



GROUP ON INTERNATIONAL AVIATION AND CLIMATE CHANGE (GIACC)

THIRD MEETING

Montréal, 17 to 19 February 2009

Agenda Item 3: Planning of actions and policy elements to be developed by the Group

REPORT OF WORKING GROUP 1

(Presented by the Chair of Working Group 1)

1. BACKGROUND

1.1 At the second GIACC meeting three Working Groups were established to examine the key elements of the proposed ICAO Programme of Action. Working Group 1 was established to develop options for short, medium and long-term aspirational goals, for consideration at GIACC/3.

1.2 Ms Brigita Gravitis-Beck (Canada) was the Chair of Working Group 1. Other members on the Working Group were representatives from China, France, Japan, and Mexico. The United States participated as an Observer.

2. MEETINGS

2.1 Working Group 1 held one face-to-face meeting in Paris on 30 and 31 October 2008 and seven teleconferences on 3 September 2008, 15 October 2008, 2 December 2008, 9 December 2008, 6 January 2009, 13 January 2009 and 20 January 2009.

3. DELIVERABLES

3.1 The Terms of Reference for Working Group 1 required the group “to provide a set of options with respect to particular global aspirational goals in the form of fuel efficiency, their time scales, challenges and metrics...” The group was also to consider medium-term goals in the form of fuel efficiency and the potential for carbon neutral growth; and long-term goals as well as absolute emissions reductions.

3.2 The Report of Working Group 1 on the results of its work is at Attachment A. The paper reflects the discussion of options related to short, medium and long term goals, time scales, responsibility and accountability for aspirational goals, the special needs of developing countries and metrics for fuel efficiency.

3.3 This report attempts to capture the range of views expressed by Members of the Working Group, their Advisors and the U.S. Observer. Where there appeared to be some convergence of ideas, this is noted. In other cases, the specific views of individual Members are identified, and we invite the Members to speak to these perspectives at GIACC/3, so that they may be fully understood by GIACC Members.

3.4 There was agreement that aspirational goals would be non-binding and apply collectively to all Member States i.e., without specific individual obligations in the short term. Consensus was achieved on a fuel efficiency metric of fuel consumed per revenue-tonne-kilometre performed. Aligning ICAO timelines with those of the UNFCCC was also generally well received, although not unanimous. There was general recognition that ICAO should assert its position as the global expert on international civil aviation, including with respect to international aviation emissions.

4. ISSUES

4.1 **Short Term Fuel Efficiency Goal:** Working group 1 agreed on the concept of establishing a goal for fuel efficiency over the short-term that is based on historic fuel efficiency rates. To illustrate for GIACC Members what this goal could mean, the Annex to the WG-1 Report expresses the short term goals in terms of numeric targets.

4.2 **Fuel Efficiency versus carbon neutral growth and absolute reductions:** Members debated inclusion of carbon neutral growth and absolute emission reductions in medium and long term goals for international aviation emissions. While there was some agreement on a short-term aspirational goal, there was no consensus on medium or long-term goals. Nonetheless, the report relates the options discussed by Working Group 1 Members for medium and long-term goals.

4.3 **Developed and developing countries:** The principle of Common but Differentiated Responsibilities received considerable discussion and there was broad recognition that different Member States are at different stages of development and have different needs. Although several options were proposed to address the needs of developing countries, there was no consensus on possible actions. The report reflects the range of views expressed.

5. ACTION BY THE GIACC

5.1 The GIACC is invited to:

- a) consider the Report from Working Group 1 in developing the Programme of Action;
- b) note the issues discussed in paragraph 4 which may require further consideration by GIACC as a whole; and
- c) focus its discussion on the recommendations of WG-1 as summarised in Appendix B.

Working Group One (WG/1) – Aspirational Goals Report to GIACC/3

Working Group 1 was established to develop options for short, medium and long-term aspirational goals, for consideration at GIACC/3.

Members of the Working Group are:

Ms. Brigita Gravitis-Beck (Chair)	CANADA
Mr. Gilberto Lopez Meyer	MEXICO
Mr. Paul Schwach	FRANCE
Mr. Keiji Takiguchi	JAPAN
Mr. Zhanbin Wang	CHINA

The Working Group was joined by **Mr. Carl Burleson of the United States**, as an Observer. All comments reflect the participation of Members, their Advisors and the Observer in an expert capacity. Views do not necessarily reflect a Member State's policy position.

WG/1 outcomes should not be viewed as directive but are intended to facilitate GIACC discussion

This report attempts to capture the range of views expressed by Members of the Working Group, their Advisors and the U.S. Observer. Where there appeared to be some convergence of ideas, this is noted. In other cases, the specific views of individual Members are identified, and we invite the Member to speak to this perspective at GIACC/3, so that it may be fully understood by GIACC Members. China noted that this document does not address the provisions of paragraph 2 of Article 2 of the Kyoto Protocol.

Working Group 1 notes that the Terms of Reference for GIACC directed Members to recommend a programme of action and common strategy. On the question of aspirational goals, the Terms of Reference direct GIACC to:

1. *Determine possible aspirational goals consistent with Appendix K of Resolution A36-22*
 - a) *consider short, medium and long-term goals which guide the programme of action;*
 - b) *discuss what possible goals and implementation of such goals could encompass and what roles various stakeholders would have in implementing such goals.*

We note that, at GIACC/2, there was no consensus to consider aspirational goals beyond fuel efficiency. Appendix K of Resolution 36-22 adopted at ICAO's 36th Assembly made reference to fuel efficiency only. At GIACC/2, some Members preferred to also consider

goals in the form of carbon-neutral growth and absolute reductions in CO₂ emissions. The Terms of Reference for WG/1 directed us to produce a report to GIACC/3 “*providing a set of options with respect to particular global aspirational goals in the form of fuel efficiency*” for the short, medium and long terms. We also discussed and considered, pursuant to the Terms of Reference, “*the potential for carbon-neutral growth, and “absolute emissions reduction” for the medium and long terms, “and the methods to achieve them”*”.

Our Terms of Reference directed WG/1 to identify timescales and a fuel efficiency metric. We were asked to “*develop options that quantify the potential aspirational goals identified by GIACC/2, considering the degree of challenge involved in setting such aspirational goals at different levels, and over short, medium and long terms*”. WG/1 was also asked to “*advise on how to take into consideration the special needs of developing countries and advise on the scope of application of this option and implementation for ICAO and its Member States*”.

China noted that the Terms of Reference were not a debated and agreed text.

WG/1 Members collaborated through teleconferences, email exchanges and a face-to-face meeting in Paris on October 30 and 31, 2008.

Aspirational Goals Defined

1. **WG/1 concluded that use of the term “aspirational goals” in our Terms of Reference, should be interpreted as non-binding objectives** that would be agreed to collectively by Member States, without specific individual obligations.
2. **WG/1 Members agreed with setting non-binding short, medium and long-term aspirational goals for fuel efficiency.** That is, Member States of ICAO would commit to achieving the aspirational goals collectively, while “*acknowledging the principles of non-discrimination and equal and fair opportunities to develop international civil aviation set forth in the Chicago Convention, as well as the principles and provisions on common but differentiated responsibilities and respective capabilities under the UNFCCC and the Kyoto Protocol.*” (Appendix K, Preamble) This will require Member States to work with all aviation stakeholders to achieve results.

Short, Medium and Long Term Defined

3. There was general consensus that the UNFCCC Secretariat and ICAO, as two United Nations agencies with responsibilities for action on climate change, should follow similar timescales. **WG/1 recommends that GIACC consider timescales of 2012, 2020 and 2050 or other timelines as may be established in the United Nations Framework Convention on Climate Change (UNFCCC) process.**

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4. The United States held a dissenting view on short and medium-term timelines; it proposed an option of 2014-15 for short term and 2024-25 for the medium-term timescales. The United States pointed out that 2012 does not allow much time to demonstrate short-term improvement and recommended 2025 as a time-frame for the medium term, as it aligns with the US NextGen traffic plan and with timelines for inserting new technologies into aircraft fleets.
 5. **The general view of WG/1 Members was that a medium-term timeframe of 2025 would be acceptable to Member States as long as it was consistent with UNFCCC timelines and related arrangements.**
 6. Finally, the group noted that CAEP’s current forecasting timelines do not coincide with UNFCCC reporting and forecasting timelines. **WG/1 recommends that CAEP adjust its timelines for reporting and forecasting on international aviation and climate change to coincide with UNFCCC timelines, wherever possible.**

Responsibility and Accountability

7. WG/1 Members agreed that ICAO should assume responsibility for setting reporting requirements and tracking emissions. Making this information available is also considered a key role for ICAO. **WG/1 recommends that ICAO establish rigorous annual reporting, by Member States, on fuel consumption and fuel efficiency. ICAO should publish the results**, in order to provide transparency on performance of the aviation sector. It was noted that IATA could be approached to provide essential data. The application of reporting requirements to developed and developing Member States is discussed under *Section 4: Special Needs of Developing Countries*.
8. **WG/1 recommends that ICAO adopt a resolution and provide guidance to Member States on the priority measures that are developed by Working Group 2 for addressing emissions.** Development of compulsory measures i.e. Recommended Practices was not considered appropriate.
9. Japan noted that, if ICAO adopts only collective goals, ICAO should provide additional mechanisms to encourage states to reduce CO₂ emissions or to improve efficiency.
10. Canada noted that since ICAO is not generally an enforcement agency, GIACC should consider how to link its work to the UNFCCC process. In this regard, a mechanism for enforcement would have to be considered if the goals for international aviation were to become binding in future.

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11. France noted that in a situation of future binding goals, by definition, international aviation involves two States, and therefore, commitments could be made by pairs of States and could be governed by bilateral air services agreements. This concept was further developed in the discussion of the Special Needs of Developing Countries (see next section).

Special Needs of Developing Countries

12. WG/1 Members recognized that different countries have different capacities and needs, and that it will be important to reflect these differences in the Programme of Action that will be developed by GIACC.
13. China proposed that the distinction between Annex I and non-Annex I countries in the UNFCCC be applied in the ICAO Programme of Action on Climate Change, in accordance with the principle of Common But Differentiated Responsibilities. However, for international aviation, the developed country Members did not endorse this distinction between Annex I and non-Annex I countries.
14. It was noted that some developing countries have strong airlines that compete directly, on the same routes, with the airlines of developed countries. Some national airlines of developing states have very modern fleets and a high level of fuel efficiency.
15. China noted that the possession of a modern fleet of aircraft is not sufficient as an efficiency indicator; such factors as operational management, air traffic management, and airport services, etc. must also be taken into consideration. The main constraint on fuel efficiency improvements in developing countries is the lack of assistance from developed countries in terms of technology, finance and capacity building.
16. Working Paper GIACC/2-WP4 identifies no difference in fuel efficiency between developed and developing countries. As a result, most WG/1 Members are of the view that **fuel efficiency goals should apply equally to all countries.**
17. It was noted that there is a small number of ICAO Member States whose airlines would be responsible for 95% or more of total emissions from international aviation. These would be the top twenty or thirty aviation countries.
18. Since the goals would be aspirational only, accountability would be achieved through reporting requirements, and publication of these results. Views were expressed that the top 20 or 30 international aviation countries (measured by share of total revenue tonne kilometers) should be required to report annually to ICAO. Some Member States in this top 20 list are developing countries. Under this proposal, countries with less developed international aviation sectors would commit to improve fuel efficiency, but would not be required to report. **Proponents suggest that a**

minimum threshold be identified, to distinguish between those countries with strong international aviation sectors (who would be required to report to ICAO on progress) and those with smaller impact.

19. **China did not agree with the approach in paragraph 18 because it contradicted the UNFCCC distinction between Annex 1 and non Annex 1 countries. China noted that its share of international aviation is due to its large population and would be low if measured on a per capita basis.**
20. France noted that in a possible future situation of binding commitments, the special needs of developing countries could be accommodated by enforcement of CO₂ reduction commitments through bilateral air services agreements. The commitments of States could vary from one country pair to another. Two developed countries could agree to reduce total emissions on their routes. The need for growth in aviation to and from a developing country could be recognized by allowing some growth in emissions on routes between developing and developed countries; however, airlines from both countries should benefit equally. Flights between developing countries could be left out of the regime, at least for a period of time.
21. China seeks support to develop its Air Traffic Management system, to adopt new technologies and to build expertise. Other developing countries may have different needs. **It will be important to ensure that GIACC's Programme of Action covers the spectrum of needs of developing countries.**
22. Canada noted that assistance to developing countries could include knowledge transfer and support for data collection and reporting.
23. **All WG/1 Members agreed that financial support for infrastructure development, capacity building and technology transfer are important measures to address the special needs of developing countries.** Some WG/1 members were of the view that, although ICAO can use its offices to encourage developed Member States to provide this assistance, the preferred mechanism is through development assistance organizations, including international development banks. It was recognized that some support to developing States in the form of financial and technical support is already provided.
24. China recommends that the developed countries set up a special body to help developing countries with financial and technical support to develop their aviation sectors. The US Trade Development Assistance organization and FAA efforts to assist in the modernization of aviation infrastructure were cited as examples.
25. The UNFCCC Clean Development Mechanism provides a reliable accountability framework for development projects. France noted that recognition of investments through the Clean Development Mechanism would operate as an incentive for developed countries to invest in such projects, as they would be counted as offset

investments for those countries that are subject to an emission-trading scheme. Japan, while noting the importance of the expansion of the CDM into the field of international aviation, expressed concern that under current rules the CDM could only be expanded under the prerequisite condition that international aviation is included in the general framework of the UNFCCC in the post Kyoto period. Japan also questioned whether a specific CDM, applied only to international aviation, could be established in the post Kyoto period. **WG/1 suggests that ICAO and ICAO Member States seek expansion of the UNFCCC Clean Development Mechanism to include investments in international aviation projects in developing countries.** It was noted that any effort in this area would need to be closely coordinated and more discussion is needed to clarify how this might be implemented.

Fuel Efficiency Metric

26. WG/1 endorsed two options for fuel efficiency metrics:

- a. Liters of fuel consumed / Revenue Tonne Kilometers**
- b. Fuel Mass consumed / payload x distance**

27. WG/1 Members noted that the two metrics are similar, expressing essentially the same concept. Both apply equally to cargo as well as passengers.

28. The first option is widely used as a fuel efficiency metric all over the world and has the advantage of being well understood by industry and governments.

29. The second metric is being developed by CAEP. **WG/1 Members noted that, whether volume or mass is used in the metric for fuel efficiency, in future it will be important to develop appropriate conversion factors for different fuels, including the lower carbon footprint of alternative fuels.**

30. It was noted that different countries use different average weights for passengers for operational purposes. To convert passengers to tonnes, North America appears to use an average of 100 kgs per passenger, whereas different averages are used in Japan (75kg, 92.5kg and 102.5kg, depending on class and route) and in China (75kg). **WG/1 recommends that ICAO establish a standard average weight for passengers to be used in fuel efficiency metrics.**

31. For both metrics, **the distance measured should be the Great Circle Distance between airports**, rather than the actual distance flown. Use of the constant factor of Great Circle Distance ensures that all types of efficiency improvements (including improvements in air traffic management) are reflected in the metric.

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32. **In terms of a baseline against which fuel efficiency improvements would be measured, WG/1 recommends that a three-year average would provide a more accurate reflection** of an airline’s or Member State’s performance, rather than a single year.
33. Some concern was expressed regarding the availability of data to populate the metrics and WG/3 will be asked to address this issue. **WG/1 recommends that GIACC endorse a goal of putting in place comprehensive data collection on aviation emissions by no later than 2012.** WG/1 Members noted that measurement of progress against short-term fuel efficiency goals will have to be completed using existing data sources, while a more comprehensive system of data collection is put in place for the post-2012 monitoring period.
34. In addition, it may be necessary to clarify reporting requirements and guidance between the UNFCCC and ICAO in order to ensure standard and consistent reporting and minimize burden to those reporting.

Metric for Carbon-Neutral Growth

35. WG/1 discussed the technical issue of a metric for carbon neutral growth that would be expressed in terms of fuel efficiency. **Carbon-neutral growth will be achieved when the rate of fuel efficiency improvement is equal to the rate of increase in Revenue Tonne Kilometers.**
36. WG/1 was unable to reach consensus on further consideration of this issue (see also paragraphs 41-52. China disagrees with the concept of ICAO adopting a goal of carbon neutral growth at this time. France is of the opinion that the metric should also reflect the situation where aviation is part of an emissions trading scheme: carbon neutral growth would be achieved when all emissions from air operators above a fixed cap are compensated by reductions of emissions by other operators. The United States expressed the view that carbon-neutral growth can be achieved by 2025 through technological and operational improvements, in combination with use of alternative aviation fuels.

RECOMMENDED ASPIRATIONAL GOALS

Short Term Goals

37. **WG/1 recommends that ICAO adopt a collective annual aspirational fuel efficiency goal in the short term (i.e. to 2012) consistent with the historical rate of fuel efficiency improvement achieved by aviation from a particular baseline; the**

annual average rate of fuel efficiency improvement from 1990 to 2006 was proposed.

38. **WG/1 recommends that ICAO adopt an aspirational fuel efficiency goal to be achieved by 2012: that is, by 2012, the average fuel efficiency of international aviation will not exceed X Litres per 100 RTK.**
39. **WG/1 also recommends that ICAO adopt a short-term aspirational goal of Y% per year average rate of improvement in fuel efficiency to 2012 resulting in a total fuel efficiency improvement off XX% by 2012 (relative to the baseline chosen).**
40. Annex 1, which is based on ICAO data, illustrates what these goals would mean for annual fuel efficiency levels and the resulting absolute level of efficiency that would be achieved by 2012. Annex 1 is provided for illustrative purposes only and the data would need to be further validated if this approach were accepted by GIACC/3. Japan noted that if an absolute fuel efficiency goal were adopted, it should be based on actual data rather than calculated inputs based on certain assumptions.
41. It is hoped that all States would collectively commit to the global aspirational goals. These goals would not be attributed as specific obligations to individual States. It is understood that different circumstances in developing and developed States will affect how each contributes to the short-term global goal.
42. One of the objectives of the short-term goals is to communicate the impressive improvements the aviation industry has achieved.

Medium Term Goal

43. **WG/1 Members were unable to reach consensus on a fuel efficiency goal for the medium term.**
44. WG/1 Members note that IATA has adopted a medium-term goal of 25% fuel efficiency improvement over 2006 levels by 2020. The United States Air Transport Association has adopted a goal of 30% fuel efficiency improvement over 2006 levels by 2025.
45. France expressed the view that these fuel efficiency goals represent “business as usual” and therefore would not be sufficient to satisfy the UNFCCC process or European Ministers. France proposed that the historical rate of fuel efficiency improvement should be doubled in the future (2012 – 2020).
46. Several Members noted that the success of the GIACC process will likely be judged on the rigour of the medium-term goals adopted. These members take the view that

the recommended short-term goals may be viewed as insufficient, as they would simply continue the status quo.

47. Japan expressed the view that goals should be achievable; if the industry and Member States fail to meet the goals, ICAO would lose credibility. Goals should therefore be based on anticipated technological improvements, and other best endeavors.
48. The United States suggested that carbon neutral growth could be considered if 2025 is used as the medium term timeline.
49. The United States and China noted the importance of the UNFCCC process after COP15 in shaping medium and long-term goals. These Members take the view that any attribution to specific countries should occur in the UNFCCC process, not in ICAO.
50. WG/1 Members were unable to reach consensus on a year by which the international aviation sector should strive to achieve carbon-neutral growth.
51. **With respect to a goal of carbon neutral growth**, the general view of WG/1 Members was that **the need of developing countries for growth in their international aviation sectors needs to be respected in the design of the goals themselves**. The year in which developing countries may be able to reach carbon-neutral growth could be later than for developed countries. One consideration would be to set the goal of carbon neutrality at the same level of emissions in all countries, but allow developing countries more time to reach this goal.
52. China emphasized the need to develop its aviation sector; China is anticipating rapid growth in aviation over the next 5 to 10 years. To accommodate this concern, China proposed that the baseline should be set where China's per capita emissions reach the level of developed countries.
53. France expressed the view that the technological, operational and infrastructure improvements anticipated to the medium-term timeline of 2020 or 2025, are unlikely to be sufficient, in themselves, to achieve carbon-neutral growth on a global scale. Therefore, France suggests that the aviation sector will need access to offsetting, in the context of a cap-and-trade emission trading system, in order to achieve the goal of carbon neutral growth in the medium term. The United States' view is that carbon neutral growth can be achieved by 2025 as indicated in paragraph 36.
54. WG/1 suggests that, if consensus is not achieved by GIACC on a goal of carbon-neutral growth, GIACC should identify timelines and define expectations to enable ICAO to move this agenda forward.

Long Term Goals

55. WG/1 Members were unable to reach consensus on an aspirational goal for the long term, expressed in terms of fuel efficiency or in terms of absolute reductions in emissions.
56. There was general support for the following long-term relative goal, as a minimum: that **aviation continue to represent no more than 3% of the total greenhouse gas emissions globally in 2050**. It was noted that this relative goal could become a rigorous objective in the long term, depending on the emission reductions achieved in other sectors of the economy.
57. **With respect to a goal of absolute reductions in carbon emissions**, the general view of WG/1 Members is that **the need of developing countries for growth in their international aviation sectors needs to be respected in the design of the goals themselves**.
58. **WG/1 recommends that, if consensus is not reached by GIACC on long-term goals, GIACC should identify timelines and define expectations to enable ICAO to move this long-term agenda forward.**
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APPENDIX A

(English only)

Working Group One (WG/1) – Aspirational Goals to Report to GIACC/3

China was not able to participate in the finalization of the Annex due to scheduling conflicts.

Purpose:

In its report to GIACC/3, Working Group I (WG/1) recommends that GIACC adopt short-term aspirational goals that are consistent with the historical rate of fuel efficiency improvement achieved in international aviation from 1990 to 2006. (Paragraph 37)

The purpose of this Annex is to illustrate for GIACC Members what this could mean in terms of numeric short-term targets for international aviation.

Short-Term Goals:

Working Group I recommends that GIACC adopt two aspirational goals for the short term:

- 1) in 2012 the average fuel efficiency of international aviation will not exceed X liters of fuel consumed per 100 Revenue Tonne Kilometres performed; (paragraph 38) and
- 2) from 2010 to 2012, international aviation will continue to achieve the historic (1990-2006) rate of Y% average annual fuel efficiency improvement, resulting in a total industry improvement of XX% from 1990 to 2012 (paragraph 39).

Fuel efficiency is defined as Liters of Fuel Consumed per Revenue Tonne Kilometre. (paragraph 26)

Sources of Data:

Working Group I worked with ICAO's Economic Analysis and Databases Section (EAD) to identify the best available sources of data and methodologies to calculate the historical rate of fuel efficiency improvement for international aviation.

Using its fuel consumption model, ICAO/EAD calculated total fuel consumed in each year from 1990 to 2006. WG/1 notes that the model uses OAG planned flight data. An Information Paper on Aviation Data presented by ICAO/EAD to GIACC/2 (GIACC/2-IP/2) provides an overview of data issues and EAD modeling.

To calculate Revenue Tonne Kilometres, two different sources of data were considered. The first calculation (Method 1) uses Actual Revenue Tonne Kilometres, as reported by carriers to ICAO in its annual survey. The second calculation (Method 2) uses Official Airline Guide (OAG) planned activity data.

Industry-wide fuel efficiency was calculated for each year from 1990 to 2006; the average annual rate of fuel efficiency improvement was calculated from this; and the same rate of fuel efficiency improvement was projected forward to 2012. The results of these calculations are as follows:

Table 1: Fuel Efficiency Goals to 2012

	Method 1	Method 2
Liters of fuel per 100 RTK¹ in 2012	37.9	35.5
Average Annual Rate of Fuel Efficiency Improvement (1990-2012)²	2.1%	1.7%
Total Percentage Improvement in Fuel Efficiency in 2012 since 1990³	37.8%	31.5%

WG/1 notes that both calculations presented in Table I are imperfect, due to the lack of actual data on fuel consumption. A best approach to calculation of fuel efficiency would use actual data on fuel consumed and actual data on RTK performed. WG/1 therefore recommends that ICAO put in place comprehensive data collection on aviation emission no later than 2012 (Paragraph 33).

Nevertheless, the results shown in Table I are indicative of the general magnitude of fuel efficiency performance that could be used for the aspirational goals articulated in paragraphs 38 and 39 of the Working Group I report.

Industry Goals:

Working Group I notes that the numeric goals outlined in Table I are generally consistent with the short-term goals expressed by the Air Transport Action Group in its report to Working Groups 1 and 2.

Table 2: Comparison of ATAG 2012 Fuel Efficiency Goal with GIACC Working Group 1

	ATAG	WG1 Method 1	WG1 Method 2
Fuel Efficiency Improvement Goal (2005-2012)	15.0%	15.1%	11.8%
Average Annual Rate of Fuel Efficiency Improvement⁴	2.3%	2.1%	1.7%

¹ Revenue Tonne Kilometres is equivalent to Tonne Kilometres Performed.

² A three-year (1989-1991) average was used for the 1990 baseline to smooth any fluctuations in annual data.

³ A three-year (1989-1991) average was used for the 1990 baseline to smooth any fluctuations in annual data.

⁴ Annual Average Rate of Fuel Efficiency Improvement is calculated between 2005-2012 for ATAG; Methods 1 and 2 reflect WG/1 Report recommendations, i.e., the historical annual average fuel efficiency rate was applied to 2006-2012.

APPENDIX B
(English only)

**Working Group One (WG/1) – Aspirational Goals
Recommendations to GIACC/3**

Aspirational Goals

1. **WG/1 concluded that use of the term “aspirational goals” in our Terms of Reference should be interpreted as non-binding objectives** that would be agreed to collectively by Member States, without specific individual obligations.
2. **WG/1 Members agreed with setting non-binding short, medium and long-term aspirational goals for fuel efficiency.** That is, Member States of ICAO would commit to achieving the aspirational goals collectively, while *“acknowledging the principles of non-discrimination and equal and fair opportunities to develop international civil aviation set forth in the Chicago Convention, as well as the principles and provisions on common but differentiated responsibilities and respective capabilities under the UNFCCC and the Kyoto Protocol.”* (Appendix K, Preamble) This will require Member States to work with all aviation stakeholders to achieve results.

Timescales

3. **WG/1 recommends that GIACC consider timescales of 2012 for short-term goals, 2020 for medium-term goals and 2050 for long-term goals or other timelines as may be established in the United Nations Framework Convention on Climate Change (UNFCCC) process.**
4. **The general view of WG/1 Members was that a medium-term timeframe of 2025 would be acceptable to Member States as long as it was consistent with UNFCCC timelines and related arrangements.**
5. **WG/1 recommends that CAEP adjust its timelines for reporting and forecasting on international aviation and climate change to coincide with UNFCCC timelines, wherever possible.**

Reporting and Accountability

6. **WG/1 recommends that ICAO establish rigorous annual reporting, by Member States, on fuel consumption and fuel efficiency. ICAO should publish the results,** in order to provide transparency on performance of the aviation sector.

7. **Since the goals would be aspirational only, accountability would be achieved through reporting requirements, and publication of these results. Some WG/1 Members suggest that a minimum threshold be identified, to distinguish between those countries with strong international aviation sectors (who would be required to report to ICAO on progress) and those with smaller impact.**
8. **WG/1 recommends that GIACC endorse a goal of putting in place comprehensive data collection on aviation emissions by no later than 2012.**

Special Needs of Developing Countries

9. **It will be important to ensure that GIACC's Programme of Action covers the spectrum of needs of developing countries.**
10. **All WG/1 Members agreed that financial support for infrastructure development; capacity building and technology transfer are important measures to address the special needs of developing countries.**
11. **WG/1 suggests that ICAO and ICAO Member States seek expansion of the UNFCCC Clean Development Mechanism to include investments in international aviation projects in developing countries.**

Fuel Efficiency Goals

12. **Most WG/1 Members are of the view that fuel efficiency goals should apply equally to all countries.**
13. **WG/1 endorsed two options for fuel efficiency metrics:**
 - a. **Liters of fuel consumed / Revenue Tonne Kilometers**
 - b. **Fuel Mass consumed / payload x distance**
14. **WG/1 Members noted that, whether volume or mass is used in the metric for fuel efficiency, in future it will be important to develop appropriate conversion factors for different fuels, including the lower carbon footprint of alternative fuels.**
15. **WG/1 recommends that ICAO establish a standard average weight for passengers to be used in fuel efficiency metrics.**

16. For both metrics, **the distance measured should be the Great Circle Distance between airports**, rather than the actual distance flown.
17. **In terms of a baseline against which fuel efficiency improvements would be measured, WG/1 recommends that a three-year average would provide a more accurate reflection** of an airline's or Member State's performance.
18. **WG/1 recommends that ICAO adopt a collective annual aspirational fuel efficiency goal in the short term (i.e. to 2012) consistent with the historical rate of fuel efficiency improvement achieved by aviation from a particular baseline; the annual average rate of fuel efficiency improvement from 1990 to 2006 was proposed.**
19. **WG/1 recommends that ICAO adopt an aspirational fuel efficiency goal to be achieved by 2012: that is, by 2012, the average fuel efficiency of international aviation will not exceed X Liters per 100 RTK.** NOTE: Preliminary analysis indicates that this goal would be in the order of 36-39 liters per 100 RTK – see Annex to Working Group 1 report.
20. **WG/1 also recommends that ICAO adopt a short-term aspirational goal of Y% per year average rate of improvement in fuel efficiency to 2012 resulting in a total fuel efficiency improvement off XX% by 2012 (relative to the baseline chosen).** NOTE: Preliminary analysis indicates that the average annual rate of fuel efficiency improvement would be in the order of 1.7%-2.1% per year – see Annex to WG/1 Report.

Medium-term Goals

21. **WG/1 Members were unable to reach consensus on a fuel efficiency goal for the medium term.**
22. **Carbon-neutral growth will be achieved when the rate of fuel efficiency improvement is equal to the rate of increase in Revenue Tonne Kilometers.**
23. **With respect to a goal of carbon neutral growth, the general view of WG/1 Members was that the need of developing countries for growth in their international aviation sectors needs to be respected in the design of the goals themselves.**
24. **WG/1 suggests that, if consensus is not achieved by GIACC on a goal of carbon-neutral growth, GIACC should identify timelines and define expectations to enable ICAO to move this agenda forward.**

Long-term Goals

25. There was general support for the following long-term relative goal, as a minimum: that **aviation continue to represent no more than 3% of the total greenhouse gas emissions globally in 2050.**
26. **With respect to a goal of absolute reductions in carbon emissions,** the general view of WG/1 Members is that **the need of developing countries for growth in their international aviation sectors needs to be respected in the design of the goals themselves.**
27. **WG/1 recommends that, if consensus is not reached by GIACC on long-term goals, GIACC should identify timelines and define expectations to enable ICAO to move this long-term agenda forward.**

Priority Measures

28. **WG/1 recommends that ICAO adopt a resolution and provide guidance to Member States on the priority measures that are developed by Working Group 2 for addressing emissions.**

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