



GHG emissions from international aviation bunkers: issues and concerns

Introduction

2% of the global CO₂ emissions are contributed by the aviation sector.

The transport sector contributes to the global climate change by way of GHG (greenhouse gas) emissions. According to the *IPCC (Intergovernmental Panel on Climate Change) Fourth Assessment Report*, or *AR4*, global transport is responsible for 13% of all GHG emissions (for 2004).

The *AR4* estimated that approximately 2% of the global CO₂ (carbon dioxide) emissions are contributed by the aviation sector (Figure 1). The international aviation accounted for 358.67 million tonnes of CO₂ emissions, which was around 1.44% of the total global GHG emissions for 2003 (IEA 2005). Table 1 shows the contribution of international aviation of some of the prominent nations to the CO₂ emissions for 2003.

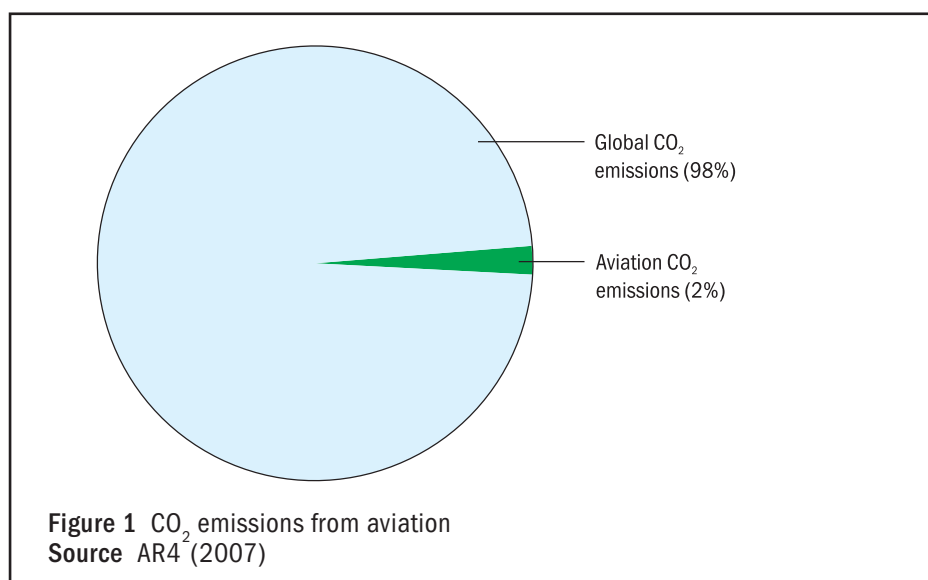


Table 1 Carbon dioxide emissions from international aviation bunkers (for 2003)

Country	<i>Emissions (in million tonnes)</i>	<i>Percentage contribution in global international aviation emissions</i>
United States	49.5	13.80
Former USSR	33.01	9.20
United Kingdom	23.47	6.54
Germany	21.34	5.95
Japan	20.56	5.73
France	15.54	4.33
China (including Hong Kong)	12.73	3.55
Mexico	7.93	2.21
India	7.83	2.18
Australia	6.87	1.92
Brazil	3.35	0.93
South Africa	2.47	0.69
Pakistan	2.39	0.67

Source IEA (2005)

Table 2 gives the averaged annual growth rates for the countries listed in Table 1, calculated by averaging the growth rate for international civil aviation CO₂ emissions between 1999 and 2003. It also gives the growth registered in the international aviation CO₂ emissions between 1990 and 2003 (IEA 2005).

Coverage of emissions from aviation

The Kyoto Protocol covers GHG emissions from the domestic aviation but not from the international aviation. Its article 2.2 mentions the following on the aspect of coverage of GHG emissions from aviation and marine bunker fuels.

Table 2 Annual growth rate and percentage growth between 1990 and 2003 for the carbon dioxide emissions from international aviation bunkers

Country	<i>Annual growth rate (%)</i>	<i>Percentage growth between 1990 and 2003</i>
Brazil	11.29	136.90
United Kingdom	7.03	80.70
China (including Hong Kong)	6.59	108.00
Former USSR	3.31	-51.50
India	3.16	47.90
Japan	2.56	54.00
Germany	1.07	50.20
Pakistan	0.16	71.20
Australia	0.06	59.70
France	-0.19	60.70
Mexico	-0.30	44.70
South Africa	-2.70	114.80
United States	-3.32	27.60
Canada	-8.12	-21.00
World	1.27	25.60

Source IEA (2005)

The Kyoto Protocol does not cover GHG emissions from international aviation bunkers.

ICAO, working within the mandate of the Kyoto Protocol, cannot compel any of the Non-Annex I countries to adopt any kind of mitigation measures against its will.

‘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.’

Thus, the Kyoto Protocol directs Annex I countries to pursue reduction of GHG emissions from aviation bunker fuels by ‘working through’ ICAO (International Civil Aviation Organization). However, the Kyoto Protocol does not clearly state whether ICAO will be acting as an advisory body or a policy forming and implementing body with regard to the measures to contain GHG emissions from civil aviation. More importantly, it is not clear whether the framework for market-based measures, which till now have been primarily addressed by the Kyoto Protocol, should be taken care of by ICAO.

Another noteworthy point in the previously mentioned statement (article 2.2) is that it exclusively mentions **Annex I countries** to pursue aviation-related GHG emission mitigations through ICAO. Thus, ICAO, working within the mandate of the Kyoto Protocol, cannot compel any of the Non-Annex I countries to adopt any kind of mitigation measures against its will.

Emissions from aviation

ICAO published ‘Draft guidance on the use of emissions trading from aviation’ in March 2007.

According to the US Department of Transport, Federal Aviation Administration, Office of Environment and Energy (2005), aircraft engine emissions roughly comprise about 70% CO₂, a little less than 30% H₂O, and less than 1% each of NO_x (oxides of nitrogen), CO (carbon monoxide), SO_x (oxides of sulphur), VOC (volatile organic compound), particulates, and other trace components.

ICAO’s ‘Draft guidance on the use of emissions trading from aviation’ mentions that the ‘primary direct greenhouse gas emissions of aircraft are carbon dioxide and water vapour’ (paragraph 2.3.2) (ICAO 2007). It further identifies CO₂ emissions from aviation forming the largest chunk in GHG emissions from the aviation sector. Besides, other non-CO₂ effects are also potentially significant. But since a high degree of scientific uncertainty is still associated with these non-CO₂ impacts, the guidance recommends lone inclusion of CO₂ in an ETS (Emissions Trading Scheme) covering aviation.

History of negotiations within ICAO

In its efforts to mitigate the impacts of GHG emissions from international civil aviation, ICAO, working within the mandate of the Kyoto Protocol, has undertaken various technological and operational measures and has been putting onus on formulating market-based measures. It has adopted resolution A35-5 in this regard in its 35th assembly session, which was held in October 2004. With the view of developing an ETS for international aviation, the assembly requested the ICAO Council to prepare guidance material to incorporate emissions from international aviation into contracting states’ ETS. In response, ICAO’s CAEP (Committee on Aviation Environmental Protection) came up with the ‘Draft guidance on the use of emissions trading for aviation’, with a view to address the structural and legal basis for aviation’s participation in an open emissions trading system, including key elements such as reporting, monitoring, and

Actions taken to tackle emissions included three approaches, namely, technology interventions to reduce emissions and setting standards, undertaking operational measures, and adopting market-based measures.

Some of the nations raised concern over the EU's (European Union's) unilateral approach in including international aviation in the EU ETS.

compliance. The guidance material was deliberated upon in the 7th Meeting of the CAEP, held in February 2007. It got published after getting the approval from the Council of ICAO in its 180th session, which was held in March 2007.

During the 36th session of the assembly, a detailed discussion on the various aspects of addressing the emissions from international aviation was held. In its paper A-36 WP/39, the Council recalled that actions taken to tackle emissions included three approaches, namely, technology interventions to reduce emissions and setting standards, undertaking operational measures, and adopting market-based measures, and with respect to the latter, ICAO, working through the CAEP, has primarily covered voluntary measures, emission-related charges, and emissions trading.

While addressing the usage of emission-related charges, various difficulties, including those of policy and legal nature, were encountered during the CAEP 7 cycle. This led to the formation of a CSG-LAEC (Council Special Group on Legal Aspects of Emissions Charges). Noting the difficulties entailed in the development of GHG emission charges and greater potential in the development of LAQ (local air quality) emissions charges, the CAEP Steering Group, based on the work of the special group, decided to terminate the development of GHG emission charges and concentrate on LAQ emissions charges and emissions trading.

A detailed discussion on the guidance provided by the guidance material of ICAO was held. Many nations, including Chile, China, Egypt, a group of African states led by Nigeria, and LACAC (Latin America Civil Aviation Commission), strongly registered their demand of considering the UNFCCC (United Nations Framework Conventions on Climate Change)-endorsed 'Common But Differentiated Responsibility', or CBDR, principles while proposing any market-based measure, including ETS, targeted at minimizing the emission impacts of international aviation.

Some of the nations, including Chile (in its paper WP/285, submitted in the 36th session of the ICAO assembly), a group of African states led by Nigeria (WP/251), and LACAC member states (WP/130), also raised concern over the EU's (European Union's) unilateral approach in including international aviation in the EU ETS, specifically mentioning the EU's negligence to address CBDR principles.

On the other hand, Portugal, on behalf of the Member States of the EU, together with the other States Members of the ECAC (European Civil Aviation Conference) and EUROCONTROL, mentioned the ineffectiveness of ICAO's work on GHG charges in contributing to the reduction of emissions (A-36/WP-70), which was a strategic objective of the organization and the aim of article 2.2 of the Kyoto Protocol, promoting the freedom of contracting states in taking 'the measures or combination of measures they deem necessary to fulfil their international obligations to combat climate change.' Moreover, regarding the EU's approach to bring emissions from international aviation into EU ETS, the paper, while quoting the Chicago Convention, states the following:

'It is fundamental that the measure be applied to all airlines operating within the scope of the scheme without distinction as to nationality'.

The document further invites the assembly to ‘re-affirm its commitment to the principle of non-discrimination on the basis of nationality in the application of environmental measures.’

The problem

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It is evident from the above discussion that there are differences on the issue of adoption of market-based measures in order to address GHG emissions from international civil aviation and, in particular, on the issue of ‘geographic scope’ of such measures.

Some of the countries want the adoption and application of market-based measures, in order to address GHG emissions from aviation, to be carried out equally and ‘without discrimination’ throughout the globe, based on the principles of the Chicago Convention, which establishes ‘the principle of non-discrimination on the basis of nationality’. On the other hand, other nations want the adoption of CBDR principles in any proceeding on the matter. The debate has entered into a deadlock, and there is a strong need to act promptly to develop clear and precise controls and guidelines regarding an ETS or any other measure so as to avoid unilateral actions by countries (which incidentally is already being done by Europe) and also to ensure that the progress of air transport is not hindered, and the participation of airlines from developing countries in the air transport industry is not restricted.

Possible solution¹

One of the solutions could be to adopt a ‘global but differential approach’ towards the application of measures.

One of the solutions could be to adopt a ‘global but differential approach’ towards the application of measures. To elaborate further, differentiation in an economic instrument may be applied at the point of collection or at the point of distribution. Application at the point of collection may be difficult and cause market distortion but may be effectively applied at the point of distribution. Thus, any economic instrument, whether it is tax, levy or a charge, may be equally applied on all aircraft, and the revenues collected may be transferred to a common fund. The distribution of the fund to different nations should be done differentially, providing major share to developing countries, such that the benefits to the developing countries outweigh the costs. The fund can be utilized for various measures, including mitigation, adaptation, technology assistance, and capability building related to climate change, in developing countries.

Recommendations

- The responsibility of addressing the problem imposed by GHG emissions from international civil aviation does not directly fall within the mandate of ICAO, but it addresses this problem through the UNFCCC (through the Kyoto Protocol, article 2.2). Therefore, the framework and policies adopted by the UNFCCC in this regard (such as CBDR principles) will definitely override any of the regulations (including the Chicago Convention) existing within ICAO.

¹ As of now, GHG emissions from international aviation bunkers do not fall under the Kyoto Protocol regime, and there are issues relating to the identification of aircraft, ownership of the aircraft, accountable entity, and so on, rendering the sector unconventional, and therefore, an attempt has been made to study this sector on an exclusive basis, with no intent to lay emphasis on the adoption of the sectoral approach.

The viewpoint and interests of developing nations should get an exclusive standing in all the discussions and negotiations on the issue.

- The role of ICAO in handling the issues related to GHG emissions from aviation should be defined elaborately and clearly by the UNFCCC. The current reference in the Kyoto Protocol (article 2.2) is vague and liable to misinterpretation.
- Since the UNFCCC is the principal body in handling the issues related to global GHG emissions, it should retain this position in the context of GHG emissions from international aviation. ICAO may serve as an advisory body on the issue and may play a supportive role. However, if the formulation of an alternative framework to address GHG emissions is done by some other organization, it may undermine the Kyoto Protocol.
- Unilateral approach by any state or a group of states on the issue of inclusion of international aviation into an ETS must be strongly discouraged, and steps should be taken to form a consensus among member states.
- The viewpoint and interests of developing nations should get an exclusive standing in all the discussions and negotiations on the issue.

Conclusion

Climate change, whether induced by the civil aviation sector or by other sectors, is a global issue, and thus, mitigation measures would require participation from all the nations. However, the amount and type of contribution should differ as per the divergent circumstances of different states, particularly developing countries. This forms the crux of CBDR principles adopted by the UNFCCC and has been very well integrated within the framework of the Kyoto Protocol. A similar kind of effort is needed to address GHG emission from international aviation. Before adopting any measure, whether it is technological, operational or market-based, the approach towards implementation of these measures must be finalized in line with the overarching goals of the UNFCCC.

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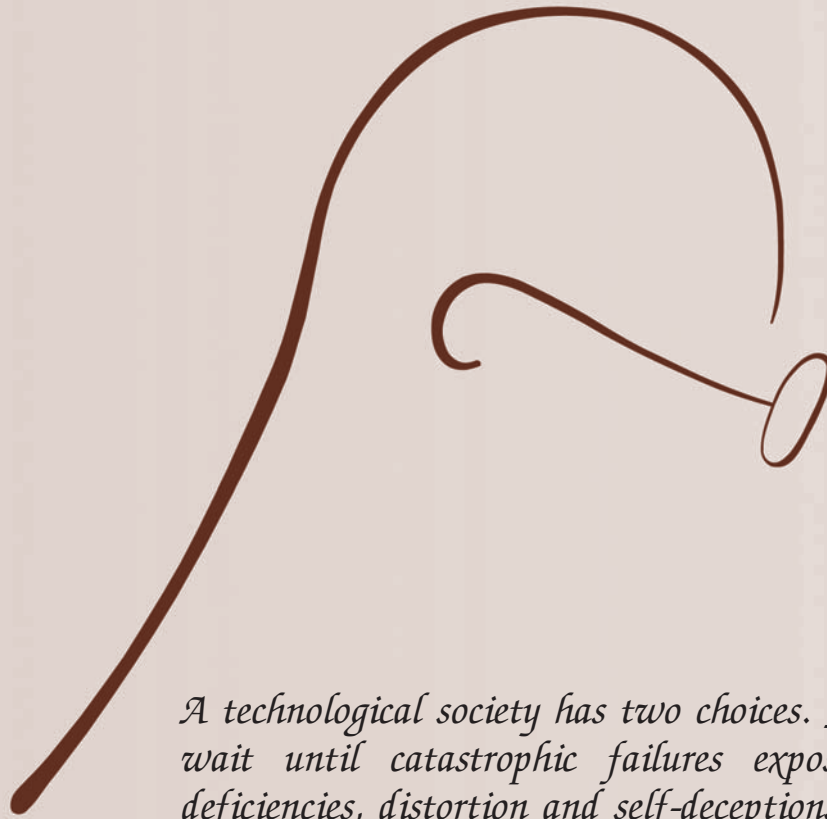
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A technological society has two choices. First it can wait until catastrophic failures expose systemic deficiencies, distortion and self-deceptions...

Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures.

Mahatma Gandhi

For further details, contact

Suruchi Bhadwal
Area Convener
Centre for Global Environment Research
TERI
Darbari Seth Block
IHC Complex, Lodhi Road
New Delhi - 110 003

Tel. 2468 2100 or 4150 4900
Fax 2468 2144 or 2468 2145
India +91 • Delhi (0) 11
E-mail suruchib@teri.res.in
Web www.teriin.org