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UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Subsidiary Body for Scientific and Technological Advice

Thirty-sixth session

Bonn, 14–25 May 2012

Item 10(d) of the provisional agenda

Methodological issues under the Convention

Emissions from fuel used for international aviation and maritime transport

Information relevant to emissions from fuel used for international aviation and maritime transport

Submissions from international organizations

1. The Subsidiary Body for Scientific and Technological Advice, at its thirty-fifth session, invited the secretariats of the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to continue to report, at its future sessions, on relevant work in relation to addressing emissions from fuel used for international aviation and maritime transport.¹

2. The secretariat has received submissions from ICAO and IMO containing information on emissions from fuel used for international aviation and maritime transport. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the language in which they were received and without formal editing.

¹ FCCC/SBSTA/2011/5, paragraph 62.

* These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

FCCC/SBSTA/2012/MISC.7

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**UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE
(UNFCCC)**

**The Thirty-sixth Session of the UNFCCC Subsidiary Body for
Scientific and Technological Advice (SBSTA36)
(14 to 25 May 2012 – Bonn, Germany)**

**Agenda Item 10 (d)
Emissions from fuel used for international aviation and maritime transport**

TOWARDS THE SUSTAINABLE DEVELOPMENT OF INTERNATIONAL AVIATION

(Submission by the International Civil Aviation Organization (ICAO))

This submission describes the main progress made on actions requested by the 37th Session of the ICAO Assembly in the field of international aviation and climate change, in four key areas: 1) States' action plans and assistance to States, 2) sustainable alternative fuels for aviation, 3) market-based measures, and 4) global aspirational goals. ICAO's positions and perspectives on the work related to long-term climate finance are also presented.

**1. ASSEMBLY RESOLUTION ON INTERNATIONAL
AVIATION AND CLIMATE CHANGE (A37-19)**

1.1 The Resolution A37-19, adopted by the 37th Session of the ICAO Assembly in October 2010, provides a solid policy framework relating to climate change towards the sustainable development of international aviation. The full text of the Resolution is included in the Appendix.

1.2 The Resolution makes international aviation the first sector with global aspirational goals of improving annual fuel efficiency by 2 per cent and stabilizing its global CO₂ emissions at 2020 levels. The Assembly also agreed on the guiding principles for market-based measures and decided to explore a global scheme for international aviation. A global CO₂ certification Standard for aircraft is expected to be developed by 2013. It was further agreed that the Organization would continue to be at the forefront of international efforts to facilitate the development and deployment of sustainable alternative fuels for aviation.

1.3 The agreement on the voluntary submission of member States' action plans to ICAO has led to a dynamic shift in the Organization's policy outlook on the environment from a "Standards and policies setting" phase to a more action-oriented "implementation" mode. The action plans allow States to identify their basket of mitigation measures and assistance needs to implement such measures. In turn, the compilation of information contained in the States' action plans will enable ICAO to assess the progress toward achieving the global aspirational goals, as well as identify the areas of implementation support and assistance needed towards the provision of such assistance to States.

2. RECENT PROGRESS AND NEXT STEPS

2.1 Since the 37th Session of the Assembly, ICAO has made important progress on actions requested by the Assembly, focusing on four key areas: 1) States' action plans and assistance to States, 2) sustainable alternative fuels for aviation, 3) market-based measures, and 4) global aspirational goals, in order to move international aviation closer to a sustainable future.

States' Action Plans and Assistance to States

2.2 To assist States in the preparation of their action plans on CO₂ emissions reduction activities for international aviation, ICAO developed a guidance document and an interactive web-interface, as well as conducted six hands-on training workshops in 2011, during which 81 States representing 92.4 per cent of global international air traffic were trained, and a number of States have already submitted their action plans to ICAO. ICAO has continued to provide support to States, including making individual contact with States by the ICAO Secretariat, in cooperation with the ICAO Technical Cooperation Bureau, with a view to providing States with the specific tools and information to assist them to develop and submit their action plans by June 2012, as encouraged by the 37th Session of the ICAO Assembly.

2.3 Those States' action plans submitted to ICAO will be compiled and the areas of implementation support and assistance needs will be identified. ICAO is planning a seminar in October 2012 to share information with States and other stakeholders on the assistance needed to implement actions to address CO₂ emissions, including the identification of potential sources and consideration of possible processes and mechanisms under ICAO to facilitate the provisions of such assistance.

Sustainable Alternative Fuels for Aviation

2.4 Sustainable alternative fuels for aviation offer one of the most exciting and promising opportunities for reducing the sector's GHG emissions while improving local air quality, and ICAO has been providing a forum for the exchange of information on the state of worldwide activities in this area. Over 300 initiatives on alternative fuels production and deployment are underway, and there are five major consortia established and working on alternative fuels for aviation. On the use of such fuels, aviation is a real and concrete example of how much can be done, within a relatively short timeframe, to turn a dream into reality. Today, the use of drop-in biofuels in aviation has become a reality as they do not require changes to aircraft or fuel delivery infrastructure, and airlines have already begun using such fuels in commercial flights.

2.5 Technological aspects have proven to be viable. The next challenge is to enable the availability of such fuels in a timely and commercially viable manner and in sufficient quantities for use in aviation. The ICAO Workshop on Aviation and Sustainable Alternative Fuels held in October 2011 recognized the positive contribution of alternative aviation fuels to the three pillars of sustainability (social, economic and environmental), and reaffirmed the need to address challenges for ensuring the availability of such fuels for aviation (www.icao.int/sustaf). ICAO continues to concentrate its efforts in promoting and further facilitating the development and deployment of such fuels for aviation on a global scale, and is preparing the policy proposals in this area for consideration by the 38th Session of the ICAO Assembly in 2013.

Market-based Measures (MBMs)

2.6 It is paramount that the patchwork of uncoordinated market-based measures (MBMs) undertaken by different States and regions be avoided. In this regard, the 37th Session of the ICAO Assembly agreed on the development of a framework for MBMs, including the elaboration of the guiding principles adopted by the Assembly, and decided to explore a global MBM scheme for international aviation.

2.7 The Organization has been undertaking intensive work to develop a global solution on this subject, and the recent session of the ICAO Council in March 2012 identified four options for a global MBM scheme, and the evaluation criteria were built upon the guiding principles for the further evaluation of the options. A report on the evaluation of the options for a global MBM scheme and further work on the framework for MBMs will be presented to the next session of the ICAO Council in June 2012, for its further consideration. Work on MBMs by the ICAO Council will be presented to the 38th Session of the ICAO Assembly in 2013.

Global Aspirational Goals

2.8 ICAO has been working on the development of a robust aviation environmental analysis system that will enable the measurement of progress towards the global aspirational goals and will allow for ICAO to report international aviation CO₂ emissions to the UNFCCC, as requested by the 37th Session of the ICAO Assembly. The data compiled from States' action plans, as well as the results of environmental trends assessment and 2°C study being undertaken by the ICAO's Committee on Aviation Environmental Protection (CAEP), are expected to be ready for consideration by the Council in 2013 with respect to the review of the medium-term global aspirational goal and exploring a long-term global aspirational goal for international aviation.

CO₂ Certification Standard for Aircraft

2.9 Another major area of activity in the field of international aviation and climate change is the development of a technical CO₂ certification Standard for aircraft, which is one of the most challenging tasks in the CAEP work programme. Significant efforts have been directed towards the identification and selection of a CO₂ metric system, as part of the certification requirement, which is expected to be completed by the next annual CAEP Steering Group meeting in July 2011, followed by the development of the Standard aimed for completion in 2013.

3. LONG-TERM CLIMATE CHANGE FINANCE

3.1 The Durban Conference recalled that developed country Parties to the UNFCCC committed to a goal of mobilizing USD 100 billion per year by 2020 to address the needs of developing countries. While the Durban Conference did not agree on the specific sources of such revenue, it decided to analyze options from a wide variety of sources, drawing upon relevant reports, including the report of the High-level Advisory Group on Climate Financing (AGF) and that of the World Bank (WB)/International Monetary Fund (IMF) under the G20 process.

3.2 The WB/IMF report explored global carbon charges of \$25 per tonne of CO₂ on international transport, which it suggests could raise USD 12 billion per year by 2020 from international aviation. The G20 Summit in Cannes, France in November 2011 discussed the report and requested Finance Ministers to continue work in this field.

3.3 It should be highlighted that the global aspirational goals for the international aviation sector, adopted by the 37th Session of the ICAO Assembly, will require adequate financial resources within the sector itself, enabling it to effectively respond to the global climate change challenge. The Assembly agreed on the guiding principles for the design and implementation of market-based measures, and decided to explore a global scheme for international aviation.

3.4 It is of utmost importance that the design and implementation of market-based measures for international aviation be treated as one element of ICAO's comprehensive mitigation strategy to achieve the global aspirational goals, as part of a global solution for the sustainable future of international aviation, and not in isolation.

3.5 In addition, discussions on climate change need to strike a good balance among the three pillars of social, economic and environmental sustainability which, once applied to the international aviation sector, will allow this sector to grow in an environmentally sustainable manner and at the same time, will continue to ensure the connectivity and access to mobility and to facilitate the exchange of cultural and educational experiences.

4. CONCLUSIONS

4.1 ICAO has been working actively towards developing global solutions to address greenhouse gas emissions from international aviation. ICAO Assembly Resolution A37-19 is a clear demonstration of the willingness of ICAO and its member States to take concrete steps relating to climate change towards the sustainable development of international aviation.

4.2 ICAO expects the UNFCCC process to deliver an agreement that acknowledges ICAO's achievements as the specialized agency for international aviation in the area of climate change, and encourages its member States to work further through ICAO.

APPENDIX

ICAO Assembly 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 CO₂ 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 prejudge 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 CO₂ 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 38th 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 38th 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 CO₂ 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 38th 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 38th Session of the ICAO Assembly;

19. *Recognizes* that in the short term voluntary carbon offsetting schemes constitute a practical way to offset CO₂ 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 CO₂ 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 38th 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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.

**Submission by the International Maritime Organization
to the thirty-sixth session of UNFCCC's Subsidiary Body for
Scientific and Technological Advice (SBSTA 36)**

**Agenda item 10(d)
Emissions from fuel used for international aviation and maritime transport**

**Outcome of the sixty-third session of IMO's Marine Environment Protection Committee -
further progress made on technical, operational and market-based measures to increase
energy efficiency in international shipping**

4 April 2012

SUMMARY

IMO's Marine Environment Protection Committee met for its sixty-third session (MEPC 63) in February/March 2012 with control of greenhouse gas emissions from ships engaged in international trade as the paramount issue on its agenda. More than 800 delegates from 99 Member States, five United Nations bodies, six intergovernmental organizations and 46 non-governmental organizations with consultative status with IMO participated at the session.

The Committee adopted important series of guidelines to support uniform implementation of the mandatory measures to increase energy efficiency and reduce emissions of greenhouse gases (GHGs) from international shipping, paving the way for the regulations on EEDI and SEEMP to be smoothly and uniformly implemented by Administrations and industry upon entry into force on 1 January 2013.

The MEPC also continued its intensive discussion on market-based measures for greenhouse gas emissions from international shipping.

IMO is now focusing its efforts on technical cooperation and capacity building to ensure smooth and effective implementation and enforcement of the new regulations worldwide and will be holding a series of workshops in all regions of the world on implementation of the measures to address GHG.

Introduction

1 IMO's Marine Environment Protection Committee met for its sixty-third session (MEPC 63) in London from 27 February to 2 March 2012 where, yet again, control of greenhouse gas (GHG) emissions and improvement in energy efficiency for ships engaged in international trade was the dominant issue on its agenda.

2 Due to its close connection to global commerce, international shipping plays a vital role in the facilitation of world trade as the most cost-effective and energy-efficient mode of mass transport, making a significant contribution to global prosperity in both developing and developed countries.

3 As shipping is a global industry with most ships registered in developing countries and shipowners having the freedom to choose where to register their ships, it must be regulated at the global level for any control regime to be effective and to maintain a level playing field for all ships irrespective of flag (nationality) or ownership. In other words, the global character of shipping requires global regulation that applies universally to all ships in line with the basic principle of non-discrimination set out in IMO's constitutive Convention.

4 IMO was established by governments as a specialized agency under the United Nations to provide machinery for intergovernmental cooperation in the field of regulation of ships engaged in international trade. IMO is responsible for the global regulation of all facets pertaining to international shipping and has a key role in ensuring that lives at sea are not put at risk and that the environment is not polluted by ships' operations – as summed up in IMO's mission statement: **Safe, Secure and Efficient Shipping on Clean Oceans.**

Work on control of greenhouse gas emissions from international shipping

5 Mandatory measures to improve energy efficiency and to reduce GHG emissions from international shipping were adopted by Parties to MARPOL Annex VI at MEPC 62 in July 2011, representing the first ever mandatory global energy efficiency standard for an international industry sector, and the first legally binding climate change treaty to be adopted since the Kyoto Protocol. The measures are expected to enter into force on 1 January 2013. For comprehensive information on the breakthrough adoption of mandatory technical and operational measures, please refer to IMO's submission to SBSTA 35 (FCCC/SBSTA/2011/MISC.9, as well as IMO's website: www.imo.org.

6 As a follow up to the breakthrough at IMO in July 2011, MEPC 63 in March 2012 adopted four sets of important guidelines intended to assist in the implementation of the mandatory regulations on Energy Efficiency for Ships in MARPOL Annex VI:

- *2012 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships;*
- *2012 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP);*
- *2012 Guidelines on survey and certification of the Energy Efficiency Design Index (EEDI); and*
- *Guidelines for calculation of reference lines for use with the Energy Efficiency Design Index (EEDI).*

7 Finalization and adoption of the supporting guidelines was a significant achievement which provides sufficient lead time for Administrations and industry to prepare. The guidelines will support Member States in their uniform implementation of the amendments to MARPOL Annex VI *Regulations for the prevention of air pollution from ships*, adopted in July 2011, which add a new chapter 4 to Annex VI on regulations on energy efficiency for ships to make mandatory the Energy Efficiency Design Index (EEDI) for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships.

8 The EEDI is a non-prescriptive, performance-based mechanism that leaves the choice of technologies to use in a specific ship design to the industry. As long as the required energy-efficiency level is attained, ship designers and builders would be free to use the most cost-efficient solutions for the ship to comply with the regulations.

9 All ships above 400 gross tonnes engaged in international trade will, from the entry into force of the new regulations, have to implement and maintain a ship specific Energy Efficiency Management Plan - the SEEMP which establishes a mechanism for operators to improve the energy efficiency of ships. Each ship will have to monitor the energy efficiency performance of its transportation work and at regular intervals consider new technologies and practices to improve its energy efficiency.

10 The MEPC 63 also agreed an updated work plan for the development of further guidelines and the development of energy efficiency frameworks for those ships not covered by the current EEDI regulations.

Technology transfer resolution debated

11 Linked to the implementation of energy efficiency measures was the draft MEPC resolution on the *Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships*, where it was agreed to further discuss the draft at the next session.

MBMs discussion continues

12 The MEPC 63 continued its consideration of proposed market-based measures (MBMs), which would complement the technical and operational measures already adopted. Further debate will continue at the next session (MEPC 64, 1 to 5 October 2012). The MBM proposals under review range from a contribution or levy on all CO₂ emissions from international shipping or only from those ships not meeting the EEDI requirement, via emission trading systems, to schemes based on a ship's actual efficiency, both by design (EEDI) and operation (SEEMP).

13 The Committee considered the undertaking of an impact assessment of the MBM proposals with focus on possible impacts on consumers and industries in developing countries, in particular, least developed countries, small islands developing States and remotely located developing countries with long trading distances, and considered in detail the methodology and criteria it should be based on. Towards the end of the meeting, the Chairman presented consolidated draft terms of reference for the impact assessment which will continue to be considered at the next session in October 2012.

Technical assistance related to improvement of energy efficiency in shipping

14 The Vice-Chairman of MEPC undertook in 2009, in accordance with relevant IMO provisions, a preliminary assessment of the capacity building needs related to the then proposed new chapter 4 of MARPOL Annex VI, which made the following observations and recommendations:

- .1 it will be necessary to update national legislation and developing countries may need technical assistance to do this;
- .2 there will be a need to train seafarers in use of new technologies;

- .3 there will be a need to train flag and port State control officers to ensure effective and uniform implementation and enforcement; and
- .4 that it is necessary to instil in the industry an energy efficiency culture both onboard ships and in the land-based organizations.

15 It was suggested in the preliminary assessment that IMO's Integrated Technical Cooperation Programme (ITCP) should allocate funding for the recommended training and that such activities should be implemented before the entry into force of the amendments. This recommendation has been thoroughly followed up by IMO which has developed training courses and material in response to the identified needs as set out below:

- .1 **Awareness raising of energy efficiency and CO₂ emissions from international shipping:** Regional and national workshops to raise awareness of GHG emissions from ships and their link to climate change, and in particular on the mandatory technical and operational measures in Chapter 4 of MARPOL Annex VI.
- .2 **Energy Efficient Ship Design:** Regional and national workshops to enable participants to identify the elements influencing the energy efficiency of a given ship design and to use relevant tools for calculation of a ship's EEDI value.
- .3 **Energy Efficient Ship Operations:** Regional and national workshops Aimed at training personnel on full and effective implementation and optimization of operational energy efficiency measures on board ships.
- .4 **Port State Control related to energy efficiency and GHG emissions under MARPOL Annex VI:** Regional workshops for PSC officers to raise awareness of the MARPOL Annex VI requirements on energy efficiency and to enhance their global and uniform implementation and enforcement.

16 A comprehensive portfolio of training material has been produced under each of the abovementioned activities and train-the-trainer courses are and will be held. In addition to funding through IMO's technical cooperation programme (ITCP), IMO in April 2011, signed an agreement with the Korean International Cooperation Agency for implementation of a project on "Building Capacities in East Asian countries to address GHG emissions from Ships". A total of 12 workshops or training courses are planned for 2012 and IMO is seeking additional funding from various sources to scale up the activities.

Conclusions

17 Although international maritime transport is the most energy efficient mode of mass transport and only a modest contributor to worldwide CO₂ emissions (2.7% in 2007), a global approach for further improvements in energy efficiency and emission reduction is needed as sea transport is predicted to continue growing significantly in pace with world trade.

18 IMO has developed and adopted a set of robust and efficient technical and operational measures that will serve as mandatory performance standards for increased energy efficiency in international shipping in a comprehensive regulatory framework based on the Organization's extensive experience and well established policies and practices. The framework builds on IMO's reputable and well tested enforcement and control provisions (flag and port State controls) and

includes also aspects such as monitoring, verification and reporting as well as modalities for effective implementation. The Organization's work on these matters represent a practical approach that may very well serve as an example of how to establish global performance standards on energy efficiency.

19 With regard to the market-based measures, IMO and its Member Governments, recognising that the technical and operational measures alone would not be sufficient to satisfactorily reduce the amount of GHG emissions from international shipping in view of projections for world trade and the overall reductions needed to meet the two degrees target, are engaged in discussions to establish a possible mechanism that will enable the shipping industry to achieve the eventually agreed reduction target.

20 IMO, as the global regulator of international shipping, will continue its endeavours to reduce any environmental impacts from international maritime transport, a transport industry that is vital to world trade and sustainable development, and keep relevant bodies of the UNFCCC informed of its achievements.
