



**WORKING PAPER**

**HIGH-LEVEL MEETING ON INTERNATIONAL AVIATION  
AND CLIMATE CHANGE**

**Montréal, 7 to 9 October 2009**

**Agenda Item 1: Aspirational goals and implementation options**

**ASPIRATIONAL GOALS AND IMPLEMENTATION OPTIONS**

(Presented by the Secretariat)

**SUMMARY**

This paper presents aspirational goals developed by the GIACC to reduce aviation's impact on climate change, and related proposals emanating from the UNFCCC process and industry, for the consideration of the HLM-ENV.

Action by the HLM-ENV is in paragraph 7.

**1. INTRODUCTION**

1.1 The Assembly Resolution A36-22, Appendix K "ICAO Programme of Action on International Aviation and Climate Change" requested the Council to develop an aggressive Programme of Action that encompasses the identification of possible global aspirational goals in the form of fuel efficiency for international aviation and possible options for their implementation.

**2. ASPIRATIONAL GOALS FROM GIACC**

2.1 The GIACC held its first meeting in February 2008. At its second meeting in July 2008, a working group was formed to expedite work on aspirational goals. The working group presented a paper to the third meeting (GIACC/3-WP/2)<sup>1</sup> in February 2009, examining the feasibility of possible aspirational goals which emerged from previous discussions and providing a set of options for global aspirational goals in the form of fuel efficiency. The GIACC/3 subsequently developed support for a short-term goal until the year 2012 of improving fuel efficiency at an indicative level of 2% per year. Agreement was not reached on either a mid-term or long-term goals, and the GIACC/3 agreed to form another working group in this area to further explore options for consideration at the fourth and final meeting (GIACC/4) in May 2009.

<sup>1</sup> All documents related to GIACC are available at : [http://www.icao.int/env/meetings/Giacc\\_Root.html](http://www.icao.int/env/meetings/Giacc_Root.html)

2.2 At the GIACC/4 meeting, the working group presented a paper (GIACC/4-WP/2) recommending global aspirational goals in the form of fuel efficiency for the short, medium and long-term, however, the working group was not able to achieve consensus on developing goals which demonstrate stronger ambition e.g. carbon neutral growth or carbon emissions reductions.

2.3 The working group recommended, and the GIACC subsequently adopted, the following global aspirational goals:

- an annual fuel efficiency improvement until 2012 of 2% for the short-term;
- an annual fuel efficiency improvement of 2% from 2013 to 2020 for the medium-term; and
- an annual fuel efficiency improvement of 2% from 2021 to 2050 for the long-term.

2.4 The fuel efficiency goals agreed by the GIACC would not attribute specific obligations to individual States. The different circumstances, respective capabilities and contribution of developing and developed States to the concentration of aviation GHG emissions in the atmosphere will determine how each State may contribute to achieving global aspirational goals.

2.5 In addition to fuel efficiency goals, the GIACC considered goals that could indicate stronger ambition. For the medium-term, the discussions focused on a goal of carbon neutral growth by 2020. For the long-term, the GIACC discussed carbon emissions reductions. No consensus was reached in either case, and GIACC recommends further work on both medium and long-term goals.

### 3. **FUEL EFFICIENCY METRIC**

3.1 The annual fuel efficiency goals agreed by the GIACC (see paragraph 2.3 above) are expressed in terms of “volume of fuel used per Revenue Tonne Kilometre (RTK) performed.” This metric is similar to the one employed by the CAEP for its work on quantifying future CO<sub>2</sub> emissions trends and fuel efficiency improvements of the global aviation system. The difference is that the CAEP metric is expressed in mass units instead of volume of fuel. It should be noted that the CAEP has agreed on the further refinement of its fuel efficiency metric in order to take into account the use of alternative fuels for aviation, in line with recommendations from GIACC.

### 4. **CUMULATIVE EFFECT OF EFFICIENCY GOALS**

4.1 The GIACC recommended a global aspirational goal of 2% annual improvement in fuel efficiency of the international civil aviation in-service fleet. This would represent a cumulative improvement from a 2005 base level of:

- 13% ( $100 \times (1 - 0.98^7)\%$ ) until 2012 for the short-term;
- 26% ( $100 \times (1 - 0.98^{15})\%$ ) until 2020 for the medium-term; and
- 60% ( $100 \times (1 - 0.98^{45})\%$ ) until 2050 for the long-term.

4.2 Following the request from GIACC/3, CAEP provided GIACC/4 with the preliminary result of its technical work on the quantification of future CO<sub>2</sub> emissions trends and fuel efficiency improvements of the global aviation system for the period 2006 through 2050 (GIACC/4-IP/1), which concluded that global aviation fuel burn is expected to grow from 190 Mt in 2006 to a level in 2050 in the range of 280 to 1,430 Mt (likely in the range of 730 to 880 Mt). Not accounting for the impact of alternative fuels, CO<sub>2</sub> is predicted to grow from 600 Mt in 2006 to a level in 2050 in the range of 890 to 4,520 Mt (likely in the range 2,300 to 2,800 Mt).

4.3 CAEP's work also concluded that on a per-flight basis, fuel efficiency is expected to continue to improve through 2050. However, even under the most aggressive technology forecast scenarios, this anticipated gain in efficiency from technological and operational measures does not offset the expected growth in demand driven emissions, but leads to an emissions "gap" relative to the 2006 (or earlier) levels. In order to achieve sustainability of the sector in the future, closing this gap will require additional interventions. A multi-faceted approach towards this objective may be possible through a combination of measures including deployment of alternative fuels, unforeseen technological advances, operational measures, and market based measures. More information on aviation's impact on climate change is provided in HLM-ENV/09-IP/4.

## 5. PROPOSED GOALS BY INDUSTRY

5.1 IATA submitted a paper to the GIACC/4 (GIACC/4-IP/6), in which the airline industry presented the view that any regime for international aviation must be consistent with, and in proportion to its contribution to the overall level of global emissions. Industry's recommended policy approach aims to provide measurable and verifiable progress towards carbon neutral growth in the mid-term followed by absolute CO<sub>2</sub> emission reductions, while at the same time ensuring continued sustainable aviation growth supporting the global economy. The recommended sectoral goals are:

- 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<sup>2</sup>) of 1.5% on average per year until 2012;
- In the mid-term (2013 to 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; and
- In the long-term (to 2050): the aviation sector will collectively reduce its net CO<sub>2</sub> emissions in 2050 by 50% compared to 2005 levels.

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<sup>2</sup> usg: US gallons; RTM: Revenue Tonne Mile

## 6. UNFCCC TARGETS

6.1 In December 2007, governments working under the auspices of the UNFCCC launched a new negotiating process (the Bali Roadmap<sup>3</sup>) that aims to develop a comprehensive agreement on how to address climate change in the period beyond 2012. It is anticipated that such an agreement will be finalized by COP15 in December 2009.

6.2 During the UNFCCC negotiations, various proposals have been put forward on global emission reduction targets taking into consideration the recommendations by the IPCC 4th Assessment Report. The proposed reductions of global CO<sub>2</sub> emissions under consideration range between 50 and 85% below 1990 level by 2050. Such reductions are consistent with the IPCC scenarios relating to the stabilization of the atmospheric concentrations of CO<sub>2</sub>-equivalent emissions at 445 to 490 ppm level, and to keeping the global average temperature increase at 2.0 to 2.4°C above the pre-industrial level.

6.3 The draft negotiating text that is currently under consideration within the UNFCCC process also includes proposals relating to the treatment of emissions from international aviation (and maritime transport).<sup>4</sup> Although, at present, there are no proposals for specific reduction percentages, Parties have been discussing how possible targets for international aviation (as part of a future climate change agreement) would constitute a comparative contribution from international aviation toward the future global emissions reduction goal mentioned in paragraph 6.2 above.

## 7. ACTION BY THE HIGH-LEVEL MEETING

7.1 The HLM-ENV is invited to:

- a) acknowledge the impact of international aviation on global climate and the need for the sector to contribute to the global efforts to address climate change, taking into account its share of responsibility;
- b) acknowledge that, in the current negotiating process under the UNFCCC, there are proposals considering how to address emissions from international aviation in the context of a new climate change agreement;
- c) acknowledge that the aviation industry has been taking very proactive steps in proposing emission reduction targets for the sector, i.e. the IATA's goals of carbon neutral growth by 2020 and 50% emissions reduction by 2050;
- d) note that GIACC has recommended aspirational goals of annual improvement in the form of fuel efficiency for international civil aviation, of 2% for the short, medium and long-terms up to 2012, 2020 and 2050 respectively;
- e) acknowledge that these goals recommended by the GIACC and adopted by the Council will not reduce aviation's absolute emissions of CO<sub>2</sub>;

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<sup>3</sup> This encompasses the Bali Action Plan (developed to address climate change under the Convention) and the continuation of the negotiating process on further commitments for Annex I Parties under the Kyoto Protocol.

<sup>4</sup> See Appendix of HLM-ENV/09-WP/6.

- f) agree on the need for more ambitious goals for international aviation emissions reductions to be established under the auspices of the ICAO; and
- g) request ICAO to establish a process in order to elaborate the implementation aspects of these goals agreed upon by the HLM-ENV, for the consideration of the 37th Session of the ICAO Assembly in 2010.

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