably the most important dissimilarity between the aviation industry and other industries is the limited ability to easily develop new technologies to reduce aircraft CO₂ emissions. Unlike other sectors, aviation faces significant regulatory hurdles for new technology implementation. A good example is the complex and costly safety certification process for aircraft and engines, aimed at ensuring that aircraft and engines are safe for the general public's use in commercial air transportation. Typically, a minimum of 10 years is required to move new technology from conception to implementation.

2.3.2 In spite of these limitations, data demonstrates that the aviation industry has made very

significant efficiency gains in fuel burn and GHG emissions through the use of technological, operational and infrastructure measures. In addition, the industry also has greatly reduced other environmental exposures and impacts, including noise.

2.3.3 A recent cross-industry analysis prepared for ICAO's Group on International Aviation and Climate Change (GIACC) has highlighted that a further 29% improvement in fuel efficiency should be possible by 2020 and 50% by 2050, with improvements coming from the airlines themselves, together with measures from the airframe and aircraft engine manufacturer, air navigation service providers and airports.

2.3.4 This analysis did not factor in the potential but yet unproven opportunity of the use of lower carbon fuels such as sustainable biofuels for aviation. This technology, once available in significant quantities, will speed up the process to achieving mid and long term emission reduction goals.

2.4 **Alternative fuels**

2.4.1 In order to achieve continuing reductions in the aviation carbon footprint, it is necessary to look beyond fuel efficiency to the potential use of less carbon-intensive fuel alternatives for aviation².

2.4.2 However, the aviation industry has to date no commercially viable alternative energy source to jet kerosene. For sustainable alternative jet fuels to become a viable alternative, in addition to maintaining the safety and reliability of today's jet fuel, they must meet strict sustainability criteria along the whole supply chain on a life-cycle basis. A key attribute of this policy is that the development and deployment of alternative fuels do not compete with food production, or valuable land and/or water resources, either directly or indirectly.

2.4.3 Although the industry is actively exploring sustainable alternative fuels, particularly sustainable jet biofuels, the development of a robust alternative aviation fuel market, and research, development and commercialisation timelines mean that these fuels will not be in widespread commercial use in the next several years.

2.5 **Traffic and emissions growth**

2.5.1 Many studies project that without mitigation measures, aviation emissions will grow significantly over time. These analyses, which are typically based on unconstrained growth trajectories, represent a rather pessimistic view of future aviation emissions because they do not take into account (i) supply constraints such as limited production capacity of new aircraft, congestion in airspace and at airports and fuel supply and price considerations, (ii) demand constraints due to the state of the economy or more stringent policy measures, and/or (iii) accelerated implementation of new emissions mitigation measures.

2.6 **Interactivity of measures in driving down emissions**

2.6.1 There are three key drivers of emissions reductions within the aviation industry:

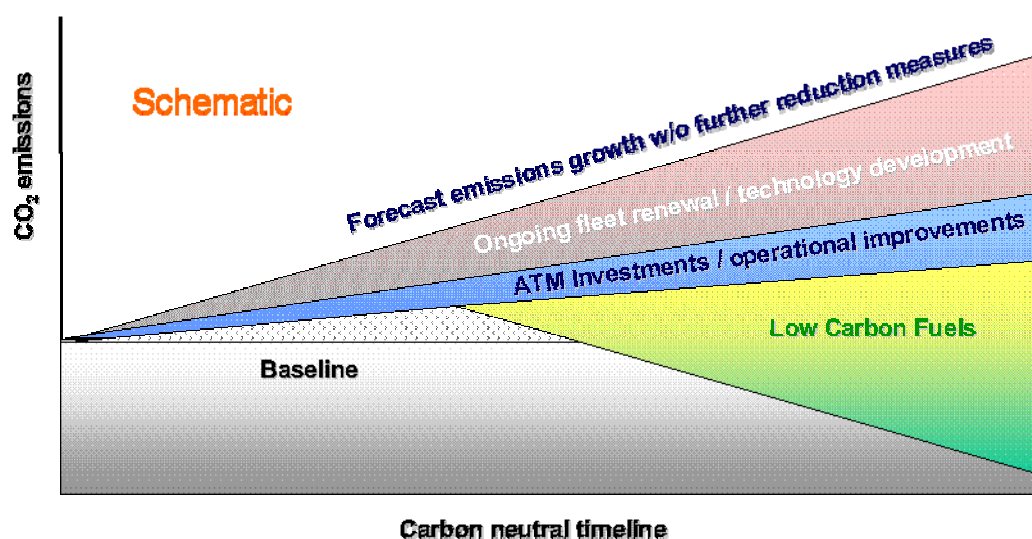
- Technology improvement
- Air traffic management improvements
- Significant introduction of sustainable alternative jet fuels

² It is expected that different parts of the world will follow varying pathways towards the introduction of less carbon-intensive fuels for aviation and that different types of alternative fuels may be introduced with different timelines.

2.6.2 It appears unlikely, however, that these drivers alone will be sufficient to stabilise, or even possibly reduce emissions, within expected political timeframes³. To address this, the entire industry (airlines, manufacturers, airports and ANSPs (including governments)) will be required to take additional positive action under some form of economic measures.

2.6.3 Figure 1 below shows, in the form of a schematic, how some form of transition or economic measures will be required in the short- to mid-term to stabilise emissions (achieving carbon neutral growth), allowing time for further technological advancements and the development of sustainable alternative jet fuels to reduce absolute emissions in the longer term.

Figure 1



2.6.4 In considering various measures, it is important to consider the interactivity of measures and the need to reflect how different measures can mutually support each other in assisting the industry to achieve its long term goal of emissions reductions. In this regard it also needs to be recognised that unduly stringent economic measures can take away from the sector's ability to invest in further emissions-reducing technology, operational and infrastructure measures. Thus, a balance among measures must be achieved. Individual measures could be introduced at specific times to meet the goals currently being evaluated.

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³ By way of illustration, the EC has asked UNFCCC to set a target that would reduce the climate impact of international aviation below 2005 levels by 2020.