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UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

**The Forty-eighth Session of the UNFCCC Subsidiary Body for
Scientific and Technological Advice (SBSTA48)**

30 April to 10 May 2018 – Bonn, Germany

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

Submission by the International Civil Aviation Organization (ICAO)

Executive Summary

ICAO has made significant progress on the development and implementation of a basket of measures to achieve its global aspirational goals of 2 per cent annual fuel efficiency improvement and carbon neutral growth from 2020. The ICAO basket of measures includes aircraft technology, operational improvements, sustainable aviation fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

In 2017, ICAO adopted the first ever global certification CO₂ Standard for aeroplanes. Operational improvements also bear a significant CO₂ emissions reduction potential, including through the ICAO's Aviation System Block Upgrades strategy.

The second ICAO Conference on Aviation Alternative Fuels was held in Mexico City in October 2017. The Conference adopted Recommendations and subsequently a Declaration was approved for further work by ICAO, Member States and other stakeholders. As part of the Declaration, the Conference endorsed 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 to be substituted with sustainable aviation fuels by 2050. The ICAO Council endorsed the Declaration during its March 2018 Council Session.

Draft Standards and Recommended Practices and an ICAO tool for a robust Monitoring, Reporting and Verification system of CO₂ emissions from international aviation are under final review, for expected adoption by the ICAO Council in June 2018. ICAO will also determine eligible emissions units that airlines can purchase in order to meet their offsetting requirements under CORSIA.

To ensure the successful implementation of CORSIA, ICAO has launched a capacity building and assistance programme, including regional seminars in all ICAO regions in March and April 2018, in order for Member States and airlines to have a clear understanding of the detailed procedures and required actions for the CORSIA implementation from 2019. Following the expected adoption of CORSIA Standards in June 2018, ICAO will convene an additional seminar in Montreal from 2 to 3 July 2018 to further inform on the progress made on other related matters, including on the CORSIA Central Registry and the ICAO CO₂ Estimation and Reporting Tool.

With the increasing engagement of Member States and in close cooperation with the aviation industry and other international organizations, ICAO will continue to lead in the efforts to reduce CO₂ emissions from international aviation.

1. INTRODUCTION

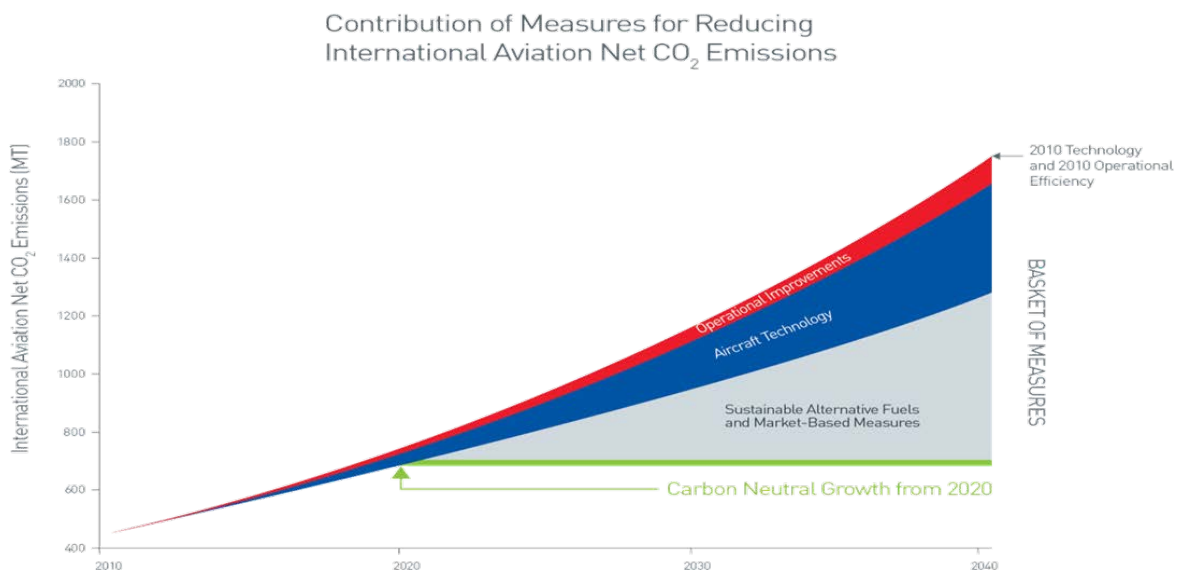
1.1 The work of ICAO in addressing greenhouse gas emissions from international aviation is underpinned by two Resolutions that were adopted during the 39th Session of the ICAO Assembly:

- 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*” (Appendix A).

1.2 These two Resolutions describe what needs to be accomplished during the current triennium (2017-2019) through the development and implementation of the ICAO basket of measures in order to achieve ICAO’s global aspirational goals for international aviation of improving fuel efficiency by 2 per cent per year and keeping its CO₂ emissions from 2020 at the same level (carbon neutral growth from 2020).

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

1.4 Since its last report to the UNFCCC in May 2017, ICAO has made significant progress on the implementation of the basket of measures, which is described in the following sections.



Reference: ICAO Committee on Aviation Environmental Protection

2. AIRCRAFT TECHNOLOGY

2.1 In 2017, the new CO₂ emissions Standard was adopted by the ICAO Council as a new Volume to Annex 16 (Volume III) to the Convention on International Civil Aviation. This new Standard is the first global Standard for CO₂ emissions of any sector. It 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 CO₂ 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.

2.2 The likelihood of an electric aircraft entering service has increased over the past ten years, including all-electric, hybrid-electric, partially turboelectric, and turboelectric aircraft. Research is on-going into this area and ICAO will continue to monitor technologies and develop the relevant Standards and Recommend Practices for these new aircraft as necessary.

3. OPERATIONAL IMPROVEMENTS

3.1 Recognizing that many of the operational improvements defined in the ICAO Global Air Navigation Plan offer the potential to deliver fuel and CO₂ emissions reduction, an analysis of environmental benefits from the implementation of such measures has been conducted. Activities in this triennium include the estimation of CO₂ reduction benefits from the implementation of Aviation System Block Upgrades (ASBUs) strategy – Block 1, which follows a previous environmental assessment of Block 0 modules. The outcome of the ASBU Block 1 analysis is expected to further inform the global aviation community on the potential environmental benefits to be accrued from the implementation of Block 1 modules.

3.2 ICAO, through its Committee on Aviation Environmental Protection (CAEP), has reviewed possible environmental indicators in the context of the Global Air Navigation Plan. The outcome of this work will be presented at the 13th Air Navigation Conference in October 2018.

4. SUSTAINABLE AVIATION FUELS

4.1 Following the recognition by the 39th Assembly of the continuing ICAO support to States and other stakeholders in their efforts to develop and deploy sustainable aviation fuels, the ICAO Council agreed to convene a second ICAO Conference on Aviation Alternative Fuels (CAAF/2), with a view to developing an ICAO vision on sustainable aviation fuels, and encouraging States to take action at national and international levels to further develop and deploy sustainable aviation fuels.

4.2 CAAF/2 was held in Mexico City, Mexico in October 2017. The Conference adopted Recommendations and subsequently a Declaration (see Appendix B) was approved for further work by ICAO, Member States and other stakeholders. As a part of the Declaration, the Conference endorsed 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. The ICAO Council endorsed the Declaration during its March 2018 Council session.

4.3 The Conference noted 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. The organization of regular workshops and seminars will also lead 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.

4.4 In addition, CAAF/2 recognized that the sustainability of aviation fuels is of essential importance to the efforts to reduce international aviation CO₂ emissions, with the understanding that the application of sustainability criteria is currently under consideration by ICAO, as part of the work on CORSIA.

4.5 ICAO has been supporting Member States to assess the potential development and use of SAF, as a measure to reduce CO₂ emissions from international aviation. As part of the technical assistance activities, ICAO, through an ICAO-European Union project, has completed four sustainable aviation fuel feasibility studies in Burkina Faso, Dominican Republic, Kenya and Trinidad and Tobago. These studies include a roadmap with proposed actions for these States to embark in the production or use of SAF as part of their State Action Plans.

4.6 CAEP is making progress on other technical specifications to complete its recommendations related to sustainable aviation fuels (i.e., the development of default life-cycle emissions values and methodologies, and requirements for Sustainability Certification Schemes (SCS)). CAEP is also working on a recommendation to establish a specialized technical body to assist the Council in deciding which SCS would be eligible to determine the sustainability of aviation fuels.

5. CORSIA IMPLEMENTATION

5.1 To ensure the timely implementation of CORSIA, which starts on 1 January 2019, ICAO and its Member States have been prioritizing efforts in undertaking preparatory activities. The CAEP has assisted the ICAO Council to develop draft Standards and Recommended Practices (SARPs) for CORSIA, and the ICAO CO₂ Estimation and Reporting Tool (CERT). The draft CORSIA SARPs are currently under final review. It is anticipated that the ICAO Council will adopt a final version of the SARPs by the end of June 2018.

5.2 The ICAO Council, with the assistance of CAEP, is continuing its work on the determination of eligible emissions units, which airlines can purchase in order to meet their offsetting requirements under CORSIA. In November 2017, the ICAO Council provisionally approved Emissions Units Criteria, as part of the CORSIA Implementation Elements, pending the receipt of States' comments on the draft CORSIA SARPs, so that CAEP can make further progress on the informal testing of some sample programmes that produce emission units against the criteria. The results on this informal testing will be considered by the ICAO Council in November 2018.

5.3 The ICAO Secretariat has developed outreach products on the basis of the draft CORSIA package components, including a video on CORSIA implementation with a focus on the Monitoring, Reporting and Verification (MRV) process; a brochure on CORSIA that contains the implementation action list and timeline for States, operators and ICAO; and leaflets on CORSIA that highlight various topics on implementation aspects of CORSIA, such as emissions monitoring plans, the CERT, and CORSIA offsetting requirements.

5.4 An ICAO Seminar on Carbon Markets was held at the ICAO Headquarters from 7 to 9 February 2018 with the aim to raise understanding on carbon markets and better prepare States for the upcoming discussions on emissions units for CORSIA. Presentations during the seminar provided information on various aspects of emissions units programmes, carbon market mechanisms and projects, including the Clean Development Mechanism (CDM), JI and on-going work under Article 6 of the Paris Agreement. A wide range of presenters were invited, including representatives of UN

mechanisms; programmes and projects in compliance markets; as well as programmes and projects in voluntary markets.

5.5 To assist States prepare for the implementation of CORSIA in 2019, ICAO is conducting three-day regional seminars in five venues (Guatemala, the former Yugoslav Republic of Macedonia, Egypt, South Africa, and Australia). The objective of these events is to share information on the CORSIA implementation requirements regarding MRV in order for participants to have a clear understanding of the detailed procedures and required actions, as well as related responsibilities, among relevant stakeholders involved in the CORSIA implementation. The information presented at these regional seminars is based on the draft CORSIA SARPs that were developed by the Council in 2017.

5.6 Following the expected adoption of the CORSIA SARPs in June 2018, ICAO will convene an additional seminar in Montreal from 2 to 3 July 2018 to further inform on the progress made on other related matters, including on the CORSIA Central Registry and the CERT.

6. STATES' VOLUNTARY ACTION PLANS AND ASSISTANCE

6.1 Most assistance provided to States on environment is delivered within the framework of the States' action plans on international aviation CO₂ emissions reduction activities and, following the 39th Session of the ICAO Assembly, on CORSIA.

6.2 The action plans are a strategic tool, which allow States to lay down a long-term vision for the evolution of international civil aviation CO₂ emissions, in full coordination with their international aviation stakeholders. This cooperation process facilitates the identification from the basket of measures, mitigation activities and the assistance needed to implement such measures. The compilation of information contained in States' action plans facilitates the assessment of progress toward the achievement of the ICAO global aspirational goals, and identifies the areas of implementation support needed by States. On 11 January 2018, the Philippines became the 106th Member State to voluntarily submit its action plan to ICAO, bringing the coverage of international aviation Revenue Tonne Kilometres (RTK) to 90.84 per cent.

6.3 A strategy for capacity building on States' action plans was put in place in 2010 and since then ICAO has regularly organized seminars in all ICAO regions to provide States with an overview of ICAO's environment-related activities and to provide additional support to States in developing and enhancing their action plans. Guidance documentation, software tools, an online template, and practical, hands-on assistance to support the development and enhancement of the various elements of the action plans were provided to the national action plan focal points.

6.4 ICAO's activities on technical assistance in the area of environmental protection gained even greater significance with the launch of two capacity-building and assistance projects, in partnership with the European Union (EU), and with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), respectively. Both projects have successfully delivered on a series of outcomes, leading, amongst others, to the submission of quantified State Action Plans by the 14 States selected under the ICAO-EU project and to the development of key guidance material under the ICAO-UNDP-GEF projects. Specifically:

- To assist the efforts of Member States to collect environmental data and monitor their CO₂ emissions from the aviation sector at the national level, and ICAO, with the financial support of the EU, developed a tool titled Aviation Environmental System (AES). The beneficiary States under the ICAO-EU project have all been equipped with the AES, which allows them to collect and analyse environmental data regarding

their aviation activities and to automatically generate CO₂ emissions reports on a monthly and annual basis;

- Under the ICAO-EU project, in cooperation with the United Nations Institute for Training and Research (UNITAR), dedicated training material, consisting of an e-learning course and e-books on States' Action Plans and mitigation measures, were created. The e-learning course was launched in November 2017, and is freely accessible to all States' Action Plan Focal Points;
- The ICAO-UNDP-GEF capacity-building project is reaching its last phase, supporting the implementation of two solar-at-gate pilot projects at two airports in Jamaica. The project delivered all the other components, including a series of guidance material which are accessible from the ICAO website (https://www.icao.int/environmental-protection/Pages/ICAO_UNDP_Guidancedocs.aspx);
- Seminars to disseminate materials developed under the ICAO-UNDP-GEF capacity-building project will be held from 23 to 26 April 2018 in Jamaica and from 23 to 14 May 2018 in Fiji. These Seminars aim to stimulate the future development and subsequent implementation of low emissions aviation initiatives in Small Island Developing States in the Caribbean, and in the Asia and Pacific Regions, respectively.

7. UNFCCC – CLIMATE FINANCE

7.1 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 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).

7.2 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 CO₂ emissions from 2020 at the same level (carbon neutral growth from 2020), and these aspirational goals were affirmed by the 38th (2013) and 39th (2016) Sessions of the ICAO Assembly.

7.3 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 the 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.

7.4 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).

APPENDIX A

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 CO₂ 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 prejudice 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 CO₂ 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 CO₂ emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 entrant¹ 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 CO₂ 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,

¹ 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 CO₂ 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 CO₂ 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;

APPENDIX B

DECLARATION OF THE SECOND CONFERENCE ON AVIATION AND 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 CO₂ 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 CO₂ 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 (CORSA) under paragraph 18 of Assembly Resolution A39-3.

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