

# ICAO Programme Of Action On International Aviation and Climate Change

By *ICAO Secretariat*

At the 36<sup>th</sup> Session of the ICAO Assembly in September 2007, the 190 ICAO Member States recognized the urgency and critical importance of addressing greenhouse gas (GHG) emissions from international aviation that contribute to global climate change. They also re-emphasized the need for ICAO to continue to provide effective leadership in this area.

To achieve this, the Assembly called for the formation of the Group on International Aviation and Climate Change (GIACC) with the mandate to develop an ICAO Programme of Action on International Aviation and Climate Change. The Assembly directed the Organization to develop concrete proposals to aid the United Nations Framework Convention on Climate Change (UNFCCC) process, and additionally, it requested that ICAO convene a High-level Meeting (HLM) on International Aviation and Climate Change, at which the GIACC recommendations would be considered.

## Group on International Aviation and Climate Change

The GIACC was formed in January 2008. It was comprised of 15 senior government officials representative of all ICAO Regions. GIACC deliberated and made decisions by consensus and technical support was provided by the ICAO Committee on Aviation Environmental Protection (CAEP).

The fourth and final meeting of the GIACC took place at the end of May 2009. Consistent with the ICAO Assembly Resolution, the following three key elements of an effective Programme of Action for global aviation were presented:

- Global aspirational fuel-efficiency goals;
- Suggested measures to achieve emissions reductions; and
- Suggested methods and metrics to measure aviation's progress.

The GIACC proposals were accepted by the ICAO Council, which also made recommendations on the way forward, including the convening of the HLM in October 2009 and a Global Conference on Alternative Fuels for Aviation in November 2009.

## High-level Meeting on International Aviation and Climate Change

ICAO held the HLM on International Aviation and Climate Change in October 2009 with the participation of representatives from 73 Member States (accounting for 94 % of global commercial air traffic), and from various international organizations. The HLM evaluated the outcome of the GIACC and discussed areas where progress could be achieved on the formulation of proposals to address greenhouse gas emissions from international aviation.

The meeting approved a Declaration and further recommendations (see complete text at the end of this chapter) affirming the commitment of Member States to address aviation emissions that contribute to climate change by working through ICAO. This is the first globally-harmonized agreement on a goal that addresses climate impacts from a specific sector. The ICAO Programme of Action on International Aviation and Climate Change includes the following elements:

- A 2% annual improvement target in fuel efficiency globally until the year 2050;
- A decision to develop global CO<sub>2</sub> Standards for aircraft;
- A decision to develop a framework for market-based measures for international aviation;
- Measures to assist developing States and to facilitate access to financial resources, technology transfer, and capacity-building;

- Collection of international aviation emissions data by ICAO;
- Development and submissions to ICAO of States' Voluntary Action Plans on Emissions; and
- Continued work on alternative fuels for aviation.

The HLM also agreed to continue working on medium-term and long-term goals, including exploring the feasibility of more ambitious objectives such as carbon-neutral growth and emissions reductions, taking into account the special circumstances and respective capabilities of developing countries and the sustainable growth of the industry. It also emphasized that such fuel efficiency improvements or other emission reduction goals would not attribute specific obligations to States.

In order to monitor progress towards reaching the goals, the Declaration provides for States, on a voluntary basis, to develop and submit action plans, outlining their respective policies and actions, and annual reporting of data on their aviation fuel consumption to ICAO. Using this information, ICAO could identify specific needs of countries and assist them by facilitating access to financial resources and technologies needed to enable them to contribute to the global efforts to address greenhouse gas emissions from international aviation.

### **Conference on Aviation and Alternative Fuels**

Complementary to the GIACC and HLM, ICAO also held a Conference on Aviation and Alternative Fuels (CAAF) in November 2009. This was an important step towards promoting an improved understanding of the potential use and emission effects of sustainable alternative fuels, and to facilitating their development and deployment. The Conference endorsed the use of sustainable alternative fuels for aviation, particularly the use of drop-in fuels in the short- to medium-term, as an important means of reducing aviation greenhouse gas emissions.

The Conference noted that the introduction of sustainable alternative fuels for aviation will help address, not only environmental issues, but also those of economics, and supply security. There is currently very limited availability of qualified alternative fuels for aviation. However, it has been demonstrated that sustainable alternative fuels for

use in global aviation can be produced from a wide variety of feedstocks, suggesting that many regions are possible production locations. Those alternative fuels have the potential to offer reduced lifecycle CO<sub>2</sub> emissions compared with conventional aviation fuels.

The Declaration and Recommendations approved by the Conference (see Chapter 5 of this report) affirmed the commitment of States and industry groups to develop, deploy and use sustainable alternative fuels to reduce aviation emissions. To facilitate the promotion and harmonization of initiatives that encourage and support the development of sustainable alternative fuels for aviation, on a global basis, the Conference established an ICAO Global Framework for Aviation Alternative Fuels<sup>1</sup>.

### **Towards the 37<sup>th</sup> ICAO Assembly Session**

ICAO was able to bring its 190 member States together and adopt the Programme of Action on International Aviation and Climate Change, and then provide it to COP15. This was the first and only globally-harmonized agreement from a sector on a goal to address its CO<sub>2</sub> emissions. However, due to the complex negotiating process that took place at COP15, this substantial agreement was not considered as a basis for negotiations on international bunker fuels and no specific decision was taken on how to address GHG emissions from international aviation (see Chapter 8 of this report).

The parallel tracks to an agreement on climate change taken by UNFCCC and ICAO are illustrated in **Figure 1**.

ICAO followed the process established by the 36<sup>th</sup> session of the Assembly in September 2007 to develop the Programme of Action, while the UNFCCC followed the decisions taken at COP13 in Bali in December 2007 for the preparation of the new climate agreement post-2012.

In light of this outcome, ICAO has continued to make further progress on the recommendations of the High-level Meeting and the Alternative Fuels Conference, toward the development of proposals for more ambitious policies on international aviation and climate change.

To facilitate the progress, ICAO established a process and initiated the preparation of the Assembly Resolution on international aviation and climate change.

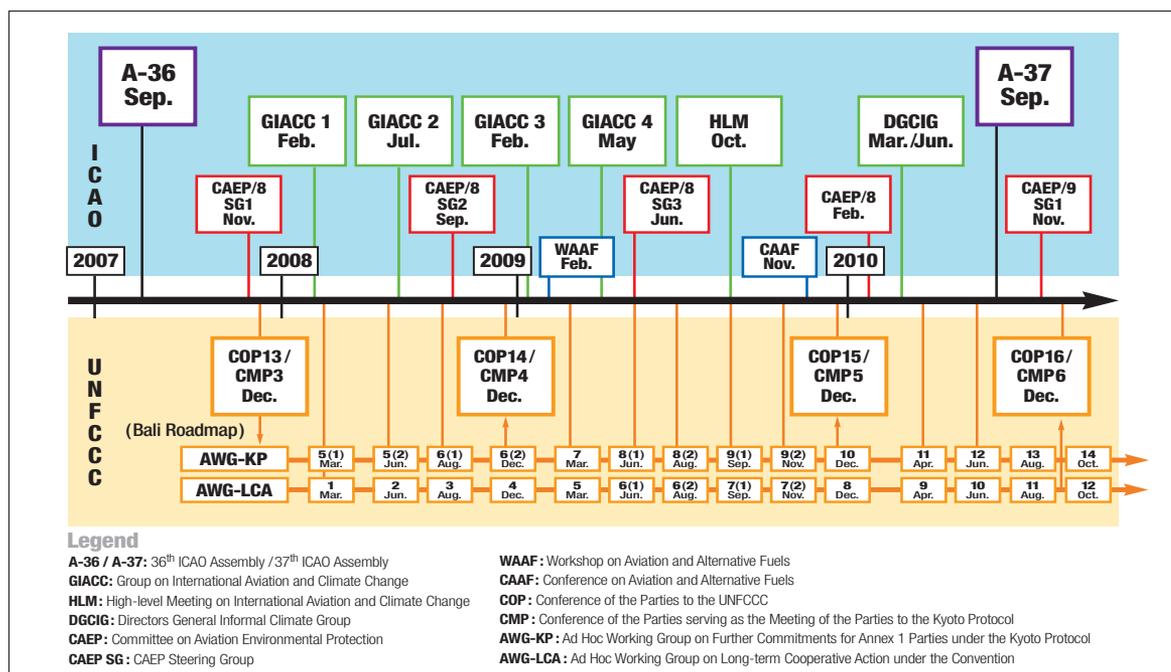


Figure 1: Climate change negotiation process.

Three main areas where further progress was sought were:

1. Exploring the feasibility of more ambitious goals including carbon-neutral growth of the sector and long-term emission reductions, moving beyond the global commitment of a 2 per cent annual fuel efficiency improvement up to 2050;
2. Developing a framework for market-based measures in international aviation; and
3. Elaborating on measures to assist States, in particular developing States, in gaining access to financial resources, technology transfer, and capacity building; taking into account the special needs and circumstances of all member States.

ICAO will continue to exercise its leadership in all matters related to international aviation, including the limitation or reduction of greenhouse gas emissions. This shall be addressed under a globally harmonized framework, with all member States and the air transport industry working together through ICAO. ■

## REFERENCES

- 1 [www.icao.int/AltFuels](http://www.icao.int/AltFuels)

ICAO also started discussions on the need to address the potential impacts of climate change on international operations and related infrastructure. Rising sea levels will threaten land facilities, including airports and fuel storage areas, while changes in weather and/or unexpected weather patterns may substantially affect aviation operations (see Chapter 6 of this report).

## Declaration by the HLM-ENV

The High-Level Meeting on International Aviation and Climate Change, convened by the International Civil Aviation Organization (ICAO) at its Headquarters in Montreal on 7 to 9 October 2009 was attended by Ministers and other high-level officials representing 73 States (responsible for 94% of the global international aviation traffic<sup>1</sup>) and 26 international organizations:

*Whereas* the 36th Session of the ICAO Assembly requested the Council to convene a high-level meeting to review the Programme of Action on International Aviation and Climate Change recommended by the Group on International Aviation and Climate Change, taking into account that the fifteenth meeting of the Conference of the Parties (COP15) of the United Nations Framework Convention on Climate Change (UNFCCC) will be held in December 2009;

*Welcoming* the Decision of the ICAO Council to fully accept the Programme of Action on International Aviation and Climate Change, which includes global aspirational goals in the form of fuel efficiency, a basket of measures and the means to measure progress, as an important first step in the work of Member States at ICAO to address greenhouse gas (GHG) emissions from international aviation;

*Reaffirming* ICAO as the lead United Nations agency in matters involving international civil aviation, and *emphasizing* ICAO's commitment to provide continuous leadership in addressing international civil aviation matters related to the environment;

*Acknowledging* the principles and provisions on common but differentiated responsibilities and respective capabilities, and with developed countries taking the lead under the UNFCCC and the Kyoto Protocol;

*Also acknowledging* the principles of non-discrimination and equal and fair opportunities to develop international aviation set forth in the Chicago Convention;

*Reemphasizing* the vital role which international aviation plays in global economic and social development and the need to ensure that international aviation continues to develop in a sustainable manner;

*Acknowledging* that international aviation emissions, currently accounting for less than 2 per cent of total global CO<sub>2</sub> emissions, are projected to grow as a result of the continued development of the sector;

*Recognizing* that the international aviation sector must play its part to confront the global challenge of climate change, including by contributing to the reduction of global GHG emissions;

*Noting* the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C;

*Noting* the continuous efforts of the sector to minimise aviation's impact on climate change and the improvement in fuel efficiency achieved over the last 40 years, resulting in aircraft today that are 70 per cent more fuel efficient per passenger kilometre;

*Affirming* that addressing GHG emissions from international aviation requires the active engagement and co-operation of States and the industry, and noting the collective commitments announced by ACI, CANSO, IATA and ICCAIA on behalf of the international air transport industry to continuously improve CO<sub>2</sub> efficiency by an average of 1.5 per cent per annum from 2009 until 2020, to achieve carbon neutral growth from 2020 and reducing its carbon emissions by 50 per cent by 2050 compared to 2005 levels;

*Recognizing* the different circumstances among States in their capacity to respond to the challenges associated with climate change and the need to provide necessary support, in particular to developing countries and States having particular needs;

*Recognizing* that the aspirational goal of 2 per cent annual fuel efficiency improvement is unlikely to deliver the level of reduction necessary to stabilize and then reduce aviation's absolute emissions contribution to climate change, and that goals of more ambition will need to be considered to deliver a sustainable path for aviation;

### **Declares that:**

**1.** The HLM endorses the ICAO Programme of Action on International Aviation and Climate Change as accepted by the ICAO Council;

**2.** In pursuing the implementation of the ICAO Programme of Action on International Aviation and Climate Change, States and relevant organizations will work through ICAO to achieve a global annual average fuel efficiency improvement of 2 per cent over the medium term until 2020 and an aspirational global fuel efficiency improvement rate of 2 per cent per annum in the long term from 2021 to 2050, calculated on the basis of volume of fuel used per revenue tonne kilometre performed;

**3.** Taking into account the relevant outcomes of the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change, and recognizing that this declaration shall not prejudice the outcome of those negotiations, ICAO and its Member States, with relevant organizations will also keep working together in undertaking further work on medium and long-term goals, including exploring the feasibility of goals of more ambition including carbon-neutral growth and emissions reductions, taking into account the collective commitments announced by ACI, CANSO, IATA and ICCAIA on behalf of the international air transport industry, the special circumstances and respective capabilities of developing countries and the sustainable growth of the international aviation industry, for consideration by the 37th Session of the ICAO Assembly;

**4.** Such fuel efficiency improvements or other aspirational emission reduction goals 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 the global aspirational goals;

**5.** ICAO will establish a process to develop a framework for market based measures in international aviation, taking into account the conclusions of the High-level Meeting and outcome of the UNFCCC COP 15 and bearing in mind relevant ICAO Assembly resolutions and the appendices with a view to complete this process expeditiously;

**6.** ICAO will regularly report CO<sub>2</sub> emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementation actions in the sector based on information approved by its Member States;

**7.** States are encouraged to submit their action plans, outlining their respective policies and actions, and annual reporting on international aviation CO<sub>2</sub> emissions to ICAO;

**8.** ICAO and its Member States will strongly encourage wider discussions on the development of alternative fuel technologies and the promotion of the use of sustainable alternative fuels, including biofuels, in aviation in accordance with national circumstances.

<sup>1</sup> expressed in revenue passenger kilometres.

## Recommendations by the HLM-ENV

In addition to the recommendations from the GIACC as accepted by the Council, the High-level Meeting on International Aviation and Climate Change recommended, in order to progress the work leading to the upcoming 37th Session of the ICAO Assembly in 2010 and beyond, that the ICAO Council:

1. *Work* expeditiously together with the industry to foster the development and implementation of more energy efficient aircraft technologies and sustainable alternative fuels for aviation;
2. *Seek to develop* a global CO<sub>2</sub> Standard for new aircraft types consistent with CAEP recommendations;
3. *Continue* to maintain and update knowledge of the interdependency between noise and emissions in the development and implementation of measures to address GHG emissions from international aviation;
4. *Continue* to work with relevant organizations on the scientific understanding and on measures to limit the non-CO<sub>2</sub> climate impacts of aviation;
5. *Intensify* its efforts in further development of Standards and Recommended Practices for technological and operational measures to reduce international aviation emissions, with the support and expertise from technical panels and committees of ICAO, in consultation with other relevant organizations, in particular on the development of new guidance on operational measures to reduce international aviation emissions;
6. *Commit*, in cooperation with the industry, to facilitate the implementation of operational changes and the improvement of air traffic management and airport systems aiming to reduce emissions from international aviation sector;
7. *Further elaborate* on measures to assist developing States as well as to facilitate access to financial resources, technology transfer and capacity building including possible application of flexible mechanisms under UNFCCC, such as the Clean Development Mechanism (CDM), to international aviation;
8. *Encourage* States and international organizations to actively participate in the Conference on Aviation and Alternative Fuels in Rio de Janeiro in November 2009 (CAAF2009) to share their efforts and strategies to promote such measures, and bring its results to COP15;
9. *Identify* appropriate standard methodologies and a mechanism to measure/estimate, monitor and verify global GHG emissions from international aviation, and States support the work of ICAO on measuring progress through the reporting of annual data on traffic and fuel consumption;
10. *Request* States to continue to support the efforts of ICAO on enhancing the reliability of measuring/estimating global GHG emissions from international aviation;
11. *Consider* a de-minimis exception for States which do not have substantial international aviation activity levels, in the submission of action plans and regular reports on aviation CO<sub>2</sub> emissions to ICAO;
12. *Consider*, with due priority, the allocation of resources for environment-related activities under the next ICAO Regular Programme budget and analyse the possibility of establishing voluntary contributions;
13. *Explore* the relevance of the GIACC's fuel efficiency metric to international business aviation;
14. *Explore* approaches for providing technical and financial assistance in the reporting process to developing countries; and
15. *Invite* the international air transport industry to further elaborate the implementation framework and strategies for the collective commitment of the international air transport industry.

# Assembly Resolution on International Aviation and Climate Change (A37-19)

By **Jane Hupe**, Chief, Environment Branch



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## Overview

The 37<sup>th</sup> Session of the ICAO Assembly that took place from 28 September to 8 October 2010 adopted Resolution A37-19: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change* (see the complete Resolution text at the end of this article).

ICAO was able to bring its 190 member States together and adopted a comprehensive and global policy on how to address GHG emissions from international aviation. The Resolution A37-19 reflects the determination of ICAO's member States to continue to play a leading role in the global efforts to address climate change by working through ICAO to limit or reduce GHG emissions from international aviation, identifying a global solution while taking into account the special needs and circumstances of its member States.

Building upon the series of ICAO's past achievements since the 36<sup>th</sup> Session of the ICAO Assembly, including the Declaration and Recommendations approved by the High-level Meeting in October 2009, the Resolution goes one step further by incorporating important key elements, such as:

- further endorsement of the global aspirational goal of 2 per cent annual fuel efficiency improvement up to year 2050;
- a medium-term global aspirational goal from 2020 that would ensure that while the international aviation sector continues to grow, its global CO<sub>2</sub> emissions would be stabilized at 2020 levels;
- further work to explore the feasibility of a long-term global aspirational goal for international aviation;
- development of a framework for market-based measures, including further elaboration of the guiding principles adopted by the Assembly, and exploration of a global scheme for international aviation;
- concrete steps to assist States to contribute to the global efforts;
- *de minimis* provisions to ensure that States with small contributions to the global air traffic are not burdened disproportionately; and
- States' action plans, covering information on CO<sub>2</sub> emissions reduction activities and assistance needs.

The Assembly also decided that the Council should undertake further work in order to continue to progress on a number of issues contained in Resolution A37-19, where States expressed concerns, such as the implementation of the medium term global aspirational goal and market-based measures including the *de minimis* provision. Some States filed reservations on these aspects.

The work programme agreed by the Assembly indicates the shift of the Organization in the field of international aviation and climate change from the “Standard policy setting” into the “implementation” phase. This was the case for aviation safety and security, where the Organization identified specific areas for improvement through its Audit Programmes and supported States’ efforts in effectively addressing these areas. In the case of climate change, it will be the voluntary Action Plans, which will allow States to identify their basket of measures and assistance needs, and allow ICAO to monitor the progress towards reaching the global goals and to address specific needs of States towards facilitating technical and financial assistance.

### The Process

To facilitate progress on the drafting of the Resolution text, an informal group was established during the Assembly. The group undertook substantive discussions in the true spirit of cooperation, and it was able to make progress towards bridging the different views in the drafting of the Resolution text.

This Resolution makes international aviation the first sector with a shared global commitment to the environmental goals of increasing fuel efficiency and stabilizing its global CO<sub>2</sub> emissions in the medium-term. It reflects the collective determination of ICAO’s member States to contribute to the global efforts on climate change and provides an ambitious work programme over the next triennium and beyond.

### Resolution A37-19 earned the applause of the international community:

The US Department of State called the Resolution on climate change an unprecedented global commitment to collective action among the countries of the world, both developed and developing, toward aviation CO<sub>2</sub> reduction.

Siim Kallas, EU vice-president and commissioner for transport, hailed this agreement and said “this deal is very significant because at a global level, governments and the aviation industry have for the first time agreed to cap greenhouse emissions from 2020. It is the first time any transport sector has been able to reach this kind of deal.”

Giovanni Bisignani, IATA’s Director General and CEO, lauded the Resolution as “historic” and “a good first step that prepares the way for future achievements,” as did several other national and multilateral entities.

### Sound Policies based on Sound Information

Throughout the discussions leading to the Resolution, States requested information on the historic and current levels of international aviation activity. **Tables 1** and **2**, and **Figure 1**, are a sample of the information that was provided. The data are based on the total revenue tonne kilometre (RTK), a function of the number of passengers / amount of cargo and distance travelled, as reported each year in the ICAO Annual Report of the Council. The data demonstrate that the States with the largest activity levels historically (1974-2009) are, in general, the same States with the largest activity levels currently. In addition, the last 20 years of international air travel has been 4 times greater than the 20 years before that. The tables also show that a relatively small number of States account for 90% of the cumulative international aviation traffic.

Rank	State	RTK (million)	% Share	Cumulative %
1	United States	1,046,865.2	17.04	17.04
2	United Kingdom	509,268.8	8.29	25.33
3	Germany	412,499.7	6.72	32.05
4	Japan	348,320.9	5.67	37.72
5	France	309,518.1	5.04	42.76
6	China	270,553.0	4.40	47.16
7	Singapore	259,758.7	4.23	51.39
8	Netherlands	250,286.0	4.07	55.47
9	Republic of Korea	248,588.4	4.05	59.51
10	Australia	156,882.8	2.55	62.07
11	Canada	137,658.6	2.24	64.31
12	United Arab Emirates	117,850.9	1.92	66.23
13	Thailand	113,513.0	1.85	68.08
14	Italy	111,318.4	1.81	69.89
15	Switzerland	100,530.7	1.64	71.52
16	Spain	99,165.4	1.61	73.14
17	Malaysia	89,338.4	1.45	74.59
18	Russian Federation	75,598.8	1.23	75.82
19	Brazil	72,986.0	1.19	77.01
20	Scandinavia	66,751.1	1.09	78.10
21	New Zealand	61,232.3	1.00	79.10
22	India	59,504.2	0.97	80.06
23	Israel	57,998.1	0.94	81.01
24	Saudi Arabia	55,803.2	0.91	81.92
25	Ireland	52,158.1	0.85	82.77
26	Luxembourg	51,740.9	0.84	83.61
27	South Africa	47,712.2	0.78	84.39
28	Belgium	43,580.6	0.71	85.09
29	Philippines	40,935.2	0.67	85.76
30	Mexico	40,013.3	0.65	86.41
31	Turkey	35,758.4	0.58	86.99
32	Chile	35,146.6	0.57	87.57
33	Pakistan	34,776.4	0.57	88.13
34	Indonesia	34,180.4	0.56	88.69
35	Austria	32,119.6	0.52	89.21
36	Portugal	30,659.9	0.50	89.71
37	Colombia	28,128.1	0.46	90.17

Table 1. States' Ranking of Cumulative International Aviation Traffic (1974 to 2009 RTK) up to 90%.

Rank	State	RTK (million)	% Share	Cumulative %
1	United States	54,371.9	15.14	15.14
2	China	28,789.5	8.02	23.15
3	Germany	26,243.2	7.31	30.46
4	United Kingdom	22,781.8	6.34	36.80
5	United Arab Emirates	21,822.0	6.08	42.88
6	France	17,178.0	4.78	47.66
7	Republic of Korea	15,588.6	4.34	52.00
8	Netherlands	13,111.3	3.65	55.65
9	Singapore	12,972.9	3.61	59.26
10	Japan	12,664.9	3.53	62.79
11	Ireland	8,007.9	2.23	65.02
12	Canada	6,941.6	1.93	66.95
13	Australia	6,923.5	1.93	68.88
14	Thailand	6,538.7	1.82	70.70
15	Spain	6,360.8	1.77	72.47
16	Qatar	5,621.0	1.56	74.03
17	Malaysia	5,250.5	1.46	75.50
18	Russian Federation	5,168.4	1.44	76.94
19	India	5,085.5	1.42	78.35
20	Turkey	4,855.3	1.35	79.70
21	Luxembourg	4,688.0	1.31	81.01
22	Switzerland	4,008.6	1.12	82.12
23	Italy	3,494.2	0.97	83.10
24	New Zealand	3,061.7	0.85	83.95
25	Saudi Arabia	2,901.6	0.81	84.76
26	Brazil	2,463.7	0.69	85.44
27	Israel	2,332.5	0.65	86.09
28	Mexico	2,332.4	0.65	86.74
29	South Africa	2,295.6	0.64	87.38
30	Chile	2,203.6	0.61	87.99
31	Portugal	2,160.9	0.60	88.60
32	Colombia	1,944.1	0.54	89.14
33	Finland	1,907.6	0.53	89.67
34	Austria	1,879.3	0.52	90.19

Table 2. States' Ranking of International Aviation Traffic (2009 RTK) up to 90%.

Rank	State	RTK (million)	Population (000)	RTK (000) per Capita
1	United Arab Emirates	21,822.00	4,707.31	4.64
2	Qatar	5,620.97	1,508.32	3.73
3	Nauru	37.97	10.25	3.70
4	Singapore	12,972.87	4,836.69	2.68
5	Bahrain	1,670.00	807.13	2.07
6	Iceland	431.36	329.28	1.31
7	Brunei Darussalam	399.37	407.05	0.98
8	New Zealand	3,061.66	4,303.46	0.71
9	Switzerland	4,008.56	7,594.56	0.53
10	Fiji	381.34	854.10	0.45

Table 3. States' Ranking of International Aviation Traffic (2009 RTK per Capita), Top 10.

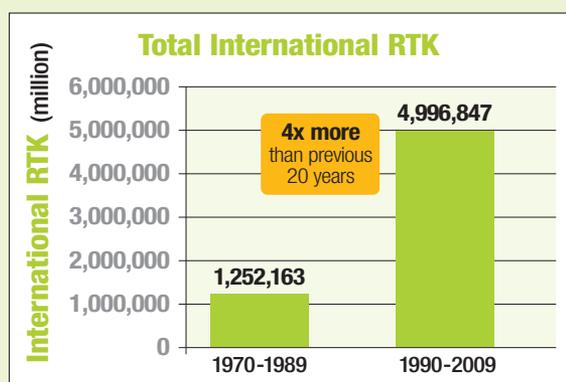


Figure 1. Total International Aviation Traffic (1970 to 2009 RTK).

During the discussions, the Secretariat also received a request for data on the per Capita level of international aviation traffic. These results are presented in Table 3. This table presents a very different picture than the previous 2 tables, with island States and States that have few alternatives to aviation appearing at the top of the list. The population data in Table 3 was obtained from the United Nations Population Division.

### Challenges and Next Steps

With the ambitious work programme agreed by the Assembly, as contained in Resolution A37-19 and the Assembly decisions, ICAO and its member States in collaboration with the air transport industry will continue to work actively towards defining a global solution to address GHG emissions from international aviation. The following provides a summary of the key areas where further progress will be needed in the next triennium.

### Global aspirational goals

The Assembly resolved that “ICAO’s member States and 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.” This medium term goal, together with the 2 per cent annual fuel efficiency goal up to year 2050 “would not attribute specific obligations to individual States, and 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 voluntarily contribute to achieving the global aspirational goals,” while the provisions related to medium term goal also include that “some States may take more ambitious actions prior to 2020, which may offset an increase in emissions from the growth of air transport in developing States.”

In this regard, the Assembly also agreed to review, at its 38<sup>th</sup> Session, the medium term goal in light of progress towards the goal, new studies regarding the feasibility of achieving the goal, and relevant information from States to be provided through their action plans.

### Market-based measures

The Assembly adopted the guiding principles that it urges States to respect when designing new and implementing existing market-based measures for international aviation. It also urges States to engage in constructive bilateral and/or multilateral consultations and negotiations with other States to reach an agreement. The Council was requested to undertake further work to elaborate on these guiding principles. The

Assembly also resolved on a *de minimis* threshold of international aviation activity of 1 per cent of total revenue ton kilometres for the application of market-based measures. During the Assembly, concerns were expressed regarding possible market distortions arising from this *de minimis* threshold.

In this connection, the Assembly requested the Council to review the *de minimis* threshold to market-based measures, taking into account specific circumstances of States and potential impacts on the aviation industry and markets, and with regard to the guiding principles, by the end of 2011.

### States' action plans

The Assembly Resolution encourages States to submit their action plans outlining their respective policies and actions, and annual reporting on international aviation CO<sub>2</sub> emissions to ICAO. It also invites those States that choose to prepare their action plans to submit them to ICAO as soon as possible preferably by the end of June 2012, and the action plans should include information on the basket of measures considered by States, reflecting their respective national capacities and circumstances, and information on any specific assistance needs. It further requests the Council to provide guidance and other technical assistance for the preparation of States' action plans.

Several States have already expressed the need for further information and guidance, offered their case studies, and volunteered to be case studies for the preparation of States' action plans. ICAO is developing guidance and templates and will conduct training in the form of regional workshops in 2011, aimed at assisting States to prepare their action plans and submit them to ICAO by the end of June 2012.

### Assistance to States

The Assembly agreed on concrete steps to assist States to contribute to the global efforts in addressing GHG emissions from international aviation. The Resolution requests the Council to study, identify and develop processes and mechanisms to facilitate the provision of technical and financial assistance, as well as facilitate access to existing and new financial resources, technology transfer and capacity building to developing countries, and report on its progress, including processes and mechanisms developed, results achieved as well as further recommendations, preliminarily by the end of 2012 and at the 38<sup>th</sup> Session of the Assembly. It also requests

the Council to initiate specific measures to assist developing States as well as to facilitate access to financial resources, technology transfer and capacity building.

### Alternative fuels for aviation

In 2009, ICAO organized a Workshop and a Conference on sustainable alternative fuels for aviation to promote improved understanding of the potential use and emission effects of those fuels and to facilitate their development and deployment. To facilitate, on a global basis, the promotion and harmonization of initiatives that encourage and support the development of sustainable alternative fuels for aviation, the Conference established a Global Framework for Aviation Alternative Fuels (GFAAF), a web-based living document that is updated whenever new information is provided by States and international organizations.

The Assembly Resolution requests States to develop policy actions to accelerate the appropriate development, deployment and use of sustainable alternative fuels for aviation, and work together through ICAO and other relevant international bodies to exchange information and best practices. It also requests States to consider measures to support sustainable aviation alternative fuels research and development, investments in new feedstock cultivations and production facilities, as well as incentives to stimulate commercialisation and use of sustainable alternative fuels for aviation to accelerate the reduction of aviation CO<sub>2</sub> emissions.

The Resolution also requests the Council to encourage member States and invite industry to actively participate in further work on sustainable alternative fuels for aviation. It also requests the Council to work with financial institutions to facilitate access to financing infrastructure development projects dedicated to sustainable aviation alternative fuels and incentives to overcome initial market hurdles.

### Technical Standards and guidance

The ICAO Committee on Aviation Environmental Protection (CAEP) will continue to play a vital role in providing its technical support for the future work of the Council. For example, CAEP is expected to develop a global CO<sub>2</sub> Standard for aircraft aiming for 2013, and work is underway in CAEP to update Circular 303 as the information contained in the document will serve as an important basis for States in preparing their action plans.

### **Cooperation with other UN Bodies**

The Assembly requested the Council to continue to cooperate with other international organizations involved in policy-making in this field, notably with the UNFCCC. The outcome of the Assembly will be presented to the UNFCCC Climate Change Conference in December 2010 in Cancun, Mexico, and ICAO will keep the UNFCCC and other UN bodies informed of any further progress by the Organization on international aviation and climate change.

### **Conclusion**

ICAO has been working actively towards developing a global solution to address CO<sub>2</sub> emissions from international aviation. The ICAO Assembly Resolution A37-19 is a clear demonstration of the willingness of its member States to take concrete steps towards a global solution. It represents a big challenge, but provides an array of opportunities as ICAO moves forward in demonstrating to the world how it intends to achieve the ultimate objective of environmentally sustainable international aviation. ■

*ICAO Assembly Resolution A37-19 is a clear demonstration of the willingness of its 190 member States to take concrete steps towards a global solution to address CO<sub>2</sub> emissions from international aviation. We look to the UNFCCC process to deliver an agreement that acknowledges ICAO's significant achievements and encourages its member States to continue to work further through ICAO towards the sustainable development of international civil aviation.*

## Resolution A37-19: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change

*Whereas* ICAO and its member States recognize the critical importance of providing continuous leadership to international civil aviation in limiting or reducing its emissions that contribute to global climate change;

*Reemphasizing* the vital role which international aviation plays in global economic and social development and the need to ensure that international aviation continues to develop in a sustainable manner;

*Whereas* the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system;

*Whereas* the Kyoto Protocol, which was adopted by the Conference of the Parties to the UNFCCC in December 1997 and entered into force on 16 February 2005, calls for developed countries (Annex I Parties) to pursue limitation or reduction of greenhouse gases from "aviation bunker fuels" (international aviation) working through ICAO (Article 2.2);

*Acknowledging* that international aviation emissions, currently accounting for less than 2 per cent of total global CO<sub>2</sub> emissions, are projected to grow as a result of the continued development of the sector;

*Whereas* a comprehensive assessment of aviation's impact on the atmosphere is contained in the special report on *Aviation and the Global Atmosphere*, published in 1999, which was prepared at ICAO's request by the Intergovernmental Panel on Climate Change (IPCC) in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer;

*Whereas* the IPCC special report recognized that the effects of some types of aircraft emissions are well understood, it revealed that the effects of others are not, and identified a number of key areas of scientific uncertainty that limit the ability to project aviation's full impacts on climate and ozone;

*Whereas* ICAO requested that the IPCC include an update of the main findings of the special report in its Fourth Assessment Report, published in 2007 and its Fifth Assessment Report to be published in 2014;

*Noting* the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C;

*Acknowledging* the principles and provisions on common but differentiated responsibilities and respective capabilities, and with developed countries taking the lead under the UNFCCC and the Kyoto Protocol;

*Also acknowledging* the principles of non-discrimination and equal and fair opportunities to develop international aviation set forth in the Chicago Convention;

*Recognizing* that this Resolution does not set a precedent for or prejudice the outcome of negotiations under the UNFCCC and its Kyoto Protocol nor represent the position of the Parties to the UNFCCC and its Kyoto Protocol;

*Noting* that, consistent with Assembly Resolution A36-22, the High-level Meeting on International Aviation and Climate Change in October 2009 (HLM-ENV/09) endorsed the Programme of Action on International Aviation and Climate Change which included global aspirational goals in the form of fuel efficiency, a basket of measures and the means to measure progress;

*Recognizing* that the aspirational goal of 2 per cent annual fuel efficiency improvement is unlikely to deliver the level of reduction necessary to stabilize and then reduce aviation's absolute emissions contribution to climate change, and that goals of more ambition will need to be considered to deliver a sustainable path for aviation;

*Noting* that, to promote sustainable growth of aviation, a comprehensive approach, consisting of work on technology and standards, and on operational and market-based measures to reduce emissions is necessary;

*Noting* that the HLM-ENV/09 declared that ICAO would establish a process to develop a framework for market based measures in international aviation, taking into account the conclusions of the HLM-ENV/9 and outcome of the UNFCCC COP 15 and bearing in mind relevant ICAO Assembly resolutions and the appendices with a view to complete this process expeditiously;

*Noting* that the Conference on Aviation and Alternative Fuels in November 2009 (CAAF/09) endorsed the use of sustainable alternative fuels for aviation, particularly the use of drop-in fuels in the short to mid-term, as an important means of reducing aviation emissions;

*Also noting* that the CAAF/09 established an ICAO Global Framework for Aviation Alternative Fuels (GFAAF);

*Recognizing* the different circumstances among States in their capacity to respond to the challenges associated with climate change and the need to provide necessary support, in particular to developing countries and States having particular needs;

*Affirming* that specific measures to assist developing States as well as to facilitate access to financial support, technology transfer and capacity building should be initiated;

*Whereas* the Kyoto Protocol provides for different flexible instruments (such as the Clean Development Mechanism — CDM) which would benefit projects involving developing States;

*Affirming* that addressing GHG emissions from international aviation requires the active engagement and cooperation of States and the industry, and noting the collective commitments announced by Airports Council International (ACI), Civil Air Navigation Services Organisation (CANSO), International Air Transport Association (IATA), and International Coordinating Council of Aerospace Industries Associations (ICCAIA) on behalf of the international air transport industry to continuously improve CO<sub>2</sub> efficiency by an average of 1.5 per cent per annum from 2009 until 2020, to achieve carbon neutral growth from 2020 and reducing its carbon emissions by 50 per cent by 2050 compared to 2005 levels;

*Recognizing* the need to monitor and report the potential impacts of climate change on international aviation operations and related infrastructure;

*Recognizing* the progress made by ICAO in its implementation of the Climate Neutral UN initiative and the significant support provided by ICAO to the initiative, in particular through the development of a common methodology for calculating GHG emissions from air travel;

**The Assembly:**

**1. Resolves** that this Resolution, together with Resolution A37-18: Consolidated statement of continuing ICAO policies and practices related to environmental protection - General provisions, noise and local air quality, supersede Resolution A36-22 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;

**2. Requests** the Council to:

- a)** ensure that ICAO exercise continuous leadership on environmental issues relating to international civil aviation, including GHG emissions;
- b)** continue to study policy options to limit or reduce the environmental impact of aircraft engine emissions and to develop concrete proposals and provide advice as soon as possible to the Conference of the Parties of the UNFCCC, encompassing technical solutions and market-based measures, and taking into account potential implications of such measures for developing as well as developed countries; and
- c)** continue to cooperate with organizations involved in policy-making in this field, notably with the Conference of the Parties to the UNFCCC;

**3. Reiterates** that:

- a)** ICAO should continue to take initiatives to promote information on scientific understanding of aviation's impact and action undertaken to address aviation emissions and continue to provide the forum to facilitate discussions on solutions to address aviation emissions; and
- b)** emphasis should be on those policy options that will reduce aircraft engine emissions without negatively impacting the growth of air transport especially in developing economies;

**4. Resolves** that States and relevant organizations will work through ICAO to achieve a global annual average fuel efficiency improvement of 2 per cent until 2020 and an aspirational global fuel efficiency improvement rate of 2 per cent per annum from 2021 to 2050, calculated on the basis of volume of fuel used per revenue tonne kilometre performed;

**5. Agrees** that the goals mentioned in paragraph 4 above would not attribute specific obligations to individual States, and 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 voluntarily contribute to achieving the global aspirational goals;

**6. Also resolves** that, without any attribution of specific obligations to individual States, 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, taking into account:

- a)** the special circumstances and respective capabilities of developing countries;
- b)** that the different circumstances, respective capabilities and contribution of States to the concentration of aviation GHG emissions in the atmosphere will determine how each State may contribute to achieving the global aspirational goals;
- c)** that some States may take more ambitious actions prior to 2020, which may offset an increase in emissions from the growth of air transport in developing States;
- d)** the maturity of aviation markets;
- e)** the sustainable growth of the international aviation industry; and
- f)** that emissions may increase due to the expected growth in international air traffic until lower emitting technologies and fuels and other mitigating measures are developed and deployed;

**7. Agrees** to review, at its 38<sup>th</sup> Session, the goal mentioned in paragraph 6 above in light of progress towards the goal, new studies regarding the feasibility of achieving the goal, and relevant information from States;

**8.** *Requests* the Council to explore the feasibility of a long term global aspirational goal for international aviation, through conducting detailed studies assessing the attainability and impacts of any goals proposed, including the impact on growth as well as costs in all countries, especially developing countries, for the progress of the work to be presented to the 38<sup>th</sup> Session of the ICAO Assembly. Assessment of long term goals should include information from member States on their experiences working towards the medium term goal.

**9.** *Encourages* States to submit their action plans outlining their respective policies and actions, and annual reporting on international aviation CO<sub>2</sub> emissions to ICAO;

**10.** *Invites* those States that choose to prepare their action plans to submit them to ICAO as soon as possible preferably by the end of June 2012 in order that ICAO can compile the information in relation to achieving the global aspirational goals, and the action plans should include information on the basket of measures considered by States, reflecting their respective national capacities and circumstances, and information on any specific assistance needs;

**11.** *Requests* the Council to facilitate the dissemination of economic and technical studies and best practices related to aspirational goals and to provide guidance and other technical assistance for the preparation of States' action plans prior to the end of June 2012, in order for States to conduct their necessary studies and to voluntarily submit their action plans to ICAO;

**12.** *Resolves* that a de minimis threshold of international aviation activity of 1 per cent of total revenue ton kilometres should apply to the submission of States' action plans as follows:

**a)** States below the threshold are not expected to submit action plans towards achieving the global goals; and

**b)** States below the threshold but that otherwise have agreed to voluntarily contribute to achieving the global goals are expected to submit action plans;

**13.** *Requests* the Council, with the support of member States, to undertake work to develop a framework for market-based measures (MBMs) in international aviation, including further elaboration of the guiding principles listed in the Annex, for consideration by the 38<sup>th</sup> Session of the ICAO Assembly;

**14.** *Urges* States to respect the guiding principles listed in the Annex, when designing new and implementing existing MBMs for international aviation, and to engage in constructive bilateral and/or multilateral consultations and negotiations with other States to reach an agreement;

**15.** *Resolves* on a *de minimis* threshold of international aviation activity, consistent with the guiding principles in the Annex, of 1 per cent of total revenue ton kilometres to MBMs as follows:

**a)** commercial aircraft operators of States below the threshold should qualify for exemption for application of MBMs that are established on national, regional and global levels; and

**b)** States and regions implementing MBMs may wish to also consider an exemption for other small aircraft operators;

**16.** *Requests* the Council to review the *de minimis* threshold to MBMs in paragraph 15, taking into account specific circumstances of States and potential impacts on the aviation industry and markets, and with regard to the guiding principles listed in the Annex, by the end of 2011;

**17.** *Urges* States to review existing and planned MBMs for international aviation to ensure their consistency with the guiding principles listed in the Annex and the provisions in paragraphs 15 and 16 above;

**18.** *Requests* the Council, with the support of member States and international organizations, to continue to explore the feasibility of a global MBM scheme by undertaking further studies on the technical aspects, environmental benefits, economic impacts and the modalities of such a scheme, taking into account the outcome of the negotiations under the UNFCCC and other international developments, as appropriate, and report the progress for consideration by the 38<sup>th</sup> Session of the ICAO Assembly;

**19.** *Recognizes* that in the short term voluntary carbon offsetting schemes constitute a practical way to offset CO<sub>2</sub> emissions, and invites States to encourage their operators wishing to take early actions to use carbon offsetting, particularly through the use of credits generated from internationally recognized schemes such as the CDM;

**20.** *Requests* the Council to collect information on the volume of carbon offsets purchased in relation to air transport, and to continue to develop and disseminate best practices and tools, such as the ICAO Carbon Emissions Calculator, that will help harmonize the implementation of carbon offset programmes;

**21.** *Requests* the Council to regularly report CO<sub>2</sub> emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementation actions in the sector based on information approved by its member States;

**22.** *Requests* the Council to:

**a)** study, identify and develop processes and mechanisms to facilitate the provision of technical and financial assistance, as well as facilitate access to existing and new financial resources, technology transfer and capacity building, to developing countries and report on its progress, including processes and mechanisms developed, results achieved as well as further recommendations, preliminarily by the end of 2012 and at the 38<sup>th</sup> Session of the Assembly; and

**b)** initiate specific measures to assist developing States as well as to facilitate access to financial resources, technology transfer and capacity building;

**23. Requests States to:**

**a)** promote scientific research aimed at continuing to address the uncertainties identified in the IPCC special report on Aviation and the Global Atmosphere and in the Fourth Assessment report;

**b)** ensure that future international assessments of climate change undertaken by IPCC and other relevant United Nations bodies include updated information, if any, on aircraft-induced effects on the atmosphere;

**c)** accelerate investments on research and development to bring to market even more efficient technology by 2020;

**d)** accelerate the development and implementation of fuel efficient routings and procedures to reduce aviation emissions;

**e)** accelerate efforts to achieve environmental benefits through the application of satellite-based technologies that improve the efficiency of air navigation and work with ICAO to bring these benefits to all regions and States;

**f)** reduce legal, security, economic and other institutional barriers to enable implementation of the new ATM operating concepts for the environmentally efficient use of airspace;

**g)** develop policy actions to accelerate the appropriate development, deployment and use of sustainable alternative fuels for aviation;

**h)** work together through ICAO and other relevant international bodies, to exchange information and best practices; and

**i)** consider measures to support sustainable aviation alternative fuels research and development, investments in new feedstock cultivations and production facilities, as well as incentives to stimulate commercialisation and use of sustainable alternative fuels for aviation to accelerate the reduction of aviation CO<sub>2</sub> emissions;

**24. Requests the Council to:**

**a)** continue to develop and keep up-to-date the guidance for member States on the application of policies and measures aimed at reducing or limiting the environmental impact of emissions from aviation, and conduct further studies with respect to mitigating the impact of aviation on climate change;

**b)** encourage States to cooperate in the development of predictive analytical models for the assessment of aviation impacts;

**c)** continue evaluating the costs and benefits of the various measures, including existing measures, with the goal of addressing aircraft engine emissions in the most cost-effective manner, taking into account the interests of all parties concerned, including potential impacts on developing world;

**d)** provide the necessary guidance and direction to ICAO's Regional Offices to assist member States with studies, evaluations and development of procedures, in collaboration with other States in the region, to limit or reduce GHG emissions on a global basis and work together collaboratively to optimize the environmental benefits that can be achieved through their various programmes;

**e)** develop a global CO<sub>2</sub> Standard for aircraft aiming for 2013;

**f)** further elaborate on relevant fuel efficiency metrics, including for international business aviation, and develop medium and long term technological and operational goals for aircraft fuel burn;

**g)** encourage member States and invite industry to actively participate in further work on sustainable alternative fuels for aviation;

**h)** work with financial institutions to facilitate access to financing infrastructure development projects dedicated to sustainable aviation alternative fuels and incentives to overcome initial market hurdles;

**i)** continue to develop the necessary tools to assess the benefits associated with ATM improvements, and intensify its efforts on the development of new guidance on operational measures to reduce international aviation emissions;

**j)** implement an emphasis on increasing fuel efficiency in all aspects of the ICAO's Global Air Navigation Plan, and encourage States and stakeholders to develop air traffic management that optimize environmental benefits and to promote and share best practices applied at airports in reducing the adverse effects of GHG emissions of civil aviation;

**k)** identify appropriate standard methodologies and a mechanism to measure/estimate, monitor and verify global GHG emissions from international aviation, and States support the work of ICAO on measuring progress through the reporting of annual data on traffic and fuel consumption;

**l)** request States to continue to support the efforts of ICAO on enhancing the reliability of measuring/estimating global GHG emissions from international aviation;

**m)** undertake a study on the possible application of CDM of the Kyoto Protocol to international aviation;

**n)** monitor and disseminate relevant information on the potential impacts of climate change on international aviation operations and related infrastructure, in cooperation with other relevant international organizations and the industry; and

**o)** continue to cooperate with the Climate Neutral UN initiative, remain at the forefront of developing methods and tools for quantifying aviation's GHG emissions with respect to the initiative, and further develop and implement the strategy for reducing GHG emissions and enhancing in-house sustainability management practices of the Organization.

## Annex

### The guiding principles for the design and implementation of market-based measures (MBMs) for international aviation:

- a) MBMs should support sustainable development of the international aviation sector;
- b) MBMs should support the mitigation of GHG emissions from international aviation;
- c) MBMs should contribute towards achieving global aspirational goals;
- d) MBMs should be transparent and administratively simple;
- e) MBMs should be cost-effective;
- f) MBMs should not be duplicative and international aviation CO<sub>2</sub> emissions should be accounted for only once;
- g) MBMs should minimize carbon leakage and market distortions;
- h) MBMs should ensure the fair treatment of the international aviation sector in relation to other sectors;
- i) MBMs should recognize past and future achievements and investments in aviation fuel efficiency and in other measures to reduce aviation emissions;
- j) MBMs should not impose inappropriate economic burden on international aviation;
- k) MBMs should facilitate appropriate access to all carbon markets;
- l) MBMs should be assessed in relation to various measures on the basis of performance measured in terms of CO<sub>2</sub> emissions reductions or avoidance, where appropriate;
- m) MBMs should include *de minimis* provisions;
- n) where revenues are generated from MBMs, it is strongly recommended that they should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions, including mitigation and adaptation, as well as assistance to and support for developing States; and
- o) where emissions reductions are achieved through MBMs, they should be identified in States' emissions reporting.

# Committee on Aviation Environmental Protection (CAEP)

By **Jane Hupe**, CAEP Secretary



**Jane Hupe** is the Chief of the Environment Branch, in ICAO's Air Transport Bureau. She provides advice to the Organization on aviation related environmental matters; cooperates with UN bodies and International Organizations; manages the Environment Branch and coordinates the activities of the ICAO Council's Committee on Aviation Environmental Protection (CAEP), serving as its Secretary. Jane has also worked with ICAO as a consultant to ICAO's Technical Co-operation Bureau, providing direct assistance to ICAO's Contracting States in the environmental field. For 15 years she served as an adviser on environmental protection related subjects for the Institute of Civil Aviation (IAC) in Brazil, developing policies and regulations and representing the Ministry of Aeronautics at government related environmental forums.

## Introduction

The Committee on Aviation Environmental Protection (CAEP) is a technical committee of the ICAO Council, responsible for conducting studies and recommending measures to minimize and reduce aviation's impact on the environment, including setting certification Standards for aircraft noise and aircraft engine emissions.

ICAO has three environmental goals for international aviation which aim to: 1) reduce the number of people exposed to significant aircraft noise; 2) reduce the impact of aviation emissions on local air quality; and 3) reduce the impact of aviation emissions on the global climate. In support of these goals and in its role as international aviation's leading environmental body, CAEP has adopted a structured approach to developing and delivering solutions to the air transport sector—initially by quantifying related environmental impacts and then by establishing practical mitigation measures to address them. More than 400 world renowned experts whose expertise spans environmental and technical issues related to aviation are involved in the work of CAEP.

CAEP recommendations, and in particular, its standard setting activities are considered and developed in light of four main criteria:

1. technical feasibility;
2. economic reasonableness;
3. environmental benefit; and
4. consideration of the potential interdependence (trade-offs) with other mitigation measures.

## **Certification Standards and Annex 16**

Aircraft are required to meet the environmental certification Standards adopted by the Council of ICAO. These are contained in Annex 16 (Environmental Protection) to the Convention on International Civil Aviation. Annex 16 consists of two volumes: Volume I - Aircraft Noise and Volume II - Aircraft Engine Emissions. These certification Standards have been designed and are kept up to date in order to respond to concerns regarding the environmental impact of aviation on communities in the vicinity of airports, as well as society at large.

## CAEP Membership

Currently, CAEP consists of 24 Members from all ICAO Regions and 13 Observers from States, intergovernmental and non-governmental organizations, including airlines, aircraft and engine manufacturers, airports, pilot associations, environmental NGOs and UN bodies. For the CAEP/9 cycle (2010 to 2013), experts, nominated by their respective CAEP members and observers, will participate in the various CAEP expert groups as shown in **Figure 1**.

### **CAEP Members**

*Argentina, Australia, Brazil, Canada, China, Egypt, France, Germany, India, Italy, Japan, Netherlands, Nigeria, Poland, Russian Federation, Singapore, South Africa, Spain, Sweden, Switzerland, Tunisia, Ukraine, United Kingdom and the United States.*

### **CAEP Observers**

*Greece, Norway, Arab Civil Aviation Commission – ACAC, Airports Council International – ACI, Civil Air Navigation Services Organisation – CANSO, European Commission – EC, International Air Transport Association – IATA, International Business Aviation Council – IBAC, International Co-ordinating Council of Aerospace Industries Associations – ICCAIA, International Coalition for Sustainable Aviation – ICSA, International Federation of Air Line Pilots’ Associations – IFALPA, United Nations Framework Convention on Climate Change – UNFCCC, World Meteorological Organization – WMO and ICAO Secretariat.*

### **CAEP Structure**

CAEP is the only technical committee of the ICAO Council. CAEP currently has three specialized Working Groups and four Support Groups, as well as Independent Experts and Task Groups. The structure of CAEP leading to CAEP/9 is illustrated in Figure 1.

### **CAEP Working Methods**

CAEP usually meets once every three years, coinciding with the year the ICAO Assembly is held. At each CAEP meeting, the Committee’s structure and the work programme of each of its expert groups is reviewed and updated. In addition, a Steering Group meets once a year to review and provide guidance on the progress of the activities of the expert groups.

Annex 16, Volume I Amendment 10.
Annex 16, Volume II Amendment 7.
CAEP Independent experts process for noise - Report.
CAEP Independent experts process for fuel burn - Report.
CAEP Independent experts process for NO <sub>x</sub> - Report.
CAEP Independent experts process for operational goals - Report.
New ICAO guidance on CDA.
Revised Doc 9829 - Guidance on the Balanced Approach to Aircraft Noise Management – Amendment 2.
Revised Doc 9501 - ETM - Environmental Technical Manual, vols I and II.
Doc 9888 - Amendment to the Review of Noise Abatement Procedure Research and Development and Implementation Results.
New Environment Technical Manual – Part I and Part II – including the Guidelines on the use of Procedures in the Emissions Certification of Aircraft Engines.
Revised Doc 9750 - Global Air Navigation Plan for CNS/ATM Systems, Appendix H.
Updated Doc 9885 - Draft Guidance on the use of Emissions Trading for Aviation.
Updated Report on Voluntary Emissions Trading for Aviation.
Scoping study of issues related to linking open emission trading systems involving international aviation and the potential for the use of emissions trading for local air quality - Report.
Report on the potential of emissions to offset measures to further mitigate the effects of aviation emissions on local air quality and global climate change.
Report on offsetting emissions from the Aviation sector.
New guidance material to replace Circular 303 - Updated Operational Opportunities to Minimize Fuel Use and Reduce Emissions.
New report on the use of Environmental Managements Systems in the aviation sector.
New ICAO guidance on computing, assessing and reporting on aviation emissions at national and global level.
Doc 9889 - Update to Airport Air Quality Guidance Manual.

**Table 1:** List of the publications recommended by CAEP/8

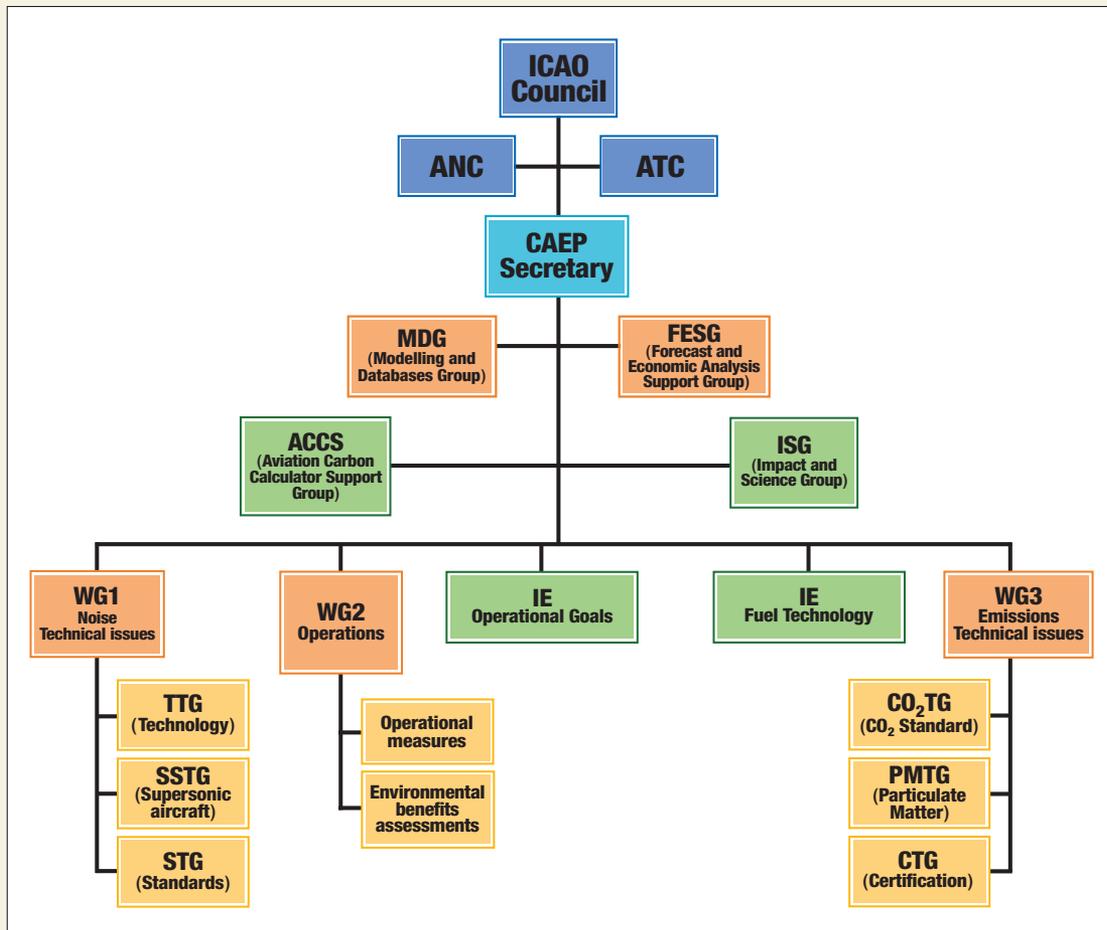


Figure 1: CAEP working groups structure leading to CAEP/9 (2013).

## CAEP Working Groups

### ■ Working Group 1 (WG1) – Aircraft Noise Technical Issues

The main aim of WG1 is to keep international aircraft noise certification Standards (Annex 16, Volume I) up-to-date and effective, while ensuring that the certification procedures are as simple and inexpensive as possible.

### ■ Working Group 2 (WG2) – Operations

WG2 addresses aircraft noise and emissions issues linked to airports and operations.

### ■ Working Group 3 (WG3) – Emissions Technical Issues

WG3 deals with aircraft performance and emission technical matters, including the updating of Annex 16 - Volume II and the development of an aircraft CO<sub>2</sub> Standard.

### ■ Modelling and Databases Group (MDG)

MDG was created at CAEP/8 and replaces the Modelling and Databases Task Force (MODTF), that was established during the CAEP/7 meeting. This new group carries out modelling efforts in support to the activities of the other CAEP groups and maintains various databases such as the movements, fleet, and population databases.

### ■ Forecasting and Economic Analysis Support Group (FESG)

The main role of the FESG is to develop and maintain the databases necessary to provide the framework for performing economic analysis and forecasting fleet growth. It provides support to the other working groups within CAEP and works with them on data issues that concern more than one working group.

### ■ Aviation Carbon Calculator Support Group (ACCS)

This group was formed in 2007. It successfully developed an impartial, transparent methodology for computing the CO<sub>2</sub> emissions from passenger air travel which is continuously updated.

### ■ Impacts and Science Group (ISG)

This group was established at CAEP/6 but the final Terms of Reference for the Impacts and Science Group will be further detailed in the early 2011.

### ■ Independent Experts Groups (IE)

### ■ Task Groups (TG)

### ■ Air Navigation Commission (ANC)

### ■ Air Transport Committee (ATC)



*CAEP Members and Observers - CAEP/8 meeting, Montreal, February 2010.*

The ICAO Council normally refers triennial CAEP reports to two main ICAO bodies, the Air Navigation Commission (ANC) and the Air Transport Committee (ATC), for the review of technical and economic aspects of CAEP recommendations, respectively. The Council then reviews and approves the CAEP recommendations, including Annex 16 Standards and Recommended Practices. In turn, the Council reports to the ICAO Assembly, where the main ICAO policies related to aviation environmental protection are defined and issued.

The eighth meeting of CAEP (CAEP/8), held in February 2010, featured a challenging agenda covering an update of NO<sub>x</sub> Standards, a review of progress on CO<sub>2</sub> and particulate matter (PM) Standards, and an agreement on priorities over the next work cycle. CAEP/8 agreed on a comprehensive set of 19 recommendations which will help ICAO fulfil its mandate on the environment (see ICAO Doc 9938, *Report of the Eighth Meeting of the Committee on Aviation Environmental Protection*).

The work also results in the publication of ICAO environmental documents, including reports, guidance material, and/or specific studies. These publications help to ensure that the most up-to-date information on aviation environmental issues is fully available to State authorities and the broader aviation community for future planning and related decisions and actions (see **Table 1**).

### **CAEP/8 Outcomes**

This report contains various articles related to the work of CAEP, including the assessment of trends for aircraft noise and emissions and the development of measures to address these effects. The excellent results of CAEP/8 represent another solid step towards the achievement of ICAO's environmental goals. Through the CAEP process and related activities, the Organization will continue to move environmental issues forward as a high priority, delivering concrete and actionable results that will help lead international aviation stakeholders toward a more sustainable future. ■