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UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

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(6 to 15 November 2017 – Bonn, Germany)

Agenda Item 10 (b): Emissions from fuel used for international aviation and maritime transport

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

Executive Summary

The 39th Session of the ICAO Assembly in October 2016 reaffirmed the global aspirational goals for the international aviation sector, of 2 per cent annual fuel efficiency improvement and carbon neutral growth from 2020. This paper reports substantial progress made since the Assembly in all aspects of a "basket of measures", namely aircraft technology, operational improvements, sustainable aviation fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

Aircraft Technology: in March 2017, ICAO adopted the first ever global certification CO_2 Standard for aeroplanes, which will apply to new aeroplane-type designs from 2020 and to aeroplane type designs that are already in-production in 2023.

Operational Improvements / Airports: also bear a significant CO_2 emissions reduction potential, including through the ICAO's Aviation System Block Upgrades (ASBUs) strategy. ICAO Seminar on Green Airports, to be held from 29 to 30 November 2017 in Montréal, Canada will also facilitate the exchange of best practices related to the diverse range of airport activities.

Sustainable Aviation Fuels: the ICAO Conference which took place from 11 to 13 October 2017 in Mexico City, agreed on the 2050 ICAO Vision as a living inspirational path toward a significant proportion of conventional aviation fuels to be substituted with sustainable aviation fuels by 2050. The Vision will be periodically reviewed through a stocktaking process to continuously assess progress on the development and deployment of sustainable aviation fuels, leading up to the convening of the next Conference by 2025, with a view to updating the Vision to include a quantified proportion of conventional aviation fuels to be substituted with sustainable aviation fuels by 2050.

CORSIA: ICAO and its Member States have been prioritizing efforts in undertaking preparatory activities to ensure the timely implementation of CORSIA. In September 2017, the ICAO Council's Committee on Aviation Environmental Protection (CAEP) had developed draft rules and guidance, including for Monitoring, Reporting and Verification (MRV) of CO_2 emissions from international aviation, which are expected to be adopted by the ICAO Council in June 2018, for implementation by Member States from 1 January 2019. ICAO will also determine eligible emissions units which airlines will purchase in order to meet their offsetting requirements under CORSIA.

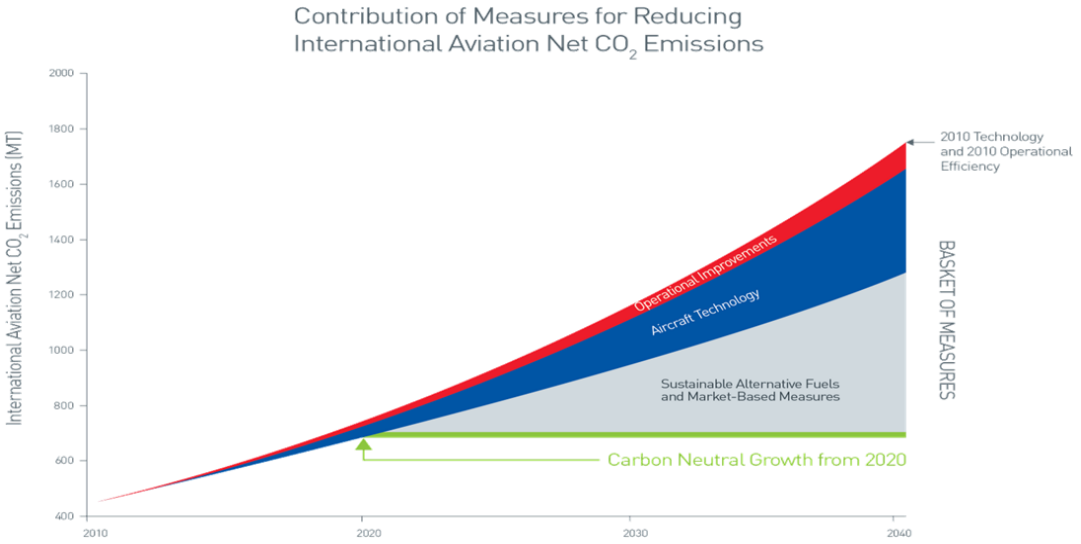
Capacity Building / Assistance: to ensure the successful implementation of CORSIA by Member States, ICAO has also been undertaking a capacity building and assistance programme, including the organization of regional seminars in all ICAO regions, and development of brochures and on-line tutorials related to CORSIA. ICAO will convene another series of regional seminars during the period of March / April 2018.

1. INTRODUCTION

1.1 The 39th Session of the ICAO Assembly in October 2016 adopted Assembly Resolution A39-2, "*Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change*", and Assembly Resolution A39-3, "*Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme*".

1.2 The Assembly recognized ICAO's substantial progress in addressing CO_2 emissions from international aviation, by developing and facilitating the implementation of "a basket of mitigation measures" in order to achieve ICAO's global aspirational goals for the international aviation sector of improving fuel efficiency by 2 per cent per year, and keeping its CO_2 emissions from 2020 at the same level (carbon neutral growth from 2020).

1.3 In order to measure current and estimate future progress toward the achievement of the ICAO aspirational goals, the ICAO Committee on Aviation Environmental Protection (CAEP) regularly updates the CO_2 trends assessment, which reflects the contribution of the basket of mitigation measures to reduce international aviation CO_2 emissions (e.g. aircraft technology, operational improvements, sustainable aviation fuels). The 39th Assembly endorsed the environmental trends as the basis for future decision-making on environmental matters, and requested that the next Assembly be provided with further updated trends.



2. PROGRESS ON A BASKET OF MITIGATION MEASURES

2.1 The 39th Assembly recognized significant progress in supporting our Member States to take further action on a basket of measures to reduce emissions from international aviation, including acceleration of the use of fuel-efficient aircraft technology, air traffic management modernization and other operational improvements, sustainable alternative fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

Aircraft Technology

2.2 For example, the ICAO Council in March 2017 adopted an aeroplane CO_2 emissions certification Standard. This new Standard, as the first global Standard for CO_2 emissions of any sector, will apply to new aeroplane-type designs from 2020 and to aeroplane-type designs that are already in-production in 2023. This means that if an in-production aeroplane design is changed at a

time beyond 2023, the aeroplane would have to comply with the CO_2 emissions Standard. In 2028, there is a production cut-off, meaning that in-production aeroplanes that do not meet the standard from 2028 can no longer be produced, unless the designs are modified to meet with the Standard. The CO_2 emissions Standard was adopted as a new Volume III of Annex 16 to the Chicago Convention.

2.3 There are several exciting developments in the field of small electrically-powered aircraft concepts, for example, the Solar Impulse, the Airbus e-fan and the NASA X-57. These aircraft aim to demonstrate that electric propulsion can make small aeroplanes more environmentally friendly. It is unlikely that an electrically-powered aeroplane will enter service for international civil aviation in the foreseeable future. It is possible that More Electric Aircraft (MEA) technology may be more prevalent in the future, which will utilize electrical power for some non-propulsive systems.

Operational Improvements / Airports

2.4 Recognizing that many of the operational improvements defined in the ICAO Global Air Navigation Plan (GANP) offer the potential to deliver fuel and CO_2 emissions reduction, an analysis of environmental benefits from the implementation of such measures has been conducted. Activities in the current triennium include the estimation of CO_2 reduction benefits from the implementation of Aviation System Block Upgrades (ASBUs) strategy – Block 1. Another important area of ongoing work is the risk assessment of potential climate change impacts to airport infrastructure and aviation operations, and identification of possible adaptation measures.

2.5 In addition, the ICAO Seminar on Green Airports [1] will be held from 29 to 30 November 2017 in Montréal, Canada to facilitate discussions and encourage the exchange of best practices related to the diverse range of airport activities, including smart buildings, renewable energy, green mobility, climate change resilience, and community engagement.

2.6 ICAO's work on climate change resilience and adaptation contributes to UN Sustainable Development Goal (SDG) 9 and includes the work programme of the CAEP to assess potential impacts of climate change on international aviation operations and related infrastructure and to identify adaptation measures to address the impacts. For example, ICAO included a new chapter on climate adaptation and resilience in the ICAO Airport planning Manual, Part 2 (Doc 9184). For the first time, climate change impacts were included in airport planning considerations, alongside with aircraft noise, which had historically been the main environmental concern around airports. ICAO also cooperates with other organizations on this matter, including with Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization (WMO) and EUROCONTROL.

Sustainable Aviation Fuels

2.7 The 39th Assembly recognized the continuing ICAO support to States and other stakeholders in their efforts to develop and deploy sustainable aviation fuels, including the facilitation of dialogues and information exchange, and regular updates to the ICAO Global Framework for Aviation Alternative Fuels (GFAAF)[2]. Industry-wide progress has been registered in the GFAAF, including the approval of five conversion processes for sustainable aviation fuel production, and a number of airports distributing such fuels, which has led to more than 40,000 commercial flights using sustainable aviation fuels since they were introduced.

2.8 The ICAO Alternative Fuel Seminar in February 2017 [3] further exchanged information on the state of worldwide activities on the development of sustainable aviation fuels, life-cycle analysis methodologies and sustainability criteria, regulatory frameworks and assistance

[1] https://www.icao.int/Meetings/greenairports/Pages/default.aspx
[2] http://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx
[3] http://www.icao.int/Meetings/altfuels17/Pages/default.aspx

programmes. The seminar's result served as a basis for the second ICAO Conference on Aviation Alternative Fuels (CAAF/2)[4], which was convened from 11 to 13 October 2017 in Mexico City.

2.9 The Conference adopted a Declaration, including the 2050 ICAO Vision for Sustainable Aviation Fuels as a living inspirational path toward a significant proportion of conventional aviation fuels to be substituted with sustainable aviation fuels by 2050. The Vision will be periodically reviewed through a stocktaking process to continuously assess progress on the development and deployment of sustainable aviation fuels, including the organization of regular workshops and seminars, leading up to the convening of CAAF/3 no later than 2025, with a view to updating the Vision to include a quantified proportion of conventional aviation fuels to be substituted with sustainable aviation fuels by 2050, and the associated carbon reductions to be achieved. **The Declaration adopted by the CAAF/2 is provided in Appendix A.**

2.10 ICAO and its Member States, in cooperation with the aviation industry and other stakeholders, will work together to pursue any opportunities to implement necessary policies, technology and financing measures, with an increasing proportion of sustainable aviation fuels into the fuel supply over time towards the 2050 ICAO Vision, according to the CAAF/2 Declaration.

2.11 The Conference also confirmed that the sustainability of aviation alternative fuels is of essential importance to the efforts of international aviation to reduce its CO_2 emissions, and this is ensured by application of sustainability criteria which is currently under consideration by ICAO.

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

2.12 CORSIA was adopted by the 39th Assembly in October 2016, reflecting the years of intensive efforts by ICAO and its Member States, in cooperation with the aviation industry and other stakeholders. CORSIA is part of a broader basket of mitigation measures to achieve the ICAO global aspirational goal of carbon neutral growth from 2020. **ICAO Assembly Resolution A39-3 related to CORSIA is provided in Appendix B.**

2.13 CORSIA has a phased implementation approach, with a pilot phase from 2021 through 2023; a first phase from 2024 through 2026; and a second phase from 2027 through 2035. For the first two phases from 2021 to 2026, participation of States for offsetting requirements is voluntary. To date, 72 States – representing about 87.7 per cent of international aviation traffic – had announced their intention to participate in the CORSIA from 2021.

2.14 For the second phase from 2027, all States that have an individual share of international aviation activities in year 2018 RTKs (revenue tonne kilometres) higher than 0.5 per cent of total RTKs, or whose cumulative share in the list of States from the highest to the lowest amount of RTKs reaches 90 per cent of total RTKs, are required to participate, except Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) unless they volunteer.

2.15 The CORSIA is based on a route-based approach. This means that emissions from international flights between two States, where both the origin and destination States participate in the CORSIA, are covered by offsetting requirements of the scheme. On the other hand, emissions from international flights between two States, where the origin and/or destination States do not participate in the CORSIA, are excluded from the offsetting requirements of the scheme.

2.16 Once participating States and air-routes between the participating States to be covered by the CORSIA are defined every year from 2021, as described above, the amount of CO_2 offsetting requirements for individual operators is calculated as follows:

[4] https://www.icao.int/Meetings/CAAF2/Pages/default.aspx

a) during the period from 2021 through 2029, the amount of CO_2 offsetting requirements is calculated by multiplying the operators' annual emissions with a single sectoral growth factor every year, following a so-called 100 per cent sectoral approach; and

b) from 2030, the amount of CO_2 offsetting requirements is calculated following a hybrid approach that takes into account both the sectoral growth factor and growth factors of individual operators: the individual factors' contribution to the calculation of CO_2 offsetting requirements will be at least 20 per cent from 2030 to 2032; and at least 70 per cent from 2033 to 2035.

2.17 Starting in 2022, the CORSIA will be periodically reviewed, every three years, by the ICAO Council. The review will include, among other features, the assessment of its impact on the growth of international aviation, and the results of this assessment will serve as a basis for the Council to recommend, as appropriate, adjustments to the scheme for the consideration by the Assembly.

2.18 To ensure the timely implementation of CORSIA, ICAO and its Member States have been prioritizing efforts in undertaking necessary preparatory activities. In September 2017, the ICAO Council's CAEP has developed draft rules and guidance, including for a robust Monitoring, Reporting and Verification (MRV) system of CO_2 emissions from international aviation, which are currently under review by the ICAO process, aiming for the final adoption by the ICAO Council in June 2018.

2.19 The CORSIA MRV rules, once adopted, will need to be implemented by all Member States that have airlines with international flights, from 1 January 2019, in order to calculate the CORSIA's baseline as the average of 2019 and 2020 emissions, as well as the offsetting requirements of individual airlines from 2021 every year. ICAO will also determine eligible emissions units, or carbon credits, which airlines will purchase in order to meet the offsetting requirements.

2.20 To ensure the successful implementation of CORSIA by Member States, ICAO has also undertaken the capacity building and assistance programme, including the organization of regional seminars in all ICAO regions[5], and development of brochures and on-line tutorials[6] related to CORSIA. ICAO will convene another series of regional seminars in March / April 2018.

3. STATE ACTION PLANS

3.1 ICAO continues to further update the tools and guidance made available to support States in developing and improving their action plans. In March / April 2017, a series of regional seminars in five venues (Brazil, Egypt, Germany, Indonesia and Kenya) were organized[6] to disseminate relevant guidance material and providing hands-on training to States. To date, 104 Member States of ICAO, representing more than 90 per cent of global international aviation traffic, voluntarily prepared and submitted action plans to ICAO.

3.2 Substantial progress has also been made under the two existing ICAO environmental partnerships on capacity-building and assistance. The ICAO partnership with the European Union launched in 2013 enabled all 14 selected States in Africa and the Caribbean to develop and submit their action plans to ICAO and install a tailor-made Aviation Environmental System (AES) that supports robust monitoring, verification and reporting of data.

3.3 The ICAO-European Union (EU) project is also facilitating the implementation of CO2 mitigation measures, such as operational improvements, use of renewable energy for aircraft at airport gates, and feasibility studies on the use of sustainable aviation fuels. Under the project, and in

[5] http://www.icao.int/Meetings/RS2017/Pages/Documentation.aspx
[6] https://www.icao.int/environmental-protection/Pages/market-based-measures.aspx

cooperation with the United Nations Institute for Training and Research (UNITAR), dedicated training material, consisting of an e-learning course and e-books on State Action Plans and mitigation measures, has been developed.

3.4 The partnership with the United Nations Development Programme (UNDP) and Global Environmental Facility (GEF) aims to provide the Small Island Developing States (SIDS) with guidance documents on cost-benefit analysis for mitigation measures, clean energy projects and environmental governance. This partnership will also allow for the installation of solar panels at the airport gate of two international airports in Jamaica, which creates the opportunity for other SIDS to replicate this project and multiply the associated environmental benefits.

4. UNFCCC – CLIMATE FINANCE

4.1 While the Paris Agreement and associated COP21 decision did not include reference to international aviation, one of the key elements in the Agreement is that developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, with a concrete roadmap to achieve the goal of jointly providing USD 100 billion annually by 2020 for mitigation and adaptation through 2025, while the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) shall set a new financial goal prior to 2025 from a floor of USD 100 billion per year (Paris Agreement, Article 9, paragraph 3, and associated COP21 Decision, paragraphs 53 and 114).

4.2 It should be highlighted that in 2010, ICAO Member States adopted global aspirational goals for the international aviation sector of improving the sector's fuel efficiency by 2 per cent per year and keeping its global CO_2 emissions from 2020 at the same level (carbon neutral growth from 2020), and these aspirational goals were affirmed by the subsequent sessions of the ICAO Assembly in 2013 and 2016.

4.3 The achievement of the ICAO global aspirational goals requires adequate financial resources within the sector itself, enabling it to effectively respond to the global climate change challenge. It is of utmost importance that the adopted global MBM scheme for international aviation – CORSIA be treated as one element of a basket of mitigation measures to achieve the ICAO global aspirational goals, and not in isolation. The growing commitment of ICAO partners to support ICAO's capacity building and assistance efforts also demonstrates how critical these activities are to the achievement of ICAO's global aspirational goals.

4.4 In this regard, the 39th Assembly urged that "*ICAO and its Member States express a clear concern, through the UNFCCC process, on the use of international aviation as a potential source for the mobilization of revenue for climate finance to the other sectors, in order to ensure that international aviation would not be targeted as a source of such revenue in a disproportionate manner*" (Assembly Resolution A39-2, paragraph 16).

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APPENDIX A

Declaration adopted by the second ICAO Conference on Aviation Alternative Fuels (CAAF/2) (Mexico City, Mexico, 11 to 13 October 2017)

Whereas the ICAO 39th Assembly recognized the importance of research and development in fuel efficiency and alternative fuels for aviation that will enable international air transport operations with a lower environmental impact, both in terms of local air quality and the global climate;

Whereas the ICAO 39th Assembly requested the Council to continuously monitor the implementation of all elements of the basket of measures and consider the necessary policies and actions to ensure that progress is achieved in all of the elements in a balanced way with an increasing percentage of emissions reductions accruing from non-MBM measures over time;

Noting that the introduction of sustainable aviation fuels (SAF) is one of the measures that can contribute significantly to ICAO's climate objectives and to the goal set forth in ICAO Assembly Resolution A39-2, and address environmental challenges facing aviation, and may also realize economic, social, and environmental advantages that contribute to the ambitious and transformational vision set out in 13 out of 17 of the United Nations Sustainable Development Goals;

Whereas the ICAO 39th Assembly acknowledged the need for SAF to be developed and deployed in an economically feasible, socially and environmentally acceptable manner, and progress achieved in the harmonization of the approaches to sustainability;

Noting that, since CAAF/1 in 2009, significant progress developing a SAF industry has occurred, including establishing an internationally recognized specification, reducing SAF production costs, and starting commercial SAF deployment at locations around the world;

Acknowledging that ICAO has been successfully fostering international cooperation by means of dedicated workshops and seminars and should continue to do so, and also *welcoming* the ICAO initiative on State Action Plans, including those measures related to development and deployment of SAF;

Acknowledging the challenges faced by the emerging SAF industry in competing with the well-established CAF industry, and the need for financial mechanisms and policies to ensure the competitiveness of SAF and reduce the risk of SAF investments. This includes reducing time and expenses required for technical certification of SAF;

Recognizing that States and industry have the primary role in SAF deployment and that public-private partnerships have been, and will continue to be, instrumental to SAF deployment;

Acknowledging the availability of SAF onsite at airports is an element that could facilitate the deployment of SAF on a commercial scale;

Noting that the aviation industry is already facilitating the use of SAF on a regular basis, with several airlines using SAF and airports receiving SAF on an ad-hoc basis, or are in the process of enabling supplies of SAF;

Acknowledging that global and interdisciplinary collaborations are needed for technical certification of SAF, and that inter-institutional and inter-sectoral coordination is needed for developing policies, research, and financing for SAF to avoid inconsistent actions;

Acknowledging the importance of having a variety of funding sources throughout the development cycle of the SAF industry;

Recognizing that the environmental benefits of SAF production and use are valuable. However, airports' initiatives on SAF are highly dependent on airport ownership formats, a clear business case, stakeholder partnerships, and local subsidies, grants or other incentives available at particular airports, as well as appropriate engagement and collaboration with commercial and business aircraft operators;

Noting that commercial aviation has currently no alternatives to liquid fuels as a source of energy, while in many cases ground transportation can rely on other sources such as electricity. For these reasons, States should be encouraged to promote the use of SAF for the aviation sector or policies that strive to establish a level playing field between aviation and other transportation sectors;

Noting the several potential policy options for incentivizing SAF production and deployment, such as SAF blending mandates or targets, subsidies, production facility grants, loan guarantees, and tax credits.

***Declares** that:*

1. The Conference endorses the 2050 ICAO Vision for Sustainable Aviation Fuels as a living inspirational path and calls on States, industry and other stakeholders, for a significant proportion of conventional aviation fuels (CAF) to be substituted with sustainable aviation fuels (SAF) by 2050, for international civil aviation to reduce carbon emissions significantly, and whilst pursuing all opportunities in the basket of mitigation measures to reduce emissions as necessary;

2. The Conference recognizes that the sustainability of alternative aviation fuels is of essential importance to the efforts of international civil aviation to reduce its CO_2 emissions. This is ensured by application of sustainability criteria to SAF as is currently under consideration by ICAO;

3. The Conference notes that this path is based on the assumptions of a progressive increased use of SAF, and should be periodically reviewed through a stocktaking process to continuously assess progress on the SAF development and deployment, including the necessity to consider policies and actions, and the organization of regular workshops and seminars, leading up to the convening of CAAF/3 no later than 2025, with a view to updating the 2050 ICAO Vision to include a quantified proportion of CAF to be substituted with SAF by 2050, and carbon reductions achieved by SAF;

4. ICAO and its Member States, in cooperation with the aviation industry and other stakeholders, will work together to pursue any opportunities to implement necessary policies, technology and financing measures, with an increasing proportion of SAF into the fuel supply over time towards the 2050 ICAO Vision, without any attribution of specific obligations to individual States;

5. ICAO will act primarily as a facilitator to support States on their efforts to develop and deploy SAF, by sharing information and best practices, communicating the economic and environmental value of SAF, facilitating discussions between financial institutions and industry, and developing guidance material;

6. ICAO will facilitate capacity building and assistance for States to develop and deploy SAF that are well suited to their national circumstances and resources;

7. ICAO, States, and stakeholders should develop guidance materials describing the drop-in nature of SAFs to support SAF deployment by aircraft operators, including for the integration of SAF into the hydrant system; and on the different models available for funding, incentives, development, and transfer of technology for SAF;

8. States are encouraged to support ICAO efforts for international cooperation on SAF development and deployment by sharing examples of policy implementation, results, and lessons learned, which could be useful to other States and CAEP work, as well as other ICAO outreach and capacity building initiatives;

9. ICAO should continue to work with States, industry and other stakeholders to update the Global Framework on Aviation Alternative Fuels (GFAAF);

10. States are encouraged to support the approval of new conversion processes under development, and explore means and policies for reducing time and expenses required for technical certification of SAF, such as the D4054 Clearinghouse concept;

11. States are encouraged to support the development and implementation of stable policy frameworks that facilitate the deployment of SAF, including via policy incentives, collaborative research, and assistance, while avoiding distortions of fair competition;

12. States are encouraged to develop policies that promote the use of SAF, or promote policies that strive to establish a level playing field between aviation and other transportation sectors on the use of sustainable fuels;

13. States are encouraged to evaluate the policy effectiveness by means of qualitative metrics such as flexibility, certainty, financial costs and benefits, price sensitivity to externalities, ease of implementation, contribution to SAF deployment and CO_2 reduction, unintended consequences, and robustness, while recognising the importance of quantitative metrics to inform policy decisions;

14. States are encouraged to provide examples of successful renewable energy and SAF policy implementation case studies; results and possible lessons learned, which could be useful to other States and current CAEP work, and could be used to promote the economic, social, and environmental advantages that may arise from the development of a SAF industry;

15. States are encouraged to evaluate available funding sources, and to the extent possible, facilitate accessibility to funding sources appropriate to development needs. This includes supporting airlines and airports that decide to implement the supply of SAFs and support new feasibility studies for the supply of SAFs at airports;

16. States are encouraged to promote collaborative initiatives amongst States, and with industry, in supporting global efforts to pursue price parity between SAF and CAF, including utilizing of existing facilities to produce SAF, and identifying and exploring sustainable feedstock resources and conversion processes;

17. States are encouraged to foster the further development of innovative technological pathways to produce SAF from sources such as renewable electricity, while additional efforts should be made to scale up the market of these fuels;

18. The 2050 ICAO Vision does not set a precedent for or prejudge the work to be undertaken by the ICAO Council regarding the exploration of a long term global aspirational goal for international aviation under paragraph 9 of Assembly Resolution A39-2, or the periodic review of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) under paragraph 18 of Assembly Resolution A39-3.

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APPENDIX B

ICAO Assembly Resolution A39-3: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme

Whereas Assembly Resolution A38-18 decided to develop a global market-based measure (GMBM) scheme for international aviation, for decision by the 39th Session of the Assembly;

Recalling that Assembly Resolution A38-18 requested the Council, with the support of Member States, to finalize the work on the technical aspects, environmental and economic impacts and modalities of the possible options for a GMBM scheme, including on its feasibility and practicability, taking into account the need for development of international aviation, the proposal of the aviation industry and other international developments, as appropriate, and without prejudice to the negotiations under the UNFCCC;

Also recalling that Assembly Resolution A38-18 requested the Council, with the support of Member States, to identify the major issues and problems, including for Member States, and make a recommendation on a GMBM scheme that appropriately addresses them and key design elements, including a means to take into account special circumstances and respective capabilities, and the mechanisms for the implementation of the scheme from 2020 as part of a basket of measures which also include technologies, operational improvements and sustainable alternative fuels to achieve ICAO's global aspirational goals;

Recognizing that ICAO is the appropriate forum to address emissions from international aviation, and the significant amount of work undertaken by the Council, its Environment Advisory Group (EAG) and its Committee on Aviation Environmental Protection (CAEP) to develop a recommendation for a GMBM scheme and its design elements and implementation mechanisms, including the analyses of various approaches for distribution of obligations;

Further recalling that Assembly Resolution A38-18 requested the Council, with the support of Member States, to organize seminars, workshops on a GMBM scheme for international aviation participated by officials and experts of Member States as well as relevant organizations;

Recognizing the convening of two rounds of Global Aviation Dialogues (GLADs) seminars held in 2015 and 2016 for all regions;

Noting the support of the aviation industry for a single global carbon offsetting scheme, as opposed to a patchwork of State and regional MBMs, as a cost effective measure to complement a broader package of measures including technology, operations and infrastructure measures;

Recognizing that MBMs should not be duplicative and international aviation CO_2 emissions should be accounted for only once;

Emphasizing that the decision by the 38th Session of the Assembly to develop a global MBM scheme for international aviation reflects the strong support of Member States for a global solution for the international aviation industry, as opposed to a possible patchwork of State and regional MBMs;

Reaffirming the concern with the use of international civil aviation as a potential source for the mobilization of revenue for climate finance to the other sectors, and that MBMs should ensure the fair treatment of the international aviation sector in relation to other sectors;

Recalling the UNFCCC and the Paris Agreement and *acknowledging* its principle of common but differentiated responsibilities and respective capabilities, in light of different national circumstances;

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

Welcoming the adoption of the Paris Agreement under the UNFCCC and *recognizing* that the work related to a global MBM scheme for international aviation and its implementation will contribute to the achievement of the goals set out in the Paris Agreement;

Whereas the UNFCCC and the Paris Agreement provide for mechanisms, such as the Clean Development Mechanism (CDM) and a new market mechanism under the Paris Agreement, to contribute to the mitigation of GHG emissions to support sustainable development, which benefit developing States in particular;

Welcoming the cooperation between the United Nations Framework Convention on Climate Change (UNFCCC) and ICAO on the development of CDM methodologies for aviation;

Recognizing that this Resolution does not set a precedent for or prejudge the outcome of negotiations under the UNFCCC, the Paris Agreement, or other international agreements, nor represent the position of the Parties to the UNFCCC, the Paris Agreement, or other international agreements;

The Assembly:

1. *Resolves* that this Resolution, together with Resolution A39-1: *Consolidated statement of continuing ICAO policies and practices related to environmental protection - General provisions, noise and local air quality* and Resolution A39-2: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change*, supersede Resolutions A38-17 and A38-18 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;

2. *Acknowledges* the progress achieved on all elements of the basket of measures available to address CO_2 emissions from international aviation, including aircraft technologies, operational improvements, sustainable alternative fuels and a GMBM scheme and any other measures, and *affirms* the preference for the use of aircraft technologies, operational improvements and sustainable alternative fuels that provide the environmental benefits within the aviation sector;

3. *Also acknowledges* that, despite this progress, the environmental benefits from aircraft technologies, operational improvements and sustainable alternative fuels may not deliver sufficient CO_2 emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO_2 emissions from international aviation from 2020 at the same level;

4. *Emphasizes* the role of a GMBM scheme to complement a broader package of measures to achieve the global aspirational goal, without imposing inappropriate economic burden on international aviation;

5. *Decides* to implement a GMBM scheme in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to address any annual increase in total CO_2 emissions from international civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country) above the 2020 levels, taking into account special circumstances and respective capabilities;

6. *Requests* the Council to continue to ensure all efforts to make further progress on aircraft technologies, operational improvements and sustainable alternative fuels be taken by Member States and reflected in their action plans to address CO_2 emissions from international aviation, and to monitor and report the progress on implementation of action plans, and that a methodology should be

developed to ensure that an aircraft operator's offsetting requirements under the scheme in a given year can be reduced through the use of sustainable alternative fuels, so that all elements of the basket of measures are reflected;

7. *Request* the Council to continuously monitor the implementation of all elements of the basket of measures, and consider the necessary policies and actions to ensure that progress is achieved in all of the elements in a balanced way with an increasing percentage of emissions reductions accruing from non-MBM measures over time;

8. *Acknowledges* special circumstances and respective capabilities of States, in particular developing States, in terms of vulnerability to the impacts of climate change, economic development levels, and contributions to international aviation emissions, among other things, while minimizing market distortion;

9. *Decides* the use of a phased implementation for the CORSIA to accommodate the special circumstances and respective capabilities of States, in particular developing States, while minimizing market distortion, as follows:

a) Pilot phase applies from 2021 through 2023 to States that have volunteered to participate in the scheme. States participating in this phase may determine the basis of their aircraft operator's offsetting requirements from paragraph 11 e) i) below;

b) First phase applies from 2024 through 2026 to States that voluntarily participate in the pilot phase, as well as any other States that volunteer to participate in this phase, with the calculation of offsetting requirements in paragraph 11 a) below;

c) All States are strongly encouraged to voluntarily participate in the pilot phase and the first phase, noting that developed States, which have already volunteered, are taking the lead, and that several other States have also volunteered;

d) The Secretariat will make public on the ICAO website updated information on the States that volunteered to participate in the pilot phase and first phase;

e) Second phase applies from 2027 through 2035 to all States that have an individual share of international aviation activities in RTKs in year 2018 above 0.5 per cent of total RTKs or whose cumulative share in the list of States from the highest to the lowest amount of RTKs reaches 90 per cent of total RTKs, except Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) unless they volunteer to participate in this phase;

f) States that are exempted or have not yet participated are strongly encouraged to voluntarily participate in the scheme as early as possible, in particular those States that are members of a regional economic integration organization. States who decide to voluntarily participate in the scheme, or decide to discontinue the voluntary participation from the scheme, may only do so from 1 January in any given year and they shall notify ICAO of their decision by no later than 30 June of the preceding year;

g) Starting in 2022, the Council will conduct a review of the implementation of the CORSIA every three years, including its impact on the growth of international aviation, which serves as an important basis for the Council to consider whether it is necessary to make adjustments to the next phase or compliance cycle and, as appropriate, to recommend such adjustments to the Assembly for its decision;

10. *Decides* that the CORSIA shall apply to all aircraft operators on the same routes between States with a view to minimizing market distortion, as follows:

a) all international flights on the routes between States, both of which are included in the CORSIA by paragraph 9 above, are covered by the offsetting requirements of the CORSIA;

b) all international flights on the routes between a State that is included in the CORSIA and another State that is not included in the CORSIA by paragraph 9 above are exempted from the offsetting requirements of the CORSIA, while retaining simplified reporting requirements; and

c) all international flights on the routes between States, both of which are not included in the CORSIA by paragraph 9 above, are exempted from the offsetting requirements of the CORSIA, while retaining simplified reporting requirements;

11. *Decides* that the amount of CO_2 emissions required to be offset by an aircraft operator in a given year from 2021 is calculated every year as follows:

a) an aircraft operator's offset requirement = [% Sectoral × (an aircraft operator's emissions covered by CORSIA in a given year × the sector's growth factor in the given year)] + [% Individual × (an aircraft operator's emissions covered by CORSIA in a given year × that aircraft operator's growth factor in the given year);

b) where the sector's growth factor = (total emissions covered by CORSIA in the given year – average of total emissions covered by CORSIA between 2019 and 2020) / total emissions covered by CORSIA in the given year;

c) where the aircraft operator's growth factor = (the aircraft operator's total emissions covered by CORSIA in the given year – average of the aircraft operator's emissions covered by CORSIA between 2019 and 2020) / the aircraft operator's total emissions covered by CORSIA in the given year;

d) where the % Sectoral = (100% – % Individual) and;

e) where the % Sectoral and % Individual will be applied as follows:

i) from 2021 through 2023, 100% sectoral and 0% individual, though each participating State may choose during this pilot phase whether to apply this to:

a) an aircraft operator's emissions covered by CORSIA in a given year, as stated above, or

b) an aircraft operator's emissions covered by CORSIA in 2020;

ii) from 2024 through 2026, 100 % sectoral and 0% individual;

iii) from 2027 through 2029, 100 % sectoral and 0% individual;

iv) from 2030 through 2032, at least 20% individual, with the Council recommending to the Assembly in 2028 whether and to what extent to adjust the individual percentage;

v) from 2033 through 2035, at least 70% individual, with the Council recommending to the Assembly in 2028 whether and to what extent to adjust the individual percentage;

f) the aircraft operator's emissions and the total emissions covered by CORSIA in the given year do not include emissions exempted from the scheme in that year;

g) the scope of emissions in paragraphs 11 b) and 11 c) above will be recalculated at the start of each year to take into account routes to and from all States that will be added due to their voluntary participation or the start of a new phase or compliance cycle;

12. *Decides* that a new entrant[7] is exempted from the application of the CORSIA for three years or until the year in which its annual emissions exceed 0.1 per cent of total emissions in 2020, whichever occurs earlier. From the subsequent year, the new entrant is included in the scheme and treated in the same way as the other aircraft operators.

13. *Decides* that, notwithstanding with the provisions above, the CORSIA does not apply to low levels of international aviation activity with a view to avoiding administrative burden: aircraft operators emitting less than 10,000 metric tonnes of CO_2 emissions from international aviation per year; aircraft with less than 5,700 kg of Maximum Take Off Mass (MTOM); or humanitarian, medical and firefighting operations;

14. *Decides* that the emissions that are not covered by the scheme, as the results of phased implementation and exemptions, are not assigned as offsetting requirements of any aircraft operators included in the scheme;

15. *Notes* the work of the Council, with the technical contribution of CAEP, on: a) the monitoring, reporting and verification (MRV) system; b) recommended criteria for emissions units to be purchased by aircraft operators that take into account developments in the UNFCCC process; c) and registries under the CORSIA, and *requests* the Council, with the technical contribution of CAEP, to complete its work as soon as possible including the provision of capacity building and assistance, so as to enable the full implementation of the CORSIA from 2020;

16. *Decides* a three year compliance cycle, starting with the first cycle from 2021 to 2023, for aircraft operators to reconcile their offsetting requirements under the scheme, while they report the required data to the authority designated by the aircraft operator's State of registry every year;

17. *Decides* on the need to provide for safeguards in the CORSIA to ensure the sustainable development of the international aviation sector and against inappropriate economic burden on international aviation, and *requests* the Council to decide the basis and criteria for triggering such action and identify possible means to address these issues*;*

18. *Decides* that a periodic review of the CORSIA is undertaken by the Council, for consideration by the Assembly, every three years from 2022 for the purpose referred to in paragraph 9 g) above and to contribute to the sustainable development of the international aviation sector and the effectiveness of the scheme. This will involve, inter alia:

a) assessment of: progress towards achieving the ICAO's global aspirational goal; the scheme's market and cost impact on States and aircraft operators and on international aviation; and the functioning of the scheme's design elements;

b) consideration of the scheme's improvements that would support the purpose of the Paris Agreement, in particular its long-term temperature goals; and update the scheme's design elements to improve implementation, increase effectiveness, and minimize market distortion,

[7] A new entrant is defined as any aircraft operator that commences an aviation activity falling within the scope of the scheme on or after its entry into force and whose activity is not in whole or in part a continuation of an aviation activity previously performed by another aircraft operator.

taking into account the consequential impact of changing the scheme's design elements, e.g., to MRV requirements; and

c) a special review by the end of 2032 on termination of the scheme, its extension or any other improvements of the scheme beyond 2035, including consideration of the contribution made by aircraft technologies, operational improvements and sustainable alternative fuels towards achieving the ICAO's environmental objectives;

19. *Determines* that the CORSIA or any other scheme decided by the Assembly is to be the market-based measure applying to CO_2 emissions from international aviation;

20. *Requests* the following actions be taken, with a view to establishing necessary mechanisms for implementation of the CORSIA from 2020:

Regarding the implementation of the MRV system,

a) the Council to develop, with the technical contribution of CAEP, the SARPs and related guidance material for the implementation of the MRV system under the CORSIA, including simplified MRV procedures, for adoption by the Council by 2018;

b) all Member States whose aircraft operator undertakes international flights to develop the necessary arrangements, in accordance with the MRV SARPs, for implementation from 1 January 2019;

Regarding the Emissions Unit Criteria (EUC),

c) the Council to develop, with the technical contribution of CAEP, the SARPs and related guidance material for Emissions Unit Criteria (EUC) to support the purchase of appropriate emissions units by aircraft operators under the scheme, taking into account relevant developments in the UNFCCC and Article 6 of the Paris Agreement, for adoption by the Council as soon as possible but not later than 2018;

d) the Council to establish, with the technical contribution of CAEP, a standing technical advisory body on the Emissions Unit Criteria (EUC) to make recommendations to the Council on the eligible emissions units for use by the CORSIA;

e) the Council, with the technical contribution of CAEP, to periodically review the EUC SARPs and related guidance material, as appropriate, to promote compatibility with future relevant decisions under the Paris Agreement;

Regarding the establishment of Registries,

f) the Council to develop, with the technical contribution of CAEP, policies and related guidance material to support the establishment of registries under the scheme, for adoption by the Council by 2018;

g) the Council to establish a consolidated central registry under the auspices of ICAO, for operationalization no later than 1 January 2021;

h) Member States to develop necessary arrangements for the establishment of their own registries or group registries established by groups of States, or to arrange for participation in other registries, in accordance with the ICAO guidance;

Regarding the governance of the CORSIA,

i) the Council to oversee the functioning of the CORSIA, with support provided by the standing technical advisory body and CAEP as needed;

Regarding the regulatory framework,

j) Member States to take necessary action to ensure that the necessary national policies and regulatory framework be established for the compliance and enforcement of the scheme by 2020.

21. *Decides* that emissions units generated from mechanisms established under the UNFCCC and the Paris Agreement are eligible for use in CORSIA, provided that they align with decisions by the Council, with the technical contribution of CAEP, including on avoiding double counting and on eligible vintage and timeframe;

22. *Decides* that ICAO and Member States take all necessary actions in providing the capacity building and assistance and building partnerships for implementation of the CORSIA from 2020, including:

Regarding the implementation of the MRV system,

a) the Council to take necessary action to expand the provision of capacity building and assistance for the preparation and implementation on Member States' action plans, in order to accommodate capacity building and assistance for implementation of the MRV system by Member States from 1 January 2019, including organization of seminars and training in all regions from 2017, and facilitation of financial support where needed, in particular for those States that volunteer to participate in the pilot phase and require support to do so;

b) Member States to build partnerships among themselves to cooperate on the implementation of the MRV system;

Regarding the establishment of Registries,

c) the Council to take necessary action to expand the provision of capacity building and assistance for the preparation and implementation on Member States' action plans, in order to accommodate capacity building and assistance for establishment of registries by States, including organization of seminars and training in all regions from 2017, and facilitation of financial support where needed, in particular for those States that volunteer to participate in the pilot phase and require support to do so;

d) Member States to build partnerships among themselves to cooperate on the establishment of their own registries or group registries established by groups of States, and possible pilot implementation;

23. *Decides* that the CORSIA will use emissions units that meet the Emissions Unit Criteria (EUC) in paragraph 20 above;

24. *Requests* the Council to promote the use of emissions units generated that benefit developing States, and *encourages* States to develop domestic aviation-related projects;

25. *Requests* the Council to explore further development of aviation-related methodologies for use in offsetting programmes, including mechanisms or other programmes under the UNFCCC, and *encourages* States to use such methodologies in taking actions to reduce aviation CO_2 emissions, which could further enable the use of credits generated from the implementation of such programmes by the CORSIA, without double-counting of emissions reduction;

— END —