



ICAO

ENVIRONMENT

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**Agenda item 8 (e) Methodological issues under the Convention: Emissions from fuel used for  
international aviation and maritime transport**

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

**Executive Summary**

ICAO continues to make significant progress on the development and implementation of a basket of measures to achieve the ICAO global aspirational goals of 2 per cent annual fuel efficiency improvement and carbon neutral growth from 2020 onwards. 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 CO<sub>2</sub> Standard for aeroplanes. Operational improvements also bear a significant CO<sub>2</sub> emissions reduction potential, including through the ICAO's Aviation System Block Upgrades strategy.

Regarding sustainable aviation fuels, the ICAO Conference on Aviation and Alternative Fuels held in Mexico in October 2017 adopted a Declaration on the 2050 ICAO Vision for sustainable aviation fuels, which calls on States, industry and other stakeholders, for a significant proportion of aviation fuels to be substituted with sustainable aviation fuels by 2050. To establish important building blocks for the quantification of the 2050 ICAO Vision, the first ICAO stocktaking seminar was held from 30 April to 1 May 2019 in Montréal, Canada, to facilitate the exchange of information among States and relevant stakeholders.

The implementation of CORSIA is on track. In June 2018, the ICAO Council adopted Standards and Recommended Practices for a robust Monitoring, Reporting and Verification system of CO<sub>2</sub> emissions from international aviation, which became applicable from 1 January 2019. ICAO also makes progress on all CORSIA Implementation Elements, including the determination of eligible emissions units that aeroplane operators can purchase in order to meet their offsetting requirements under CORSIA. To ensure the successful implementation of CORSIA, ICAO also launched the ACT-CORSIA (Assistance, Capacity building and Training) programme, including buddy partnerships, through which donor States provide assistance to recipient States to build their national capacities to implement CORSIA. The CORSIA buddy partnerships are established across ICAO regions, involving more than 15 donor States and 95 recipient States to ensure that all Member States are ready to implement CORSIA.

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 CO<sub>2</sub> emissions from international aviation.

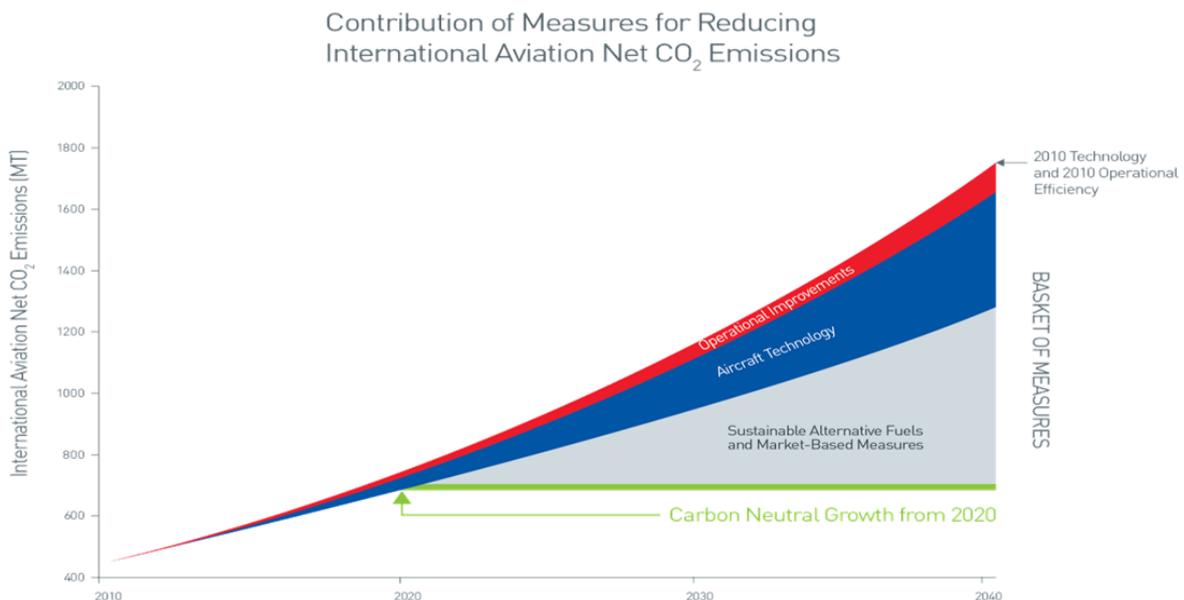
## 1. INTRODUCTION

1.1 The ICAO work in addressing greenhouse gas emissions from international aviation is underpinned by two Resolutions that were adopted during the 39th Session of the ICAO Assembly in October 2016:

- **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 to 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 CO<sub>2</sub> emissions from 2020 at the same level (carbon neutral growth from 2020)**.

1.3 The basket of measures includes aircraft technology, operational improvements, sustainable aviation fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). ICAO has made significant progress in each element of the basket, which is described in the following sections.



## 2. AIRCRAFT TECHNOLOGY

2.1 In March 2017, the **Aeroplane CO<sub>2</sub> emissions Standard** was adopted by the ICAO Council as a **Volume III to Annex 16** to the Convention on International Civil Aviation. This Standard is the first global Standard for CO<sub>2</sub> emissions of any sector. It will apply to new aeroplane type designs from 2020, and to aeroplane type designs 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 new CO<sub>2</sub> 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 the Standard.

2.2 The likelihood of 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 in this area and ICAO will continue to monitor technologies in order to develop relevant Standards and Recommended Practices (SARPs) for these new aircraft, in a timely manner.

### 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 CO<sub>2</sub> emissions reduction, an analysis was undertaken to estimate and inform the global aviation community on the CO<sub>2</sub> reduction benefits from the implementation of the **Aviation System Block Upgrades (ASBUs) Strategy** – Block 0 and Block 1 modules. The analysis shows that current and planned implementation of the B0/B1 ASBU elements will provide a total annual global fuel saving in 2025 of between 167 to 307 kg per flight, which corresponds to a reduction of 26.2 M to 48.2 Mt of CO<sub>2</sub>, or savings of USD 5 to 9.2 billion.

3.2 The first global horizontal flight efficiency analysis was also performed, as a first step toward a complete fuel efficiency analysis. The results were broken down by ICAO regions for 2017 data and showed that efficiency levels vary between 94 and 98 per cent. The conclusions identified limitations to the analysis in order to facilitate the interpretation of the results.

3.3 The first ICAO Seminar on Green Airports was held in November 2017, and facilitated discussions and the exchange of information on best practices on ground handling, land/air-side mobility, renewable energy, community engagement and sustainability reporting. Following the success of the first seminar, a second such event was held in Lima, Peru, from 8 to 9 May 2019, and provided updates and developments on these subjects.

### 4. SUSTAINABLE AVIATION FUELS

4.1 Following the request 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 second ICAO conference on this subject was held, in Mexico City, Mexico 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 called on States, industry and other stakeholders, for a significant proportion of aviation fuels to be substituted with sustainable aviation fuels by 2050. The ICAO Council endorsed the Declaration in March 2018.

4.2 The 2050 ICAO Vision is based on the assumptions of a progressive increased use of sustainable aviation fuels, and that the Vision should be periodically reviewed through a stocktaking process to continuously assess progress on sustainable aviation fuel development and deployment, including through regular workshops and seminars, leading up to the convening of the next ICAO conference, no later than 2025, with a view to updating the Vision to include a quantified proportion of sustainable aviation fuels to be used by 2050. The first ICAO stocktaking seminar was held from 30 April to 1 May 2019 in Montréal, Canada, to facilitate the exchange of information among States and relevant stakeholders, and to establish important building blocks for the quantification of the 2050 ICAO Vision.

4.3 ICAO also keeps track of flights using sustainable aviation fuels and provides various information on recent developments, under the **ICAO Global Framework on Aviation Alternative Fuels (GFAAF)**: <https://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx>. Based on publically-available information from airports and airlines involved in on-going fuel purchase agreements, to date, closer to 200,000 commercial flights have used a blend of alternative fuels.

## 5. CORSIA IMPLEMENTATION

5.1 Through Resolution A39-3, the ICAO Assembly adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as the first global market-based measure (MBM) scheme for any industry sector. The Assembly requested the ICAO Council, with the technical contribution of the Committee on Aviation Environmental Protection (CAEP), to develop SARPs and related guidance material for the implementation of the Monitoring, Reporting and Verification (MRV) system under CORSIA from 1 January 2019. The Assembly also requested the ICAO Council to establish a consolidated central registry under the auspices of ICAO, for operationalization no later than 1 January 2021. The Assembly further requested the ICAO Council to decide on eligible emissions units for use by the CORSIA. In addition, the Assembly requested that ICAO and Member States take necessary action to provide capacity building and assistance, and to build partnerships for CORSIA implementation.

5.2 In November 2016, just after the Assembly, the ICAO Council endorsed the overall plan of preparatory activities for CORSIA implementation, including the development of the CORSIA-related SARPs, as well as the plan for providing capacity building and assistance to Member States. The CORSIA-related SARPs and guidance (also referred to as the “CORSIA package”) comprise three distinct, but interrelated components:

- a) **Annex 16 – Environmental Protection, Volume IV – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)**: provides the required actions by States and aeroplane operators to implement CORSIA;
- b) **Environmental Technical Manual (Doc 9501), Volume IV – Procedures for demonstrating compliance with the CORSIA**: provides guidance on the process to implement CORSIA; and
- c) **Five CORSIA Implementation Elements**, which are reflected in 14 ICAO documents and approved by the ICAO Council prior to their publication. These documents are directly referenced in Annex 16, Volume IV and are essential for the implementation of CORSIA.

5.3 The ICAO Council adopted the **First Edition of Annex 16, Volume IV** in June 2018, which became applicable as of 1 January 2019. The **First Edition of the Environmental Technical Manual (Doc 9501), Volume IV** was issued in August 2018 to make the most recent information available to administrating authorities, aeroplane operators, verification bodies and other interested parties, aiming at achieving the highest degree of harmonisation possible. In addition, ICAO has been making progress on the **five CORSIA Implementation Elements**, as follows:

- a) The **CORSIA States for Chapter 3 State Pairs** is the list of States voluntarily participating in CORSIA offsetting requirements and will be used to define route-based emissions coverage every year from 2021 onwards. Following the notification deadline from States by 30 June 2020, the first edition of this document, to be updated annually, is expected to become available by 1 August 2020. As of May 2019, 80 ICAO Member States have notified ICAO of their intention to voluntarily participate in CORSIA offsetting requirements from 2021, which has increased from 65 States in October 2016;
- b) The **ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT)** aims to simplify the estimation and reporting of CO<sub>2</sub> emissions from international flights for those operators with low levels of activity to fulfil their monitoring and reporting requirements under CORSIA. In June 2018, the ICAO Council approved the 2018 version of the CERT and its technical methodologies. Subsequent versions of the CERT are being developed. The 2019 version, to become available in mid-2019, will

provide necessary output data to be incorporated into the aeroplane operator's annual Emissions Report from 2019. The 2021 version of the CERT will provide additional features to identify those international flights that are subject to the CORSIA offsetting requirements or not, so that the CERT output data will enable an operator to report its annual emissions on the basis of CORSIA route-based coverage;

- c) The ICAO Council has been considering recommendations by the CAEP on **CORSIA Eligible Fuels**. In November 2017, the ICAO Council agreed on two themes of sustainability criteria for CORSIA eligible fuels to be applied during the pilot phase of CORSIA by 2023, and requested CAEP to develop further proposals on strengthened sustainability criteria by the end of 2023. Further recommendations from the CAEP are under consideration by the ICAO Council, including the means to obtain the life-cycle emissions reduction benefits accrued from the use of CORSIA eligible fuels: both “default life-cycle emission values” of fuels produced from various feedstocks and conversion processes; and methodologies for calculating “actual life-cycle emissions values”. Other CAEP recommendations address eligibility framework and requirements for sustainability certification schemes (SCS), as well as a process to evaluate such SCSs in light of the eligibility framework and requirements. The evaluation will result in a list of eligible SCS, for consideration by the ICAO Council in due course;
- d) In 2018, the ICAO Council initiated a process to establish a Technical Advisory Body (TAB) with the objective of making recommendations to the ICAO Council on **CORSIA Eligible Emissions Units** for use under CORSIA. In March 2019, the ICAO Council agreed on a list of 19 TAB members, and approved the Terms of Reference for the TAB. The ICAO Council also approved the Emissions Units Criteria (EUC) to be used by the TAB in undertaking its tasks to assess emissions units programmes. The results of TAB's work and recommendations are expected by March 2020. The EUC as approved by the Council, as well as the membership, TOR and working programme/timeline of the TAB, are available under the ICAO CORSIA website<sup>1</sup>;
- e) The **CORSIA Central Registry (CCR)** is an information management system that will allow the input and storage of CORSIA-relevant information reported by States, as well as calculations and reporting by ICAO, in accordance with Annex 16, Volume IV. In June 2018, the ICAO Council approved the functional requirements for the CCR. The CCR is currently in its development phase, and ICAO aims to have the CCR operationalized in 2020, which is aligned with the timing when States are to submit 2019 CO<sub>2</sub> emissions data to ICAO for the first time.

5.4 In June 2018, the ICAO Council endorsed the **ACT-CORSIA (Assistance, Capacity-building and Training for the CORSIA) programme**, emphasizing the importance of a coordinated approach under ICAO to harmonize and bring together all relevant actions and promote coherence to capacity building efforts related to CORSIA implementation.

5.5 By April 2019, **CORSIA Buddy Partnerships** under ACT-CORSIA have been established, involving more than 15 donor States and 95 recipient States (see Appendix B). Approximately 80 recipient States had received training, while follow-up activities have also been undertaken, regarding the finalization and approval of emissions monitoring plans of their aeroplane operators, and the establishment of appropriate national regulatory frameworks. Weekly updates on buddy partnerships are made available on the ICAO website.

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<sup>1</sup> <https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Emissions-Units.aspx>

5.6 Building upon the successful first phase of buddy partnerships, the Secretariat is facilitating the establishment of the **second phase of CORSIA Buddy Partnerships**, which will focus on upcoming CO<sub>2</sub> reporting and verification requirements under the CORSIA.

5.7 In addition, the Secretariat has continued its public outreach efforts by: providing recent news and developments on the ICAO CORSIA public website ([www.icao.int/corsia](http://www.icao.int/corsia)); updating the Frequently Asked Questions (FAQs), including those related to Annex 16, Volume IV; and updating its outreach materials, including brochures, videos, and leaflets.

5.8 Recognizing the importance of continuing to support States for CORSIA implementation, the ICAO Secretariat organized series of regional seminars and workshops on CORSIA every year. In addition, the ICAO Secretariat has been delivering a training course to national accreditation bodies and verification bodies related to CORSIA verification requirements, with a view to facilitating the availability of accredited verification bodies by the time the operators' Emissions Reports need to be verified in early 2020.

## 6. STATE ACTION PLANS AND ASSISTANCE

6.1 The **State action plans** are a strategic tool, which allow States to lay down a long-term vision for the evolution of international civil aviation CO<sub>2</sub> emissions, in full coordination with their international aviation stakeholders. This cooperation process facilitates the identification of CO<sub>2</sub> mitigation activities and the assistance needed to implement such measures. The compilation of information contained in State action plans facilitates the assessment of progress toward the achievement of the ICAO global aspirational goals, and the areas of implementation support needed by States.

6.2 As of May 2019, **111 Member States** (representing 92.3 per cent of the global international aviation traffic in Revenue Tonne Kilometres (RTK)) have voluntarily submitted their action plans to ICAO.

6.3 A strategy for capacity building on State action plans was put in place since the 2010 Assembly, and since then ICAO has regularly organized seminars in all regions to provide 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 ICAO 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 beneficiary States under the ICAO-EU project and to the development of key guidance material under the ICAO-UNDP-GEF projects. Specifically:

- Under the ICAO-EU project, a tool titled Aviation Environmental System (AES) was developed to assist the efforts of Member States to collect environmental data and monitor their CO<sub>2</sub> emissions from the aviation sector at the national level. The beneficiary States in Africa and the Caribbean regions 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 CO<sub>2</sub> emissions reports on a monthly and annual basis;

- Under the ICAO-EU project, two solar-at-gate pilot projects, consisting of a solar photovoltaic system and gate electrification equipment, are being implemented in Cameroon and Kenya, as part of the mitigation measures to reduce CO<sub>2</sub> emissions from international aviation. The inauguration ceremonies of the solar projects were held on 12 December 2018 in Mombasa, Kenya, and in January 2019, in Douala, Cameroon; and
- The ICAO-UNDP-GEF capacity-building project organized its final seminars to disseminate guidance materials developed under the project, which took place from 23 to 26 April 2018 in Jamaica and from 23 to 14 May 2018 in Fiji. These Seminars aimed to stimulate the future development and subsequent implementation of low emissions aviation initiatives in Small Island Developing States (SIDS) in the Caribbean, and in the Asia and Pacific Regions, respectively. The project also supported the implementation of two solar-at-gate pilot projects at two airports in Jamaica.

## 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 CO<sub>2</sub> 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).

## 8. FUTURE CHALLENGES

8.1 Despite all of these achievements in ICAO on international aviation and climate change, further progress needs to be accomplished through ICAO on new technologies, improved operations and sustainable aviation fuels. Technologies are evolving faster than ever and we need to

be ready on the regulatory side for their certification. Hybrid, electric and new supersonic aircraft are examples of such challenges ahead of us.

8.2 With the intensification of extreme weather events, such as extremely high temperatures, hurricanes, snow and ice storms, aviation needs to be ready and ICAO has a leadership role in supporting all States with adaptation measures. In fact, both mitigation and adaptation are part of what characterizes a “green and resilient airport”, a concept that requires that environmental considerations and the concept of circular economy be encompassed in the planning, management and operation of such facilities.

8.3 2019 is an Assembly year for ICAO, and ICAO views the occasion of its 75th anniversary as an opportunity to highlight the incredible environmental progress it has made and continues to make, and to also showcase that over the coming years, international flights are going to be built on a much greener foundation thanks to the global actions by governments, industry, non-governmental actors and society as a whole.

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## 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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<sub>2</sub> emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sup>2</sup> 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<sub>2</sub> 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,

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<sup>2</sup> 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<sub>2</sub> 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<sub>2</sub> 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**

**CORSIA Buddy Partnerships under the ICAO ACT-CORSIA Programme**

<b>ACT</b>  <b>CORSIA</b> <sup>Phase I</sup> Assistance, Capacity-building and Training on CORSIA	
<b>AUSTRALIA</b>  <ul style="list-style-type: none"> <li>1. BRUNEI DARUSSALAM </li> <li>2. INDONESIA </li> <li>3. NAURU </li> <li>4. PAPUA NEW GUINEA </li> <li>5. SRI LANKA </li> <li>6. THAILAND </li> </ul>	<b>JAPAN</b>  <ul style="list-style-type: none"> <li>1. AFGHANISTAN </li> <li>2. BANGLADESH </li> <li>3. BHUTAN </li> <li>4. CAMBODIA </li> <li>5. MALAYSIA </li> <li>6. MYANMAR </li> </ul>
<b>CANADA / FRANCE</b>  <ul style="list-style-type: none"> <li>1. BURKINA FASO </li> <li>2. CAMEROON </li> <li>3. CHAD </li> <li>4. COMOROS </li> <li>5. CONGO </li> <li>6. COTE D'IVOIRE </li> <li>7. D. R. OF CONGO </li> <li>8. DJIBOUTI </li> <li>9. GABON </li> <li>10. HAITI </li> <li>11. MADAGASCAR </li> <li>12. MALI </li> <li>13. MAURITANIA </li> <li>14. MAURITIUS </li> <li>15. NIGER </li> <li>16. SENEGAL </li> <li>17. TOGO </li> </ul>	<b>KENYA</b>  <ul style="list-style-type: none"> <li>1. RWANDA </li> <li>2. SEYCHELLES </li> <li>3. SOUTH SUDAN </li> <li>4. UGANDA </li> </ul>
	<b>MEXICO / SPAIN / USA</b>  <ul style="list-style-type: none"> <li>1. BELIZE </li> <li>2. COSTA RICA </li> <li>3. EL SALVADOR </li> <li>4. GUATEMALA </li> <li>5. HONDURAS </li> <li>6. NICARAGUA </li> </ul>
	<b>NEW ZEALAND</b>  <ul style="list-style-type: none"> <li>1. FIJI </li> <li>2. SAMOA </li> <li>3. SOLOMON ISLANDS </li> <li>4. VANUATU </li> </ul>
<b>CANADA / FRANCE / SPAIN</b>  <ul style="list-style-type: none"> <li>1. ALGERIA </li> <li>2. EGYPT </li> <li>3. IRAQ </li> <li>4. JORDAN </li> <li>5. MOROCCO </li> <li>6. SAUDI ARABIA </li> <li>7. TUNISIA </li> </ul>	<b>NIGERIA</b>  <ul style="list-style-type: none"> <li>1. GAMBIA </li> <li>2. GHANA </li> <li>3. LIBERIA </li> <li>4. SIERRA LEONE </li> <li>5. SUDAN </li> </ul>
<b>GERMANY</b>  <ul style="list-style-type: none"> <li>1. JAMAICA </li> <li>2. TAJIKISTAN </li> <li>3. TRINIDAD &amp; TOBAGO </li> </ul>	<b>REPUBLIC OF KOREA</b>  <ul style="list-style-type: none"> <li>1. LAO PEOPLE'S D. R. </li> <li>2. MONGOLIA </li> <li>3. PAKISTAN </li> <li>4. PHILIPPINES </li> <li>5. VIETNAM </li> </ul>
<b>GERMANY/ ECAC</b>  <ul style="list-style-type: none"> <li>1. ALBANIA </li> <li>2. ARMENIA </li> <li>3. AZERBAIJAN </li> <li>4. REPUBLIC OF MOLDOVA </li> <li>5. SERBIA </li> <li>6. NORTH MACEDONIA </li> <li>7. TURKEY </li> </ul>	<b>SOUTH AFRICA</b>  <ul style="list-style-type: none"> <li>1. BOTSWANA </li> <li>2. LESOTHO </li> <li>3. MALAWI </li> <li>4. NAMIBIA </li> <li>5. ZAMBIA </li> <li>6. ZIMBABWE </li> </ul>
<b>ITALY</b>  <ul style="list-style-type: none"> <li>1. ANTIGUA AND BARBUDA </li> <li>2. BAHAMAS </li> <li>3. ERITREA </li> <li>4. ETHIOPIA </li> <li>5. GUYANA </li> <li>6. SOMALIA </li> <li>7. SURINAME </li> <li>8. UNITED REPUBLIC OF TANZANIA </li> </ul>	<b>SPAIN</b>  <ul style="list-style-type: none"> <li>1. BOLIVIA </li> <li>2. CUBA </li> <li>3. PERU </li> <li>4. URUGUAY </li> </ul>
<b>ITALY &amp; BRAZIL</b>  <ul style="list-style-type: none"> <li>1. ANGOLA </li> <li>2. CABO VERDE </li> <li>3. COLOMBIA </li> <li>4. MOZAMBIQUE </li> <li>5. PARAGUAY </li> <li>6. SAO TOME AND PRINCIPE </li> </ul>	<b>USA</b>  <ul style="list-style-type: none"> <li>1. ARGENTINA </li> <li>2. DOMINICAN REPUBLIC </li> <li>3. ECUADOR </li> <li>4. PANAMA </li> </ul>
	 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p><b>15 DONOR STATES</b></p> <p><b>98 RECIPIENT STATES</b></p> </div>

**ACT-CORSIA** Phase I **Buddy Partnerships**  
**On-site Training Activities**

**CORSIA**

81 States Trained (as of 30 April 2019)

