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ICAO ENVIRONMENT

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The Fifty-first Session of the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA51)

Madrid, Spain – 2 to 9 December 2019

Agenda item 10 (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

The 40th Session of the ICAO Assembly in October 2019 recognized the substantial progress on environmental protection made by ICAO and its Member States, especially in regards to the achievement of ICAO global aspirational goals of two per cent annual fuel efficiency improvement and carbon neutral growth from 2020 onwards. The Assembly adopted Resolution A40-18 on international aviation and climate change, and Assembly Resolution A40-19 on the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which elaborate work to be accomplished in the next three years. Some States filed reservations to provisions of these two Resolutions.

On climate change, while continuing to make progress on all elements of the ICAO basket of measures (aircraft technology, operational improvements, sustainable aviation fuels and CORSIA), the 40th Session of the ICAO Assembly also requested the prioritization of work on the feasibility of a long-term global aspirational goal for international aviation, with the aim of considering options and an implementation roadmap at the 41st Session of the ICAO Assembly in 2022.

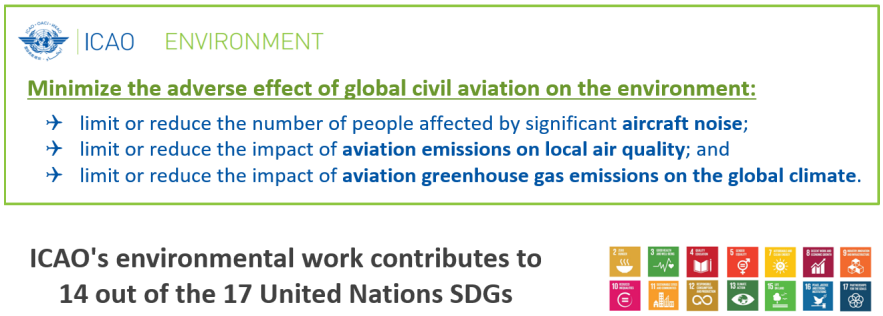
Regarding CORSIA, the 40th Session of the ICAO Assembly recognized the progress achieved in its implementation through the development of ICAO Standards and Recommended Practices (SARPs) and guidance for the CORSIA-related Monitoring, Reporting and Verification (MRV) system, as well as the successful deployment of the ICAO ACT-CORSIA capacity-building programme and the establishment of CORSIA Buddy Partnerships, involving around 120 donor and recipient States to support the full implementation of the robust and global CORSIA MRV system, which started on 1 January 2019.

The Assembly also reaffirmed its support for *"CORSIA as the only global market-based measure applying to CO_2 emissions from international aviation, so as to avoid a possible patchwork of duplicative State or regional measures, thus ensuring that international aviation CO_2 emissions should be accounted for only once"*.

The achievement of the ICAO global aspirational goals requires adequate financial resources within the sector itself, and it is of utmost importance that CORSIA be treated as one element of the basket of mitigation measures to achieve the carbon neutral growth from 2020 onwards. In this regard, the ICAO Assembly requested 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".

1. INTRODUCTION

1.1 Environmental protection is one of five Strategic Objectives of ICAO, and the ICAO's work focuses on three environment objectives of limiting and reducing: the number of people affected by significant aircraft noise; aviation emissions that affect local air quality; and aviation greenhouse gas emissions that affect the global climate. ICAO's environmental work also contributes to 14 out of the 17 UN Sustainable Development Goals (SDGs).



1.2 For the current triennium (2017-2019), the work of ICAO focused on 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_2 emissions from 2020 at the same level (carbon neutral growth from 2020). The basket of measures includes aircraft technology, operational improvements, sustainable aviation fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

1.3 The 40th Session of the ICAO Assembly (24 September to 4 October 2019) took stock of the significant progress made by ICAO and its Member States on each element of the basket of measures and adopted two Resolutions that describe what needs to be accomplished during the next triennium (2020 to 2022) to address the growth of CO_2 emissions from international aviation:

a) Assembly Resolution A40-18: "Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change" (see **Appendix A**); and

b) Assembly Resolution A40-19: "Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)" (see **Appendix B**).

1.4 These two Resolutions were adopted by the ICAO Assembly by majority. Following their adoption, some States[1] filed reservations to provisions of these two Resolutions.

2. ICAO OFFICIAL CO EMISSIONS TRENDS

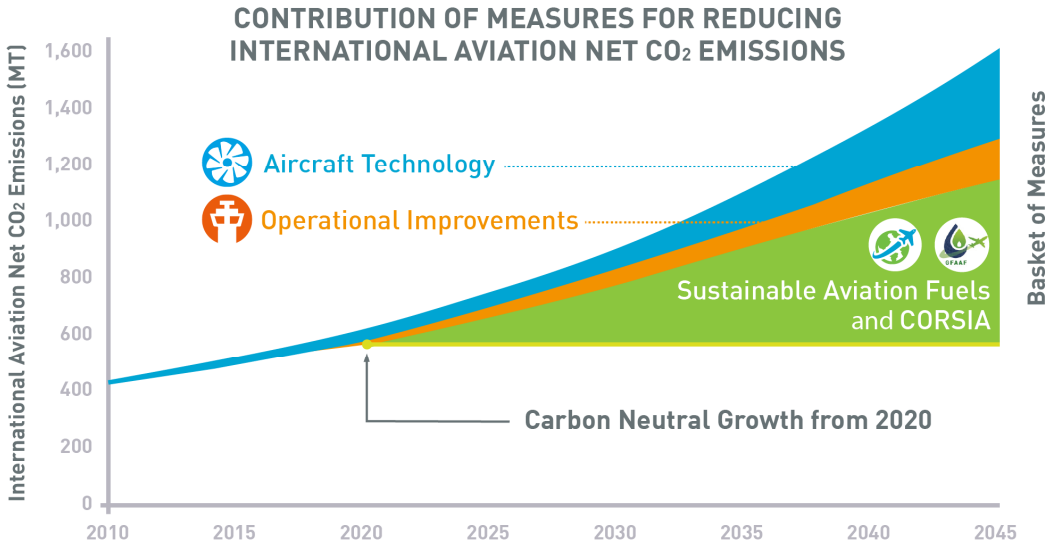
2.1 According to the Intergovernmental Panel on Climate Change (IPCC) Special Report on Aviation and the Atmosphere in 1999 and subsequent IPCC Assessment Reports, aviation (domestic and international) remains to be accounted for approximately 2 per cent of global CO_2 emissions produced by human activity. Approximately 65 per cent of global aviation fuel consumption is from international aviation; applying this share to CO_2 emissions, international aviation is responsible for approximately 1.3 per cent of global man-made CO_2 emissions.

[1] The list of reservations to Assembly Resolutions A40-18 and A40-19 is available on the 40th ICAO Assembly website, upon confirmation by the States: https://www.icao.int/Meetings/a40/Pages/resolutions.aspx

2.2 Due to the need for a robust and single reference for sound discussion and decision-making, since 2004, ICAO has been developing and updating the ICAO global environmental trends for aviation, including global CO_2 emissions trends, which are endorsed at every triennium ICAO Assembly session. In support of this ICAO activity, a significant modelling and analysis exercise has been conducted during each triennium by the ICAO Committee on Aviation Environmental Protection (CAEP), involving professionals from governments, aviation industry, academia and non-governmental organisations around the world, and by using advanced modelling capabilities.

2.3 According to the recent ICAO global CO_2 emissions trends endorsed by the 40th Session of the ICAO Assembly, international civil aviation consumed approximately 160 megatons (Mt) of fuel in 2015, which resulted in about 500 Mt of CO_2 emissions. By 2045, international air traffic (expressed in revenue tonne kilometres) is anticipated to increase by 3.3 times compared to 2015 levels, while fuel consumption is projected to increase by 2.2 to 3.1 times, depending on the aircraft technology and operational improvement scenarios considered.

2.4 Significant uncertainties exist in predicting the contribution of sustainable aviation fuels in the future. However, a number of near-term scenarios indicate that up to 2.6 per cent of fuel consumption could potentially consist of sustainable aviation fuels by 2025. This analysis also considers the long-term availability of sustainable aviation fuels, finding that, by 2050, it would be physically possible to meet 100 per cent of international aviation jet fuel demand with sustainable aviation fuels, corresponding to a 63 per cent reduction in emissions. However, this level of fuel production could only be achieved with extremely large capital investments in sustainable aviation fuel production infrastructure, and substantial policy support. The effort required to reach these production volumes would have to significantly exceed historical precedent for other fuels, such as ethanol and biodiesel for road transportation. It should also be noted that the CO_2 emissions trends did not consider lower carbon aviation fuels, and that further work to consider such fuels will continue.



The above figure illustrates the CO_2 emissions trends from international aviation, with the contributions of various measures for CO_2 emissions reductions, to achieve the carbon neutral growth from 2020.

3. KEY HIGHLIGHTS OF THE 40TH SESSION OF THE ICAO ASSEMBLY

3.1 Regarding climate change, the 40th Session of the ICAO Assembly:

a) endorsed the ICAO global CO_2 emissions trends as the basis for decision-making on environmental matters;

b) recognized the progress achieved in all elements of the basket of measures to reduce CO_2 emissions from international aviation;

c) welcomed the progress achieved under the ICAO State Action Plan initiative noting that 117 States, representing 93.7 per cent of international traffic, have voluntarily submitted their action plans to ICAO;

d) agreed that the Organization should continue to enhance ICAO's capacity building and assistance activities relating to coordinating, facilitating and monitoring actions to reduce international aviation CO_2 emissions;

e) recognized the importance for ICAO to closely follow up environmentally-driven technologies and innovations that may impact the environment, including new energy sources for aviation (e.g. electric aircraft, hybrid aircraft), while maintaining and developing relevant ICAO environmental Standards and guidance, where necessary;

f) encouraged Member States to continue their work on sustainable aviation fuels contributing to the objectives of the 2050 ICAO Vision for Sustainable Aviation Fuels; and

g) requested the prioritization of the work on the feasibility of a long-term global aspirational goal for international aviation CO_2 emissions, with the aim of considering options and an implementation roadmap, at its 41st Session of the ICAO Assembly.

3.2 Regarding CORSIA, the 40th Session of the ICAO Assembly:

a) reaffirmed its support for CORSIA as the only global market-based measure applied to CO_2 emissions from international aviation;

b) recognized the progress achieved in the successful development of CORSIA-related Standards and Recommended Practices (SARPs) and guidance by ICAO, as well as the progress in developing various CORSIA Implementation Elements;

c) recognized the successful implementation of the ICAO ACT-CORSIA programme and the establishment of ACT-CORSIA Buddy Partnerships; and

d) agreed on further work to be accomplished for the full implementation of CORSIA.

4. AIRCRAFT TECHNOLOGY

4.1 In 2017, the new CO_2 emissions Standard was adopted by the ICAO Council as a new Volume III to Annex 16 to the *Convention on International Civil Aviation*. This Standard is the first global Standard for CO_2 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 new CO_2 emissions Standard. In 2028, there is a production cut-off, meaning that in-production aeroplanes that do not meet the standard from 2028 can no longer be produced, unless the designs are modified to meet with the Standard.

4.2 In addition, the likelihood of an electric aircraft entering service has increased over the past 10 years, including all-electric, hybrid-electric, partially turboelectric, and turboelectric aircraft. In relation to new technologies, the ICAO Innovation Fair that took place at ICAO Headquarters in Montréal from 22 to 23 September 2019 [2] had a dedicated session on "Green Innovation" which showcased environment-driven innovative technologies and renewable energy solutions for the sustainable development of civil aviation. The green innovations are important components to explore future emissions reduction opportunities for the international aviation sector, and such potential new partners need to be encouraged to further work together with ICAO Member States.




5. OPERATIONAL IMPROVEMENTS

5.1 Operational improvements in the context of aviation, which would reduce fuel consumptions and thus CO_2 emissions, can be achieved through a broad range of activities including: the efficient flying of aircraft; optimized use of airspace and routes; the advanced control and/or monitoring of aircraft by the air traffic management system; and the conduct of various activities on the ground in airports, such as sing-engine taxing.

5.2 Recognizing that many of the operational improvements defined in the ICAO Global Air Navigation Plan offer the potential to deliver fuel and CO_2 emissions reduction, an analysis of environmental benefits from the implementation of such measures was conducted during the current triennium. Activities in this triennium included the estimation of CO_2 reduction benefits from the implementation of Aviation System Block Upgrades (ASBUs) Strategy – Block 1, which followed a previous environmental assessment of Block 0 modules. The outcome of the ASBU Block 1 analysis further informed the global aviation community on the potential environmental benefits to be accrued from the implementation of Block 1 modules.

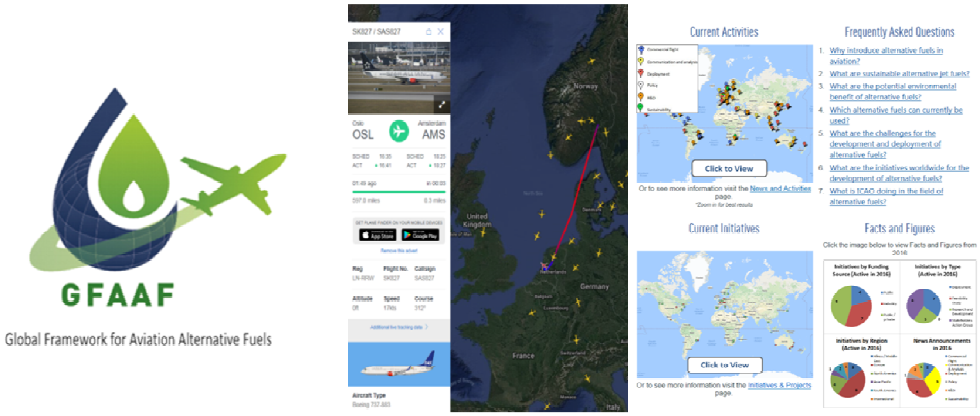
5.3 In addition, ICAO organized Green Airport Seminars to facilitate discussions and encourage the exchange of best practices related to the diverse range of activities for green airports, including smart buildings, renewable energy, green mobility, climate change resilience, and community engagement.

6. SUSTAINABLE AVIATION FUELS

6.1 During the current triennium, ICAO kept track of flights using sustainable aviation fuels and provided various information on recent developments, under the ICAO Global Framework

[2] https://www.icao.int/Meetings/innovation2019/Pages/default.aspx

on Aviation Alternative Fuels (GFAAF)[3]. To date, based on publically-available information from airports and airlines involved in on-going fuel purchase agreements, more than 200,000 commercial flights have used a blend of alternative fuels.



The above figure is various snapshots from ICAO GFAAF, showing an live-information of flights, as well as current initiatives and activities, related to sustainable aviation fuels.

6.2 The 40th Session of the ICAO Assembly requested the ICAO Council to continue to maintaining the ICAO GFAAF and undertake a stocktaking process to continuously assess progress on the development and deployment of sustainable aviation fuels, including regular workshops and seminars, leading up to the convening of the third ICAO conference on this subject no later than 2025, with a view to updating the 2050 ICAO Vision for Sustainable Aviation Fuels (SAF) to include a quantified proportion of SAF to be used by 2050. Information on the ICAO stocktaking process, including the results of first ICAO stocktaking seminar in April 2019, is available on the ICAO website[4] which will be further updated following the second ICAO stocktaking seminar to be held in April 2020. The 40th Session of the ICAO Assembly also highlighted the need for ICAO to provide forum to exchange information and facilitate better understanding of lower carbon aviation fuels.

ICAO Conference on Aviation Alternative Fuels in Mexico City (CAAF/2)
(11 to 13 October 2017) - https://www.icao.int/Meetings/CAAF2/

- Endorsement of the ***2050 ICAO Vision for Sustainable Aviation Fuels***, which called for a ***significant proportion of SAF use by 2050***

- ***A quantified 2050 ICAO Vision*** to be defined at CAAF/3 (by 2025), and ***ICAO Stocktaking process*** will support the quantification of this vision

6.3 In addition, in the context of CORSIA implementation (refer to Section 7 below), ICAO Council recently agreed on globally-harmonized sustainability criteria and the life-cycle emissions reduction values to be applied for sustainable aviation fuels from different feedstock, as well as the eligibility requirements for sustainability certification schemes (SCS). These developments will provide a methodology under CORSIA to reduce an operator's CO_2 offsetting

[3] https://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx
[4] https://www.icao.int/environmental-protection/Pages/SAF_Stocktaking.aspx

requirement through the use of such fuels (see more details in Section 7, *CORSIA Eligible Fuels*, below).

7. CORSIA IMPLEMENTATION

7.1 CORSIA was adopted by Member States at the 39th Session of the ICAO Assembly in 2016, as the first global market-based measure for any industry sector, and the scheme complements a broader basket of measures to achieve carbon neutral growth from 2020 onwards.

7.2 The 40th Session of the ICAO Assembly acknowledged the successful development of CORSIA-related Standards and Recommended Practices (SARPs) – Annex 16, Volume IV, and the Environmental Technical Manual (ETM), Volume IV – *Procedures for demonstrating compliance with the CORSIA*, as well as the progress in developing various CORSIA Implementation Elements. It also recognized that while CORSIA implementation is on track, there is need to further develop and update the CORSIA-related SARPs, guidance and remaining CORSIA Implementation Elements such as CORSIA eligible fuels and CORSIA eligible emissions units.

7.3 The following paragraphs provide more information on ICAO's recent developments and next steps related to CORSIA implementation, while **Appendix C** provides a briefing note to facilitate the background and basic understanding of CORSIA.

Information on the status of CORSIA implementation is available on the ICAO CORSIA website www.icao.int/corisa.

CORSIA Volunteer States

7.4 As of 16 July 2019, 81 States have expressed their intention to voluntarily participate in CORSIA from its outset, and that number increased from 65 States since the CORSIA was agreed at the 39th Assembly in October 2016[5].

CORSIA CO_2 Estimation and Reporting Tool (CERT)

7.5 The ICAO CORSIA CO_2 Estimation and Reporting Tool (CERT) simplifies the estimation and reporting of CO_2 emissions from international flights for aeroplane operators with low levels of activity, and helps these operators fulfil their monitoring and reporting requirements under

[5] https://www.icao.int/environmental-protection/CORSIA/Pages/state-pairs.aspx

CORSIA. The Council, in June 2019, approved the 2019 version of the CORSIA CERT and the supporting technical documentation, for publication on the CORSIA website.

CORSIA Eligible Fuels

7.6 Regarding the work on CORSIA Eligible Fuels, ICAO is making progress to develop a methodology to reduce an operator's CO_2 offsetting requirement through the use of such fuels under CORSIA, including the development of life-cycle emissions values, sustainability criteria, and eligibility requirements for sustainability certification schemes (SCS).

7.7 Following the Council approval in June 2019, ICAO document *CORSIA Sustainability Criteria for CORSIA Eligible* was published on the ICAO website[6]. The following three other ICAO documents related to CORSIA Eligible Fuels were also approved by the Council in November 2019: *CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes*; *CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels*; and *CORSIA Methodology for Calculating Actual Life Cycle Emissions Values*. The fifth ICAO document related to CORSIA Eligible Fuels (*CORSIA Approved Sustainability Certification Schemes*) will be brought for Council's consideration once finalized.

7.8 Further work in ICAO will continue on lower carbon aviation fuel and the development of a full set of sustainability criteria for CORSIA Eligible Fuels.

CORSIA Eligible Emissions Units

7.9 On the subject of CORSIA Eligible Emissions Units, the 40th Session of the ICAO Assembly noted the views and perspectives presented by States on the need for the timely decision by the Council, and the need to recognize the special circumstances of UNFCCC mechanisms, flexibility and broad access for operators to eligible units while ensuring the environmental integrity of CORSIA.

7.10 The Technical Advisory Body (TAB) of the ICAO Council has continued its work on assessing emissions units programmes against the approved emissions unit criteria. Applications were submitted by 14 programmes[7], which are being assessed by the TAB, together with comments received by the public comments period. The first recommendations by the TAB on CORSIA eligible emission units are expected for the consideration by the Council in March 2020.

CORSIA Central Registry (CCR)

7.11 The CORSIA Central Registry (CCR) is an information management system that will assist Member States and ICAO to fulfil the reporting and analytical requirements contained in Annex 16, Volume IV. The CCR will help States to upload and submit CORSIA-related information, and will enable ICAO to store the submitted information, calculate specific parameters and provide relevant data back to States.

7.12 The first version of the CCR was delivered to ICAO in November 2019, and ICAO is performing several system integrity checks to ensure its proper functioning, and deployment of the first version of the CCR to States is expected in early 2020.

CORSIA Verification

[6] https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx
[7] https://www.icao.int/environmental-protection/CORSIA/Pages/TAB.aspx

7.13 As aeroplane operators will report the verified 2019 CO_2 emissions to States for the first time in May 2020, there needs to be enough number of verification bodies to be accredited by National Accreditation Bodies, and to be available for undertaking the verification of 2019 emissions reports for aeroplane operators.

7.14 In early 2019, the ICAO Secretariat developed a three-day CORSIA Verification Course to provide training on how to verify CO_2 Emissions Reports prepared by aeroplane operators, in accordance with Annex 16, Volume IV[8]. The training course is targeted for potential verification bodies, with a view to facilitating more availability and accessibility of accredited verification bodies. Up to the end of September 2019, the course had been successfully delivered in 10 different locations around the world with the participation of 104 experts. 24 verifications bodies are already accredited by eight States. Three more deliveries are scheduled by the end of 2019 and approximately 150 experts will be trained in total, expecting more verifications bodies to be accredited. In cooperation with the International Accreditation Forum (IAF), the course will also be offered to representatives of National Accreditation Bodies.

ACT-CORSIA (Assistance, Capacity-building and Training for the CORSIA)

7.15 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. The ICAO Council also requested that any bilateral or multilateral partnerships among States should be coordinated with ICAO, so that the global progress of such coordinated efforts would be monitored.

Today, ACT-CORSIA became one of the most successful capacity-building programmes for climate change, actively involving more than 120 States, and a live example of the spirit of ICAO's "No Country Left Behind" initiative.

7.16 As part of the ACT-CORSIA programme, the ICAO Council encouraged the establishment of CORSIA Buddy Partnerships among States. Through such partnerships, a donor State is to provide assistance to a recipient State to build its national capacity to implement CORSIA. Typically, the assistance is in the form of a donor State offering expert(s) on CORSIA to provide individual training to and undertake the necessary follow-up with the CORSIA focal points of the recipient States, in close coordination with the ICAO Secretariat. In this regard, the ICAO Secretariat has trained experts from donor States to provide harmonized training to recipient States.

7.17 In 2018, the training focussed on the preparation and implementation of the recipient State's CORSIA Monitoring, Reporting and Verification (MRV) system, and the establishment of a national regulatory framework. The second phase of ACT-CORSIA is under way from 2019, with its focus being on reporting and verification of CO_2 emissions under CORSIA's MRV system. Aeroplane operators will report their CO_2 emissions to State Authorities for the first time in May 2020. With this training, ICAO wants to ensure that all States fully understand and are ready to fulfil their reporting requirements, as well as to gain hands-on knowledge of the CORSIA verification aspects related to them.

[8] https://www.icao.int/training/Pages/CORSIA.aspx

7.18 The CORSIA Buddy Partnerships has been established, involving approximately 120 donor and recipient States in total. The latest developments regarding the ACT-CORSIA Programme are highlighted on the ICAO website[9].

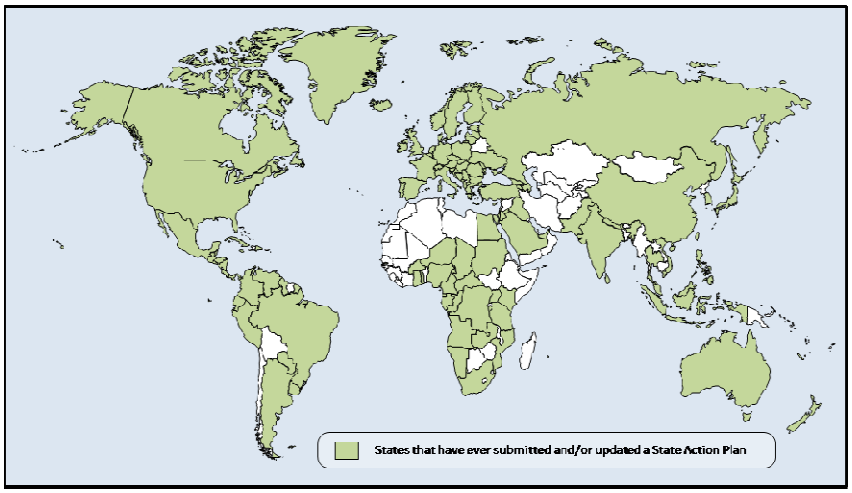
7.19 Recognizing the importance of continuing to support States for CORSIA implementation, the ICAO Secretariat also plans to organize a series of regional seminars from March to April in 2020, which will focus on reporting and verification of CO_2 emissions from international aviation, including hands-on training on the CORSIA Central Registry.

[9] www.icao.int/corsia

8. STATE ACTION PLANS AND ASSISTANCE

8.1 The State Action Plan is a planning and communication tool, which allows a specific ICAO Member State to address international civil aviation CO_2 emissions, in full coordination with their stakeholders. It provides a "big picture" view of which CO_2 mitigation activities are most suitable considering the specific situation of a specific State. It also provides an opportunity to define the assistance needed by the State to implement such measures. The compilation of information contained in submitted State Action Plans facilitates ICAO's assessment of progress toward the achievement of the ICAO global aspirational goals, and the areas of implementation support needed by States. As of 8 November 2019, 117 Member States (representing 93.7 per cent of the global international aviation traffic in Revenue Tonne Kilometres (RTK)) voluntarily submitted their action plans to ICAO, and more action plans are expected to be submitted in 2020.

8.2 The ICAO capacity building and assistance activities related to State Action Plans were originally established at the ICAO Assembly in 2010, and ICAO has regularly organized seminars in all ICAO regions to provide support to States in developing and enhancing their State 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 State Action Plans are all available for the national action plan focal points.



8.3 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 in 2014. Both projects have successfully delivered 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:

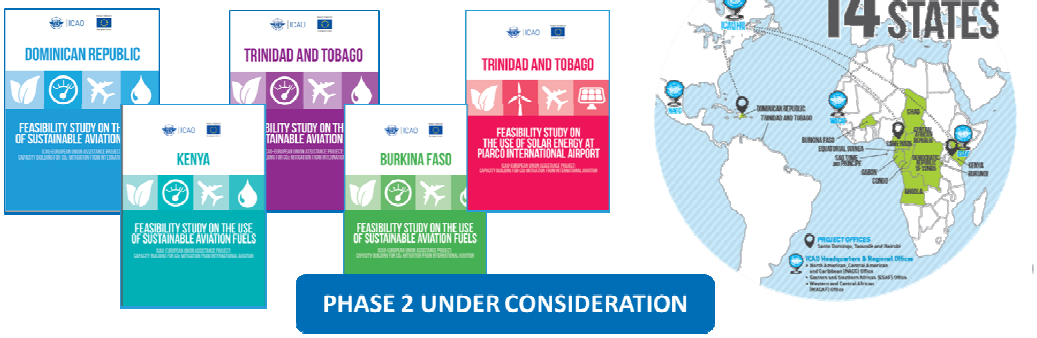
a) under the ICAO-EU project, a tool titled Aviation Environmental System (AES) was developed to assist the efforts of Member States to collect environmental data and monitor their CO_2 emissions from the aviation sector at the national level. The beneficiary States under the ICAO-EU project have all been equipped with the AES, which allows them to collect and analyse environmental data regarding their aviation activities and to automatically generate CO_2 emissions reports on a monthly and annual basis;

b) under the ICAO-EU project, two solar-at-gate pilot projects, consisting of a solar photovoltaic system and gate electrification equipment, were implemented in

Cameroon and Kenya, as part of the mitigation measures to reduce CO_2 emissions from international aviation. The inauguration ceremonies of the solar projects were held in December 2018 in Mombasa, Kenya, and in January 2019, in Douala, Cameroon; and

c) The ICAO-UNDP-GEF capacity-building project was concluded in 2019 with two final seminars to disseminate guidance materials developed under the project. 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.

ICAO – European Union (EU) Assistance Project



ICAO – United Nations Development Programme (UNDP) Assistance Project
(financed by the Global Environment Facility (GEF))

8.4 ICAO is seeking new partnerships to advance the development of more State Action Plans and to implement specific green projects to reduce aviation emissions.

9. UNFCCC – CLIMATE FINANCE

9.1 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).

9.2 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 two per cent per year and keeping its global CO_2 emissions from 2020 at the same level (carbon neutral growth from 2020), and these aspirational goals were affirmed by the 38th (2013), 39th (2016) and 40th (2019) Sessions of the ICAO Assembly.

9.3 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.

9.4 It should also be noted that the 40th Session of the ICAO Assembly determined that the "CORSIA is the only global market-based measure applying to CO_2 emissions from international aviation, so as to avoid a possible patchwork of duplicative State or regional measures, thus ensuring that international aviation CO_2 emissions should be accounted for only once" (Assembly Resolution A40-19, paragraph 18 in **Appendix B**).

9.5 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.

9.6 In this regard, the 40th Session of the ICAO Assembly urged that "ICAO and its Member States express a clear concern, through the UNFCCC process, on the use of internation al 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 A40-18, paragraph 16 in **Appendix A**).

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APPENDIX A

ICAO Assembly Resolution A40-18: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change

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

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

Acknowledging that the work of the Organization on the environment contributes to 14 of the 17 United Nations Sustainable Development Goals (SDGs), including SDG 13 "*Take urgent action to combat climate change and its impacts"*;

Whereas a comprehensive assessment of aviation's impact on the atmosphere is contained in the special report on *Aviation and the Global Atmosphere*, published in 1999, which was prepared at ICAO's request by the Intergovernmental Panel on Climate Change (IPCC);

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

Acknowledging that international aviation emissions, currently accounting for less than 2 per cent of total global CO_2 emissions, are projected to increase as a result of the continued growth of air transport;

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

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

Whereas the Paris Agreement, which was adopted by the Conference of the Parties to the UNFCCC in December 2015, enhances the implementation of the UNFCCC including its objective, and aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

Recognizing the global aspirational goals for the international aviation sector of improving fuel efficiency by 2 per cent per annum and keeping the net carbon emissions from 2020 at the same level, as adopted by the ICAO Assembly at its 37th Session in 2010 and reaffirmed at its 38th and 39th Sessions in 2013 and 2016, as well as the work being undertaken to explore a long-term global aspirational goal for international aviation in light of the 2 °C and 1.5 °C temperature goals of the Paris Agreement;

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

Affirming that addressing GHG emissions from international aviation requires the active engagement and cooperation of States and the industry, and *noting* the collective commitments announced by Airports Council International (ACI), Civil Air Navigation Services Organisation (CANSO), International Air Transport Association (IATA), International Business Aviation Council (IBAC) and International Coordinating Council of Aerospace Industries Associations (ICCAIA) on behalf of the international air transport industry, to continuously improve CO_2 efficiency by an average of 1.5 per cent per annum from 2009 until 2020, to achieve carbon neutral growth from 2020 and to reduce its carbon emissions by 50 per cent by 2050 compared to 2005 levels;

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;

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

Noting that, to promote sustainable growth of international aviation and to achieve its global aspirational goals, a comprehensive approach, consisting of a basket of measures including technology and standards, sustainable aviation fuels, operational improvements and market-based measures to reduce emissions is necessary;

Acknowledging the significant technological progress made in the aviation sector, with aircraft produced today being about 80 per cent more fuel efficient per passenger kilometre than in the 1960's;

Welcoming the adoption of the CO_2 emissions certification Standard for aeroplanes by the Council in March 2017;

Recognizing the work being undertaken to consider the environmental aspects of aircraft end-of-life such as through aircraft recycling;

Recognizing that air traffic management (ATM) measures under the ICAO's Global Air Navigation Plan contribute to enhanced operational efficiency and the reduction of aircraft CO_2 emissions;

Welcoming the assessment of the environmental benefits of the Aviation System Block Upgrades (ASBUs) completed for Block 0 and Block 1, and the results of the first global horizontal flight efficiency analysis;

Welcoming the convening of the ICAO Seminars on Green Airports in November 2017 and May 2019;

Noting that the first Conference on Aviation and Alternative Fuels in November 2009 (CAAF/1) endorsed the use of sustainable aviation fuels, particularly the use of drop-in fuels in the short to mid-term, as an important means of reducing aviation emissions;

Also noting that the CAAF/1 established an ICAO Global Framework for Aviation Alternative Fuels (GFAAF) through which progress has been registered, with six pathways for the certification of sustainable aviation fuels to date, and more airports regularly distributing such fuels;

Further noting that the second Conference on Aviation and Alternative Fuels in October 2017 (CAAF/2) adopted recommendations and approved a declaration, including the 2050 ICAO Vision for Sustainable Aviation Fuels, as a living inspirational path for a significant proportion of aviation fuels to be substituted with sustainable aviation fuels by 2050;

Recognizing that the technological feasibility of drop-in sustainable aviation fuels is proven and that the introduction of appropriate policies and incentives to create a long-term market perspective is required;

Acknowledging the need for such fuels to be developed and deployed in an economically feasible, socially and environmentally acceptable manner and the progress achieved in the harmonization of the approaches to sustainability;

Recognizing that sustainability criteria, sustainability certification, and the assessment of life cycle emissions of such fuels are considered as part of work for the implementation of Carbon Offsetting and Reduction for International Aviation (CORSIA);

Acknowledging the need to explore and facilitate the civil aviation sector's access to renewable energy including through its cooperation with the Sustainable Energy for All (SE4ALL) initiative, as part of the Organization's contribution to SDG 7 "*Ensure access to affordable, reliable, sustainable and modern energy for all"*;

Recalling that Assembly Resolution A37-19 requested the Council, with the support of member States, to undertake work to develop a framework for market-based measures (MBMs) in international aviation, including further elaboration of the guiding principles listed in the Annex to A37-19, and that the guiding principles were elaborated as listed in the Annex to Assembly Resolutions A38-18 and A39-2, which are reproduced in the Annex to this Resolution;

Noting that, consistent with Assembly Resolution A39-2, a substantial strategy for capacity building and other technical and financial assistance was undertaken by the Organization, in line with the No Country Left Behind (NCLB) initiative, to assist the preparation and submission of States' action plans, including the holding of regional seminars, the development and update of ICAO Doc 9988, *Guidance on the development of States' Action Plans on CO_2 Emissions Reduction Activities*, an interactive web-interface, the ICAO Fuel Savings Estimation Tool (IFSET), the ICAO Environmental Benefits Tool (EBT) and a Marginal Abatement Cost (MAC) curve tool;

Welcoming that, as of June 2019, 114 member States that represent more than 93 per cent of global international air traffic voluntarily prepared and submitted action plans to ICAO;

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

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

Recognizing the assistance provided by ICAO in partnership with other organizations to facilitate Member States' action to reduce aviation emissions, as well as continuous search for potential assistance partnerships with other organizations;

Recognizing the importance of work being undertaken to identify the potential impacts of climate change on international aviation operations and related infrastructure; and

Recognizing the progress made by ICAO in its implementation of the Climate Neutral UN initiative and the significant support provided by ICAO to the initiative, in particular through the development of the ICAO Carbon Emissions Calculator, to support the assessment of emissions from passengers travelling by air and welcoming its expansion to add air cargo emissions;

The Assembly:

1. *Resolves* that this Resolution, together with Resolution A40-17: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality* and Resolution A40-19: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, supersede Resolutions A39-1, A39-2 and A39-3 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;

2. *Requests* the Council to:

   a) ensure that ICAO exercise continuous leadership on environmental issues relating to international civil aviation, including GHG emissions;

   b) continue to study policy options to limit or reduce the environmental impact of aircraft engine emissions and to develop concrete proposals, encompassing technical solutions and market-based measures, and taking into account potential implications of such measures for developing as well as developed countries; and

   c) continue to cooperate with organizations involved in policy-making in this field, notably with the Conference of the Parties to the UNFCCC;

3. *Reiterates* that:

   a) ICAO should continue to take initiatives to promote information on scientific understanding of aviation's impact and action undertaken to address aviation emissions and continue to provide the forum to facilitate discussions on solutions to address aviation emissions; and

   b) emphasis should be on those policy options that will reduce aircraft engine emissions without negatively impacting the growth of air transport especially in developing economies;

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

5. *Agrees* that the goals mentioned in paragraph 4 above would not attribute specific obligations to individual States, and the different circumstances, respective capabilities and contribution of developing and developed States to the concentration of aviation GHG emissions in the atmosphere will determine how each State may voluntarily contribute to achieving the global aspirational goals;

6. *Also resolves* that, without any attribution of specific obligations to individual States, ICAO and its Member States with relevant organizations will work together to strive to achieve a collective medium-term global aspirational goal of keeping the global net carbon emissions from international

aviation from 2020 at the same level, taking into account: the special circumstances and respective capabilities of States, in particular developing countries; the maturity of aviation markets; the sustainable growth of the international aviation industry; and that emissions may increase due to the expected growth in international air traffic until lower emitting technologies and fuels and other mitigating measures are developed and deployed;

7. *Recognizes* the many actions that ICAO Member States have taken and intend to take in support of the achievement of the collective aspirational goals, including air traffic management modernization, acceleration of the use of fuel-efficient aircraft technologies, and the development and deployment of sustainable aviation fuels, and *encourages* further such efforts;

8. *Agrees* to review, at its 41st Session, the goal outlined in paragraph 6 above in light of progress towards the goal, studies regarding the feasibility of achieving the goal, and relevant information from States;

9. *Requests* the Council to continue to explore the feasibility of a long-term global aspirational goal for international aviation, through conducting detailed studies assessing the attainability and impacts of any goals proposed, including the impact on growth as well as costs in all countries, especially developing countries, for the progress of the work to be presented to the 41st Session of the ICAO Assembly. Assessment of long-term goals should include information from Member States on their experiences working towards the medium term goal;

10. *Further encourages* States to submit voluntary action plans outlining respective policies and actions, and annual reporting on international aviation CO_2 emissions to ICAO;

11. *Invites* those States that choose to prepare or update action plans to submit them to ICAO as soon as possible preferably by the end of June 2021 and once every three years thereafter, in order that ICAO can continue to compile the quantified information in relation to achieving the global aspirational goals, and the action plans should include information on the basket of measures considered by States, reflecting respective national capacities and circumstances, quantified information on the expected environmental benefits from the implementation of the measures chosen from the basket, and information on any specific assistance needs;

12. *Encourages* States that have already submitted action plans to share information contained in action plans and build partnerships with other Member States in order to support those States that have not prepared action plans, and to make the submitted action plans available to the public, taking into account the commercial sensitivity of information contained in States' action plans;

13. *Requests* the Council to facilitate the dissemination of economic and technical studies and best practices related to aspirational goals and to continue to provide guidance and other technical assistance for the preparation and update of States' action plans prior to the end of June 2021, in order for States to conduct necessary studies and to voluntarily submit action plans to ICAO;

14. *Requests* the Council to maintain and enhance appropriate standard, methodologies and a mechanism to measure/estimate, monitor and verify global GHG emissions from international aviation, and States support the work of ICAO on measuring progress through the reporting of annual data on traffic, fuel consumption and CO_2 emissions;

15. *Requests* the Council to request States to continue to support the efforts of ICAO on enhancing the reliability of measuring/estimating global GHG emissions from international aviation, and to regularly report CO_2 emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementation actions in the sector based on information approved by its Member States;

16. While recognizing that no effort should be spared to obtain means to support the reduction and stabilization of CO_2 emissions from all sources, *urges* 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;

17. *Requests* the Council to:

a) continue to play a pivotal role in providing assistance to its Member States through the dissemination of the latest information on best practices and the provision of guidance and other technical assistance to enhance capacity building and technology transfer, including through the ICAO Technical Cooperation Programme;

b) build further partnerships with other international organizations to meet the assistance needs of ICAO's Member States, including through the ICAO Action Plan Buddy Programme, and facilitate access to existing and new financial resources, technology transfer and capacity building, to developing countries and report on results achieved as well as further recommendations, preliminarily by the end of 2021 and at the 41st Session of the Assembly; and

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

18. *Requests* States to promote scientific research aimed at continuing to address the uncertainties identified in the IPCC special report on Aviation and the Global Atmosphere and in the Assessment reports, and ensure that future assessments undertaken by IPCC and other relevant United Nations bodies include updated information, if any, on aircraft-induced effects on the atmosphere;

19. *Requests* the Council to:

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

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

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

d) assist Member States with studies, evaluations and development of procedures, in collaboration with other States in the region, to limit or reduce GHG emissions on a global basis and work together collaboratively to optimize the environmental benefits that can be achieved through various programmes;

20. *Requests* States to:

a) consider policies to encourage the introduction of more fuel efficient aircraft into the market, and work together through ICAO to exchange information and develop guidance for best practices on aircraft end-of-life such as through aircraft recycling; and

b) accelerate investments on research and development to bring to market more efficient technology;

21. *Requests* the Council to:

a) update the CO_2 emissions certification Standard for aeroplanes, as appropriate; and

b) update medium- and long-term technological goals for aircraft fuel burn;

22. *Requests* States to:

a) accelerate the development and implementation of fuel efficient routings and air navigation procedures to reduce aviation emissions, and work with ICAO to bring the environmental benefits to all regions and States, taking into account the Aviation System Block Upgrades (ASBUs) strategy;

b) reduce legal, security, economic and other institutional barriers to enable implementation of the new air traffic management operating concepts for the environmentally efficient use of airspace; and

c) work together through ICAO to exchange information and best practices on Green Airports;

23. *Requests* the Council to:

a) maintain and update guidance on operational measures to reduce international aviation emissions, and place emphasis on increasing fuel efficiency in all aspects of the ICAO's Global Air Navigation Plan (GANP); encourage States and stakeholders to develop air traffic management that optimizes environmental benefits;

b) continue to develop and update the necessary tools and guidance to assess the benefits associated with air traffic management improvements, and assess the environmental benefits associated with the implementation of the Aviation System Block Upgrades (ASBUs) strategy;

c) continue to provide the forum to exchange information on best practices for Green Airports, covering such subjects as smart buildings, renewable energy, green mobility, climate change resilience, community engagement and sustainability reporting, aiming at sharing lessons learned and best practices amongst airports; and

d) publish and maintain guidance material on the implementation of environmentally sustainable practices at airports, including the publication of the remaining parts of the Eco-Airport Toolkit e-collection;

24. *Requests* States to:

a) set a coordinated approach in national administrations for policy actions and investment to accelerate the appropriate development, deployment and use of clean and renewable energy sources for aviation, including the use of sustainable aviation fuels, in accordance with their national circumstances;

b) consider the use of incentives to encourage the deployment of clean and renewable energies sources for aviation, including sustainable aviation fuels;

c) consider measures to support research and development as well as processing technology and feedstock production in order to decrease costs and support scale-up of sustainable production pathways up to commercial scale, taking into account the sustainable development of States;

d) recognize existing approaches to assess the sustainability of all fuels in general, including those for use in aviation which should achieve net GHG emissions reduction on a life cycle basis, contribute to local social and economic development; competition with food and water should be avoided; and

e) adopt measures to ensure the sustainability of aviation fuels, building on existing approaches or combination of approaches, and monitor their production at a national level;

25. *Requests* the Council to:

a) encourage Member States and invite industry, financial institutions and other international organizations to actively participate in exchange of information and best practices, and facilitate the establishment of partnerships and the definition of policies that will further promote the transition to clean, renewable sources of energy for aviation, including sustainable aviation fuels, through regional seminars;

b) continue to maintain the ICAO Global Framework for Aviation Alternative Fuels (GFAAF);

c) continue to give a global view of the future use of sustainable aviation fuels and to account for changes in life cycle GHG emissions in order to assess progress toward achieving global aspirational goals;

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

e) cooperate with other relevant international initiatives, including the Sustainable Energy for All (SE4ALL) initiative, to facilitate the aviation's access to renewable energy; and

f) continue to undertake a stocktaking process to continuously assess progress on the development and deployment of sustainable aviation fuels, including regular workshops and seminars, leading up to the convening of the CAAF/3 no later than 2025, with a view to updating the 2050 ICAO Vision for Sustainable Aviation Fuels to include a quantified proportion of SAF to be used by 2050;

26. *Requests* the Council to identify the potential impacts of climate change on international aviation operations and related infrastructure, identify adaptation measures to address the potential climate change impacts and develop guidance on climate change risk assessment for international aviation, in cooperation with other relevant international organizations and the industry; and

27. *Requests* the Council to continue to cooperate with the Climate Neutral UN initiative, remain at the forefront of developing methods and tools for quantifying aviation's GHG emissions with respect to the initiative, including the ICAO Carbon Emissions Calculator that also incorporates cargo emissions, and further develop and implement the strategy for reducing GHG emissions and enhancing in-house sustainability management practices of the Organization.

Annex

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

a) MBMs should support sustainable development of the international aviation sector;

b) MBMs should support the mitigation of GHG emissions from international aviation;

c) MBMs should contribute towards achieving global aspirational goals;

d) MBMs should be transparent and administratively simple;

e) MBMs should be cost-effective;

f) MBMs should not be duplicative and international aviation CO_2 emissions should be accounted for only once;

g) MBMs should minimize carbon leakage and market distortions;

h) MBMs should ensure the fair treatment of the international aviation sector in relation to other sectors;

i) MBMs should recognize past and future achievements and investments in aviation fuel efficiency and in other measures to reduce aviation emissions;

j) MBMs should not impose inappropriate economic burden on international aviation;

k) MBMs should facilitate appropriate access to all carbon markets;

l) MBMs should be assessed in relation to various measures on the basis of performance measured in terms of CO_2 emissions reductions or avoidance, where appropriate;

m) MBMs should include *de minimis* provisions;

n) where revenues are generated from MBMs, it is strongly recommended that they should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions, including mitigation and adaptation, as well as assistance to and support for developing States;

o) where emissions reductions are achieved through MBMs, they should be identified in States' emissions reporting; and

p) MBMs should take into account the principle of common but differentiated responsibilities and respective capabilities, the special circumstances and respective capabilities, and the principle of non-discrimination and equal and fair opportunities.

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Note: Resolution A40-18 above was adopted by the 40th Session of the ICAO Assembly by majority. Following its adoption, some States filed reservations to provisions to Resolution A40-18. The list of reservations to Resolution A40-18 is available on the 40th ICAO Assembly website, upon confirmation by the States: https://www.icao.int/Meetings/a40/Pages/resolutions.aspx.

APPENDIX B

ICAO Assembly Resolution A40-19: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

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 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 aviation fuels to achieve ICAO's global aspirational goals;

Whereas Assembly Resolution A39-3 decided to implement a GMBM scheme in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as part of a basket of measures which also include aircraft technologies, operational improvements and sustainable aviation 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 Advisory Group on CORSIA (AGC), its Technical Advisory Body (TAB) and its Committee on Aviation Environmental Protection (CAEP) to support the implementation of CORSIA;

Welcoming the adoption of the first edition of Annex 16 – *Environmental Protection*, Volume IV – *CORSIA*, the provisions of which include Monitoring, Reporting and Verification (MRV) procedures for CORSIA;

Also welcoming the publication of the first edition of *Environmental Technical Manual* (ETM, Doc 9501), Volume IV – *Procedures for demonstrating compliance with the CORSIA*;

Welcoming the progress made for the development of ICAO CORSIA Implementation Elements, which are reflected in 14 ICAO documents directly referenced in Annex 16, Volume IV, containing materials that are approved by the Council, and are essential for the implementation of CORSIA;

Also welcoming the establishment by the Council of the Technical Advisory Body (TAB), with the mandate to make recommendations to the Council on the CORSIA eligible emissions units;

Recognizing the importance of a coordinated approach for capacity building activities by ICAO and its Member States, in cooperation with the aviation industry, to support the implementation of CORSIA, in particular through the ICAO Assistance, Capacity-building and Training for CORSIA (ACT-CORSIA) programme that includes the organization of seminars, development of outreach materials, and establishment of CORSIA partnerships among States;

Welcoming the increasing number of announcements by Member States of their intention to voluntarily participate in CORSIA in the pilot phase from 2021;

Recognizing that strong capacity-building activities can facilitate the decision of Member States to voluntarily participate in CORSIA;

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

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

Emphasizing that the decision by the 39th Session of the Assembly to implement the CORSIA 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 United Nations Framework Convention on Climate Change (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;

Recognizing that the work related to CORSIA and its implementation will contribute to the achievement of the goals set out in the Paris Agreement adopted under the UNFCCC;

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 UNFCCC and ICAO on the development of CDM methodologies for aviation;

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

The Assembly:

1. *Resolves* that this Resolution, together with Resolution A40-17: *Consolidated statement of continuing ICAO policies and practices related to environmental protection - General provisions, noise and local air quality* and Resolution A40-18: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change*, supersede Resolutions A39-1, A39-2 and A39-3 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;

2. *Acknowledges* the progress achieved on all elements of the basket of measures available to address CO_2 emissions from international aviation, including aircraft technologies, operational improvements, sustainable aviation fuels and CORSIA, and *affirms* the preference for the use of aircraft technologies, operational improvements and sustainable aviation 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 aviation fuels may not deliver sufficient CO_2 emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO_2 emissions from international aviation from 2020 at the same level;

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

5. *Recalls* its decision at the 39th Session to implement a GMBM scheme in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to address any annual increase in total CO_2 emissions from international civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country) above the 2020 levels, taking into account special circumstances and respective capabilities;

6. *Requests* the Council to continue to ensure all efforts to make further progress on aircraft technologies, operational improvements and sustainable aviation fuels be taken by Member States and reflected in their action plans to address CO_2 emissions from international aviation, and to monitor and report the progress on implementation of action plans, and that a methodology should be developed to ensure that an aeroplane operator's offsetting requirements under the scheme in a given year can be reduced through the use of CORSIA eligible fuels (i.e., CORSIA sustainable aviation fuels and CORSIA lower carbon aviation 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. *Recalls* its decision at the 39th Session on 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 aeroplane 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. *Recalls* its decision at the 39th Session that the CORSIA shall apply to all aeroplane 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. *Recalls* its decision at the 39th Session that the amount of CO_2 emissions required to be offset by an aeroplane operator in a given year from 2021 is calculated every year as follows:

a) an aeroplane operator's offset requirement = [% Sectoral × (an aeroplane operator's emissions covered by CORSIA in a given year × the sector's growth factor in the given year)] + [% Individual × (an aeroplane operator's emissions covered by CORSIA in a given year × that aeroplane 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 aeroplane operator's growth factor = (the aeroplane operator's emissions covered by CORSIA in the given year – average of the aeroplane operator's emissions covered by CORSIA between 2019 and 2020) / the aeroplane operator's 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 aeroplane operator's emissions covered by CORSIA in a given year, as stated above, or

b) an aeroplane 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 aeroplane 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. *Recalls* its decision at the 39th Session that a new entrant[10] 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 aeroplane operators;

13. *Recalls* its decision at the 39th Session 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: aeroplane operators emitting less than 10,000 metric tonnes of CO_2 emissions from international aviation per year; aeroplane with less than 5,700 kg of Maximum Take Off Mass (MTOM); or humanitarian, medical and firefighting operations;

14. *Recalls* its decision at the 39th Session 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 aeroplane operators included in the scheme;

15. *Recalls* its decision at the 39th Session on a three year compliance cycle, starting with the first cycle from 2021 to 2023, for aeroplane operators to reconcile their offsetting requirements under the scheme, while they report the required data to the authority designated by the aeroplane operator's State of registry every year;

16. *Recalls* its decision at the 39th Session on the need to provide for safeguards in the CORSIA to ensure the sustainable development of the international aviation sector and against inappropriate

[10] A new entrant is defined as any aeroplane operator that commences an aviation activity falling within the scope of Annex 16, Volume IV 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 aeroplane operator.

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;

17. *Recalls* its decision at the 39th Session that a periodic review of the CORSIA is undertaken by the Council, with the technical contribution of CAEP, 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 aeroplane 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, 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 aviation fuels towards achieving the ICAO's environmental objectives;

18. *Determines* that the CORSIA is the only global market-based measure applying to CO_2 emissions from international aviation so as to avoid a possible patchwork of duplicative State or regional MBMs, thus ensuring that international aviation CO_2 emissions should be accounted for only once;

19. *Requests* the following actions be taken for implementation of the CORSIA:

a) the Council, with the technical contribution of CAEP, to update the Annex 16, Volume IV and Environmental Technical Manual, Volume IV, as appropriate;

b) the Council, with the technical contribution of CAEP, to continue to develop and update the ICAO CORSIA documents referenced in Annex 16, Volume IV related to: ICAO CORSIA CO_2 Estimation and Reporting Tool; CORSIA eligible fuels; CORSIA emissions units criteria (EUC); and CORSIA Central Registry, as appropriate;

c) the Council to develop and update the ICAO CORSIA document referenced in Annex 16, Volume IV related to the eligible emissions units for use by the CORSIA, considering the recommendations of the TAB;

d) the Council to establish, by early 2020, and maintain the CORSIA Central Registry under the auspices of ICAO to enable the reporting of relevant information from Member States to ICAO;

e) the Council to continue to oversee the implementation of the CORSIA, with support provided by the AGC and CAEP, as appropriate; and

f) Member States to take the necessary action to ensure that national policies and regulatory frameworks are established for the compliance and enforcement of the CORSIA, in accordance with the timeline set forth by Annex 16, Volume IV;

20. *Recalls* its decision at the 39th Session 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 TAB and CAEP, including on avoiding double counting and on eligible vintage and timeframe;

21. *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, in accordance with the timeline set forth in Annex 16, Volume IV, including through the ICAO Assistance, Capacity-building and Training for CORSIA (ACT-CORSIA) programme that includes the organization of seminars, development of outreach materials, and establishment of CORSIA partnerships among States, while emphasizing the importance of a coordinated approach under the umbrella of ICAO for undertaking capacity building and assistance activities;

22. *Recalls* its decision at the 39th Session that the CORSIA will use emissions units that meet the Emissions Unit Criteria (EUC) in paragraph 19 above;

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

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

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Note: Resolution A40-19 above was adopted by the 40th Session of the ICAO Assembly by majority. Following its adoption, some States filed reservations to provisions to Resolution A40-19. The list of reservations to Resolution A40-19 is available on the 40th ICAO Assembly website, upon confirmation by the States: https://www.icao.int/Meetings/a40/Pages/resolutions.aspx.

APPENDIX C

Briefing Note on
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was adopted by Member States at the 39th Session of the ICAO Assembly in 2016, as the first global market-based measure for any industry sector. The role of CORSIA is to complement other elements in ICAO basket of measures (aircraft technology, operational improvements and sustainable aviation fuels) to achieve the carbon neutral growth from 2020. CORSIA relies on the use of emissions units from carbon markets to offset the amount of CO_2 emissions that cannot be reduced through the use of other elements in ICAO basket of measures (see Assembly Resolution A40-19, paragraphs 2 to 7).

The following are the frequently-asked questions related to CORSIA.

1) <u>Why a global offsetting scheme ?</u>

a. CORSIA was agreed by ICAO Member States as a global solution for international aviation to achieve the carbon neutral growth from 2020. In the absence of CORSIA, States could have developed separate market-based or economic instruments (taxes, emissions trading, etc.), leading to a patchwork of different national or regional measures at a higher administrative complexity and cost for airlines, or no certainty on CO_2 reduction.

b. During the course of discussions under the ICAO process, Member States considered various options for a global marketed-based measure, such as a global tax, global emissions trading and global carbon offsetting, and a global carbon offsetting scheme was chosen as it would be simpler and more cost effective than other options, and CO_2 reductions could be monitored, reported and verified in a globally harmonized way.

c. The recent 40th ICAO Assembly in October 2019 confirmed that CORSIA is the only global market-based measure applying to CO_2 emissions from international aviation so as to avoid a possible patchwork of duplicative State or regional measures, thus ensuring that international aviation CO_2 emissions should be accounted for only once. *(A40-19, para 18)*.

2) <u>How does CORSIA take into account special circumstances and respective capabilities of ICAO Member States ?</u>

a. To address special circumstances and respective capabilities of ICAO Member States through specific means and concrete approaches that would fit for purpose to the international aviation sector, ICAO agreed on the various key design features of CORSIA, including:

i. State's participation in CORSIA, following a phased-in approach, which starts with a voluntary phase (from 2021) and transitions to the second phase (from 2027 to 2035), with exemptions to LDC, SIDS and LLDCs unless they volunteer to participate in CORSIA *(A40-19, para 9)*;

ii. Route-based approach, by which only international flights between participating States are subject to CORSIA offsetting requirements, in order to make sure the non-discriminatory treatment of all airlines flying on the same international air routes, and thus minimize market distortions between airlines *(A40-19, para 10); and*

iii. Sectoral approach, by which the amount of CO_2 offsetting requirements for individual airlines is calculated on the basis of using the international aviation sector's global emissions growth. It means that fast-growing aviation markets are relatively less

burdened compared to more mature markets by the CORSIA CO_2 offsetting requirements *(A40-19, para 11)*.

b. The Assembly also agreed that ICAO and Member States take all necessary actions in providing capacity building and assistance to ensure the timely implementation of CORSIA *(A40-19, para 19, and see also Question 7 below)*.

3) How were ICAO Member States consulted – Global Aviation Dialogues (GLADs) ?

a. Consideration of CORSIA under the ICAO process had greatly benefited from the full engagement of Member States, aviation industry and other stakeholders, through the organization of two rounds of Global Aviation Dialogues (GLADs), which allowed for the widest possible range of inputs to the process.

b. The first round of five GLADs was organized throughout April 2015 across different ICAO regions in Egypt, Kenya, Peru, Singapore and Spain, with 362 participants from States and international organizations. The second round of GLADs was organized in March/April 2016 in Egypt, Indonesia, Mexico, the Netherlands and Senegal, with 390 participants in total.

c. The GLADs provided a forum for information sharing and exchange of ideas, rather than a forum for decision-making. The main objective of the GLADs was to reach out to those States that were not directly engaged in the ICAO Council or ICAO Committee on Aviation Environmental Protection (CAEP). Thus, the GLADs allowed for well-informed deliberations in the ICAO process, leading to the CORSIA agreement at the 39th session of the ICAO Assembly in October 2016.

4) What is the CORSIA cost ?

a. According to the technical assessment by ICAO Committee on Aviation Environmental Protection (CAEP), the vast majority (98%) of the total cost resulting from the CORSIA is the "compliance cost" for CORSIA offsetting requirements. It refers to the cost incurred by airlines for the purchase of carbon credits that are equivalent to offsetting CO_2 emissions. It is estimated that approximately 2.5 billion tonnes of CO_2 would need to be compensated from 2021 to 2035 (15 years) under CORSIA.

b. Putting the compliance cost into a business perspective, the offsetting cost for airlines represents a small fraction (approximately 1%) of total revenue for the aviation industry.

c. The remaining 2% of the total cost is the "administrative cost" of the CORSIA Monitoring, Reporting and Verification (MRV) system, which are borne by airlines (1.4%) and Member States (0.5%) and ICAO (0.02%). The MRV cost applies to all ICAO Member States that have airlines with international flights. Again, the MRV cost is 2% of the total CORSIA cost, and the total CORSIA cost represents approximately 1% of the total industry revenue.

5) What is the CORSIA MRV system ?

a. The CORSIA approach is based on comparing the total CO_2 emissions from international aviation for a year (from 2021 onwards) against a baseline level of CO_2 emissions, which is defined as the average of the years 2019 and 2020. Any international aviation CO_2 emissions covered by the CORSIA that exceed the baseline level will represent the sector's offsetting requirements for that year.

b. Therefore, regardless of the State's decision to voluntarily participate in CORSIA, all States and aeroplane operators that undertake international flights need to implement a Monitoring, Reporting and Verification (MRV) system for CO_2 emissions from

international flights starting from 1 January 2019. The verified CO_2 data reported from operators to States, and from States to ICAO, are used for the calculation of the CORSIA's baseline, as well as for the calculating airline's offsetting requirements, where applicable.

c. Following the CORSIA agreement in 2016, the ICAO Standards and Recommended Practices (SARPs) for the implementation of CORSIA were developed and adopted in June 2018, as Annex 16, Volume IV to the Convention on International Civil Aviation. The CORSIA SARPs established a robust and global MRV system for international aviation CO_2 emissions and for the cancellation of emissions units under CORSIA.

d. To operationalize the CORSIA and its MRV system, other components were developed, such as the ICAO CORSIA CO_2 Estimation and Reporting Tool (CERT) to simplify the MRV procedures for smaller airlines, which is available on ICAO CORSIA website for free of charge. The CORSIA Central Registry will also be available in early 2020 to allow the input and storage of information reported by States.

6) What are emissions units to be used in CORSIA ?

a. According to Resolution A40-19, paragraph 19 c), ICAO Council will determine eligible emissions units that airlines can use to meet the CORSIA CO_2 offsetting requirements.

b. In this regard, the ICAO Council in March 2019 established the Technical Advisory Body (TAB), which is a group of experts to assess emissions units programmes in light of the Council-approved Emissions Unit Criteria (EUC) and to make recommendations to the Council. Applications were submitted by 14 programmes, which are being assessed by the TAB. The first recommendations by the TAB on CORSIA eligible emission units are expected for the consideration by the Council in March 2020.

7) Is the CORSIA implementation on-track ?

a. In order to provide capacity building and assistance and to ensure the implementation of CORSIA and Annex 16, Volume IV by all Member States, ICAO launched the ACT-CORSIA (Assistance Capacity-building and Training for CORSIA) programme in July 2018, including the establishment of CORSIA buddy partnerships. These buddy partnerships involve experts from donor States who provide support to recipient States for implementation of CORSIA MRV system (currently involving 16 donor States and 109 recipient States, as of the end of 2019).

b. The ICAO ACT-CORSIA programme also includes the organization of ICAO seminars in all regions, and development of outreach materials such as CORSIA-related videos, on-line tutorials, brochures and leaflets, and Frequently Asked Questions (FAQs) to facilitate the understanding and implementation of CORSIA. All information is available on the ICAO CORSIA website: www.icao.int/corsia.

c. With the development of internationally-harmonized ICAO policies, standards, guidance and tools, as well as the robust capacity building and assistance activities for Member States in line with the ICAO's "No Country Left Behind" initiative, the CORSIA implementation is on track.

— END —