



ICAO

ENVIRONMENT

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**Provisional Agenda item 12 (b): Methodological issues under the Convention: Emissions from
fuel used for international aviation and maritime transport**

Submission by the International Civil Aviation Organization (ICAO)

Executive Summary

ICAO continues to lead the global efforts to address international aviation and climate change. Close cooperation amongst Member States and other stakeholders remains the key to take full advantage of innovations that are necessary for aviation cleaner energy transition over the coming decades.

Last year, the ICAO Assembly reached a historic agreement on a long-term global aspirational goal (LTAG) for international aviation of “net-zero carbon emissions by 2050” in support of the Paris Agreement’s temperature goal (*Assembly Resolution A41-21 refers*). The LTAG represents the most important and significant decision of the Organization for the environmentally-sustainable future of international aviation. ICAO and its Member States will work together with industry, civil society and other stakeholders to strive to achieve this collective goal, while recognizing that each State’s special circumstances and respective capabilities will inform the ability of each State to contribute within its own national timeframe.

Achieving net-zero carbon emissions by 2050 will require substantial investment and financing, and putting in place concrete means of implementation for developing countries and States having particular needs. In this regard, ICAO has been implementing its Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) programme to provide tailored support to States on the development and deployment of SAF and other aviation cleaner energy, and to facilitate partnerships and cooperation around the world.

In 2023, ICAO has been organizing a series of outreach events, such as Regional Seminars and LTAG Stocktaking, to globally raise awareness on the outcomes of the Assembly and the recent developments, as well as to prepare for the third ICAO Conference on Aviation Alternative Fuels (CAAF/3) that will take place from 21 to 24 November 2023, in Dubai, United Arab Emirates. The ICAO CAAF/3 is expected to deliver an ICAO global framework for aviation cleaner energy in support of the LTAG implementation.

While agreeing on the LTAG, States and the industry have been implementing the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which complements aviation’s CO₂ emissions reduction measures to achieve the ICAO aspirational goal of carbon neutral growth from 2020. The ICAO Assembly reaffirmed the continuous commitment of States to implement CORSIA, while putting in place necessary adjustments to the CORSIA baseline and other design elements for future phases. ICAO will continue to follow-up on further developments related to Article 6 of the Paris Agreement, in particular any implications for CORSIA eligible emissions units.

ICAO is fully cognizant of the challenges associated with addressing the impacts of international aviation on the global climate. All stakeholders in the aviation ecosystem will play their part, and ICAO remains fully committed in leading the sector’s efforts towards cleaner energy transition.

1. INTRODUCTION

1.1 The 41st Session of the ICAO Assembly, held from 27 September to 7 October 2022, considered the recommendations presented by the ICAO Council and adopted¹:

- **Assembly Resolution A41-21** on international aviation and climate change, including the agreement on net-zero carbon emissions by 2050 (refer to **Appendix A** of this submission); and
- **Assembly Resolution A41-22** on Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (refer to **Appendix B** of this submission).

2. NET ZERO CARBON EMISSIONS BY 2050 FOR INTERNATIONAL AVIATION

2.1 The ICAO Assembly considered the Council proposal on international aviation and climate change, taking into account the delicately-balanced conclusions of the High-level Meeting on the Feasibility of a Long-Term Aspirational Goal for International Aviation CO₂ Emissions Reductions held in July 2022, and subsequently adopted Resolution A41-21, including the following key features:

- **Level of Ambition:** ICAO and its Member States are encouraged to work together to strive to achieve a collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement’s temperature goal, recognizing that each State’s special circumstances and respective capabilities will inform the ability of each State to contribute to the LTAG within its own national timeframe. It was also recognized that the LTAG is a collective goal and it does not attribute specific obligations or commitments in the form of emissions reduction goals to individual States (*refer to A41-21, operative paragraphs 7 and 8*);
- **Monitoring of Progress:** The Assembly requested the Council to regularly monitor the progress on the implementation of all elements of the basket of measures towards the achievement of the LTAG, including through the ICAO stocktaking process, updates of the ICAO Vision for Sustainable Aviation Fuels (SAF), and monitoring of State Action Plans (*refer to A41-21, operative paragraph 9*). In this regard, 2023 ICAO Stocktaking event is planned for 11-13 July 2023 and more information is provided below.
- **State Action Plans:** The Assembly reiterated the important role of State Action Plans, encouraging all States to submit and update action plans to reduce CO₂ emissions from international aviation, outlining policies, actions and roadmaps, including long-term projections, and requested the Council to provide guidance and assistance, e.g., for identifying possible sources of financing for the implementation of action plans (*refer to A41-21, operative paragraphs 10 to 13*). More information on State Action Plans is provided below.
- **Means of Implementation:** The Assembly recognized that various possible modalities and/or funding mechanisms could be used by ICAO, and requested the Council to initiate specific measures or mechanisms for ICAO to facilitate better access to financing for developing countries and States having particular needs, and to consider the establishment



¹ Four States (Brazil, China, Russian Federation, and Venezuela) expressed their reservations to the adopted Assembly Resolutions A41-21 and A41-22.

of a possible finance initiative or funding mechanism under ICAO, for reporting at the 42nd Session of the Assembly. This is complementary to a robust assistance and cooperation programme for LTAG, such as the ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) programme, which should be extended to an ACT-LTAG programme to add support to other CO₂ reduction measures (*refer to A41-21, operative paragraphs 17 and 18 found in Appendix A to this document*). More information on ICAO ACT-SAF programme is provided below; and

- **Actions on Technology, Operations and Fuels:** The Assembly requested specific actions for the Council and Member States in the areas of technology, operations and fuels, including the convening of the third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) in 2023, with a view to updating the 2050 ICAO Vision for SAF, including Lower Carbon Aviation Fuels (LCAF) and other cleaner energy sources for aviation, in order to define a global framework (*refer to A41-21, operative paragraphs 21 to 28 found in Appendix A to this document*). More information on the preparation of CAAF/3 is provided below .

2.2 This LTAG agreement was based on its feasibility study undertaken by the ICAO Committee on Aviation Environmental Protection (CAEP) and the publication of the LTAG report² in early 2022, which emphasizes the potential for significant CO₂ reductions through aviation in-sector measures, including innovative technologies, operations, and fuels.

2.3 The LTAG agreement constitutes a historic achievement for ICAO that complements the other two ICAO aspirational goals (carbon neutral growth and continuous energy efficiency improvements) and advances its work on minimizing the impact of aviation on the global climate, in support of the Paris Agreement's temperature goal. Additional information on ICAO's work on LTAG is provided in the ICAO Environmental Report 2022³ and in a video recently released by the ICAO Secretariat accessible from this link: <https://youtu.be/9jj8LyLcu2w> .

3. ICAO ACT-SAF PROGRAMME

3.1 In June 2022, the ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) programme was launched, to provide tailored support for States in various stages of SAF development and deployment, facilitate partnerships and cooperation under ICAO coordination, and serve as a platform to facilitate knowledge sharing and recognition of all SAF initiatives around the world. The activities envisaged under the ACT-SAF include training programmes, feasibility studies, support for SAF certification and policy development, as well as the implementation of specific SAF projects, and the establishment of partnerships amongst States and other stakeholders.

3.2 As of May 2023, 75 States and 35 Organizations have expressed interest to join the ACT-SAF programme, and are recognized on the ICAO ACT-SAF platform (see Figure 1)⁴. Due to the tailored support envisaged, each interested party is being contacted for the identification of requests and offers of support under the ACT-SAF programme. As the ACT-SAF partners have expressed a strong need to receive training related to SAF, ICAO has been undertaking a set of ACT-SAF training sessions on an array of important SAF-related topics, with contributions from ACT-SAF partners as appropriate. The most recent training session on SAF policies in March 2023 gathered over 150 participants.

3.3 In addition, a template for SAF feasibility studies is currently being developed under the ACT-SAF programme, toward a harmonized approach for SAF feasibility study, which aims to

² ICAO LTAG Report website: <https://www.icao.int/environmental-protection/Pages/LTAG.aspx> .

³ ICAO ENV Report 2022 website: <https://www.icao.int/environmental-protection/Pages/envrep2022.aspx> .

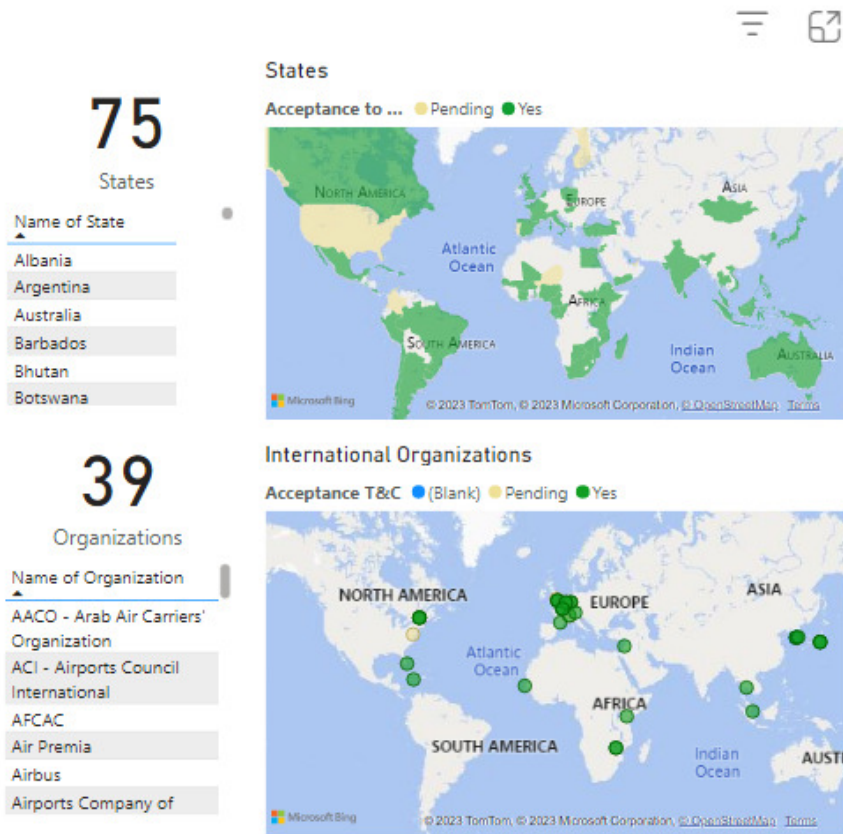
⁴ ICAO ACT-SAF website: <https://www.icao.int/environmental-protection/Pages/act-saf.aspx> .

ensure coherence across studies, enable better comparability between study results, and facilitate its outreach and access to investment and financing.

3.4 Recognizing the importance of financing in aviation decarbonization, ICAO continues to actively engage financial institutions such as development banks and private equity entities through regional meetings and bilateral exchanges, as well as the high-level exchange of views under the ICAO Council, by communicating on the LTAG and the crucial role of SAF and other cleaner energy and the associated investment needs for aviation.



Here you will find more information on ACT-SAF Participants* and Initiatives.



* States and Organizations that expressed intention to actively participate in the ACT-SAF Programme

Figure 1 – States and Organizations that expressed intention to participate in ACT-SAF Programme

4. ICAO THIRD CONFERENCE ON AVIATION ALTERNATIVE FUELS (CAAF/3)

4.1 While welcoming the establishment of the ICAO ACT-SAF programme above, the 41st Session of the Assembly furthermore requested the ICAO Council to:

- continue to assess progress on the development and deployment of sustainable aviation fuels (SAF), lower carbon aviation fuels (LCAF) and other cleaner energy sources for aviation as part of the ICAO stocktaking process, and
- convene the third ICAO Conference on Aviation Alternative Fuels (CAAF/3) in 2023 for reviewing the 2050 ICAO Vision for SAF, including LCAF and other cleaner energy sources for aviation, in order to define a global framework in line with the *No Country Left Behind* (NCLB) initiative and taking into account national circumstances and capabilities (*refer to A41-21, operative paragraph 28 f) found in Appendix A to this document*).

4.2 To facilitate the preparations and consultations for CAAF/3, the ICAO Council endorsed a preparatory process and activities to support States ahead of the conference. For example, ICAO organized a series of five regional seminars in April and May 2023, to raise awareness on the results of the ICAO Assembly and the progress of work related to SAF, LCAF and other aviation cleaner energy. The regional seminars also included dialogues among participants around on topics such as: 1) supporting policies to promote the development and deployment of cleaner energy for aviation; 2) assistance, capacity-building and training for cleaner energy, including ICAO ACT-SAF programme; 3) financing cleaner energy; and 4) exchange of views on the expectations for CAAF/3⁵.

4.3 Moving forward towards CAAF/3, ICAO will hold an LTAG Stocktaking event and Pre-CAAF/3 policy and finance consultations, from 11 to 13 July 2023 at ICAO Headquarters. The event will build upon the continued success of annual ICAO Stocktaking events, and will cover all aviation in-sector CO₂ reduction measures, including the latest developments and innovations from technologies, operations, fuels and cleaner energies. In the lead up to CAAF/3, the focus this year will be on fuel-related approaches and solutions, showcasing the latest information from States, industry and other stakeholders. The ICAO LTAG Stocktaking will be followed by a pre-CAAF/3 initial consultation among States, focusing on policy and finance matters, with involvement of public and private financial institutions and other relevant stakeholders, to consider relevant elements of a global framework for aviation cleaner energy⁶.

4.4 The second pre-CAAF/3 consultation will be held from 25 to 26 September 2023 at ICAO Headquarters to undertake consultation among States on possible CAAF/3 outcomes for ICAO global framework for aviation cleaner energy. The CAAF/3 will take place from 21 to 24 November 2023 in Dubai, United Arab Emirates (UAE), and the outcomes of the conference will be part of ICAO's inputs to the UNFCCC COP28 from 30 November to 12 December 2023.

5. ICAO STATE ACTION PLANS INITIATIVE⁷

5.1 As of May 2023, 138 States representing over 98% of global international aviation traffic (in Revenue Tonne Kilometres (RTK)) have voluntarily submitted their State Action Plans (SAPs) to ICAO (see Figure 2). The previous 2020 – 2022 triennium received the highest number of updated SAPs from 56 States, signalling that States are cooperating and sharing their planned and implemented actions to reduce aviation CO₂ emissions.

5.2 Following the adoption of the LTAG and in line with Resolution A41-21, paragraphs 10 to 13, all States are encouraged to submit and update quantified SAPs to ICAO as soon as possible preferably by the end of June 2024, encompassing innovations in technologies and cleaner energies, outlining respective policies, actions and roadmaps, including long-term projections and ensuring the

⁵ ICAO Regional Seminars website: <https://www.icao.int/Meetings/RS2023/Pages/default.aspx>

⁶ ICAO Stocktaking website: <https://www.icao.int/Meetings/Stocktaking2023/Pages/default.aspx>

⁷ ICAO State Action Plans website: https://www.icao.int/environmental-protection/Pages/ClimateChange_ActionPlan.aspx

use of the best available data, all supported by ICAO guidance and tools. All the latest information related to State Action Plans and capacity-building activities are updated on the ICAO website.

5.3 The Secretariat is also updating the ICAO document, *Guidance on the Development of States' Action Plan on CO₂ Emissions Reduction Activities* (Doc 9988) in order to provide up-to-date guidance and support for States to incorporate their initiatives in the development of their action plans, and contribute to the achievement of collective ICAO global aspirational goals. With this updated guidance, States will have better support to demonstrate decarbonisation pathways through innovations in a robust, quantitative and forward-looking manner.

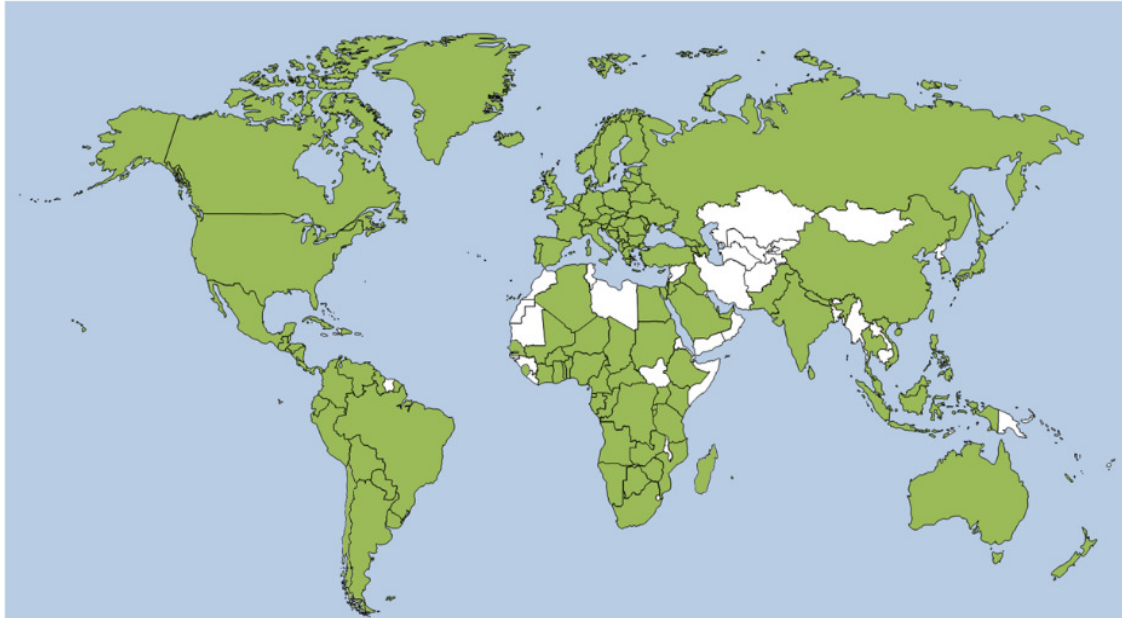


Figure 2 -138 Member States submitted their Action Plans

5.4 Building on the successful partnership between ICAO and the European Union (EU) and to ensure that *No Country is Left Behind*, ICAO initiated the Phase II of the *ICAO Capacity Building for CO₂ Mitigation from International Aviation assistance project*, with funding from the EU, to develop and implement ten State Action Plans (SAPs) in African States. All ten State Action Plans have been developed and submitted, and three SAF feasibility studies are being developed under this project.

6. CARBON OFFSETTING AND REDUCTION SCHEME FOR INTERNATIONAL AVIATION (CORSA)⁸

6.1 While ICAO and its Member States have agreed on the LTAG, a concrete mechanism had already been in place to complement aviation in-sector CO₂ reduction measures and achieve the medium-term goal of 2020 carbon neutral growth for international aviation, through the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) (see Figure 3).

6.2 CORSA was agreed at the 39th Session of the ICAO Assembly in 2016, as the first-ever global market-based measure for any industry sector, reflecting many years of intensive efforts and negotiations by Member States in cooperation with the aviation industry and other stakeholders. Since its agreement, timely implementation of CORSA has been a top priority for ICAO. Despite the challenges of the COVID-19 pandemic on international aviation, joint efforts of Member States have made it possible for the implementation of CORSA according to its established schedule.

⁸ ICAO CORSA website: www.icao.int/corsia

Milestones for CORSIA Implementation

- a) In June 2018 – less than 2 years since the CORSIA agreement – the ICAO Council adopted the Standards and Recommended Practices that put in place the concrete and robust requirements for CORSIA implementation;
- b) In July 2018, ICAO launched the Assistance, Capacity-building and Training for CORSIA (ACT-CORSIA) programme to assist the implementation of the Scheme, including the establishment of partnerships among Member States (see more information below);
- c) From 1 January 2019, States and aeroplane operators started to implement the CORSIA MRV system, including monitoring, reporting and verification of CO₂ emissions from international flights, and the reporting of CORSIA-specific data to ICAO through the CORSIA Central Registry (CCR) on an annual basis (see more information below);
- d) Prior to the start of CORSIA’s pilot phase (2021-2023), all necessary CORSIA Implementation Elements had been put in place to facilitate the implementation of the scheme. The ICAO Council approved eight emissions unit programmes that could supply CORSIA eligible emissions units for the pilot phase. Regarding CORSIA eligible fuels⁹, sustainability criteria, life-cycle emissions values and methodologies, and certification schemes applicable to the pilot phase were defined;
- e) As requested by the Assembly, the ICAO Council conducted the first (2022) CORSIA periodic review, which was significantly influenced by the outbreak of the COVID-19 pandemic. The resulting recommendations on amendments to the CORSIA design elements were adopted by the 2022 ICAO Assembly, namely:
 - Use of 2019 CO₂ emissions as the CORSIA baseline for the pilot phase (2021 – 2023), and use of 85% of 2019 CO₂ emissions as the CORSIA baseline after the pilot phase (2024 – 2035) (see Figure 3); and
 - Revised percentages of the sectoral and individual operator’s growth factors for the calculation of CORSIA offsetting requirements to aeroplane operators: 100% sectoral for 2021 – 2032; and 85 % sectoral and 15% individual for 2033 – 2035;

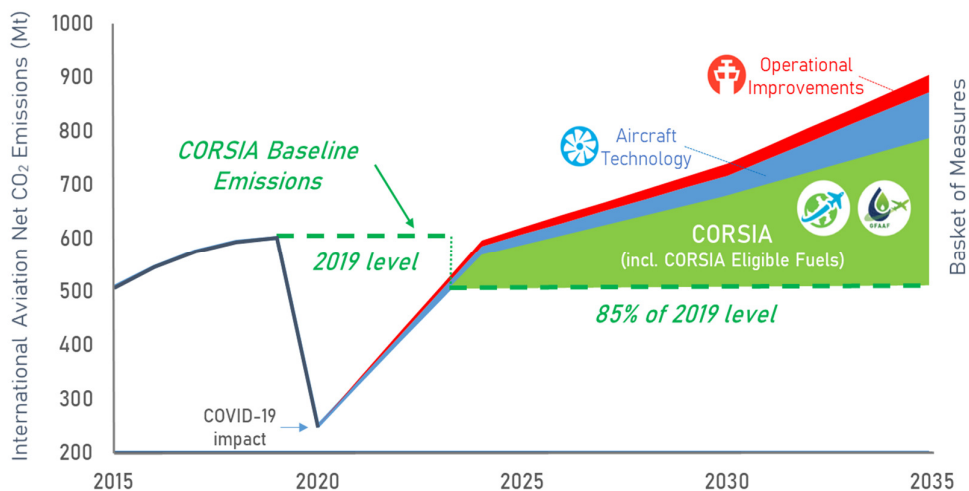


Figure 3 - Contribution of CORSIA for reducing international aviation net CO₂ emissions.

⁹ CORSIA eligible fuels include Sustainable Aviation Fuels (SAF) and Lower Carbon Aviation Fuels (LCAF).

- f) Work continued in 2022 and 2023 to update the various CORSIA Implementation Elements, including their application in CORSIA's first phase (2024-2026). In this regard, two milestones are particularly significant:
- Regarding CORSIA eligible emissions units, the ICAO Council approved to apply a 2021 vintage start date in addition to the existing 2016 crediting start date parameter for the first phase. Work has also been initiated for the assessment of the eligibility of emissions unit programmes for the first phase, with the approval of two programmes to become immediately eligible for the first phase. In this regard, ICAO welcomes the progress made at the COP 26 and COP 27, and will continue to monitor further developments on Article 6 of the Paris Agreement, in particular any implications for the eligibility of emissions units under CORSIA; and
 - Regarding CORSIA eligible fuels, the ICAO Council approved the CORSIA sustainability criteria applicable to these fuels during the first phase.

Voluntary participation in CORSIA

6.3 The number of ICAO Member States that voluntarily participate in the offsetting requirements of CORSIA since the start of the scheme's pilot phase has increased from 88 States for 2021, 107 States for 2022, to 115 States for 2023. Six more States have so far notified ICAO of their voluntary participation from 1 January 2024, bringing the total number of volunteer States at the start of CORSIA's first phase to 121. This number is expected to increase prior to the 30 June 2023 deadline for the receipt of further notifications from States.

CORSIA Central Registry

6.4 The data reported by States through the CORSIA Central Registry (CCR) serves as the basis for the preparation of CCR-related ICAO documents, featuring information such as: list of aeroplane operators attributed to States, list of accredited verification bodies, annual CO₂ emissions and CORSIA eligible fuels. Data collected through the CCR allows for the calculation of the CORSIA annual Sector's Growth Factor (which in turns is used to determine annual CORSIA offsetting requirements for aeroplane operators) and its publication on the ICAO website. Data reported through the CCR so far shows that close to 100% of the total CO₂ emissions have been reported by States for the years 2019, 2020 and 2021; this is an indication of the determination of both States and aeroplane operators to ensure the successful implementation of CORSIA.

ICAO ACT-CORSIA Programme

6.5 In July 2018, ICAO launched the ACT-CORSIA (Assistance, Capacity-building and Training for CORSIA) programme as part of the ICAO's *No Country Left Behind* initiative, with the aim to assist all Member States with the implementation of CORSIA. The Assembly Sessions held in 2019 and 2022 emphasized the importance of a coordinated approach under the ACT-CORSIA to harmonize and bring together all relevant actions and promote coherence to capacity building efforts.

6.6 The Buddy Partnerships among States are the cornerstone of the ACT-CORSIA programme, currently involving 17 supporting States and 119 requesting States (See Figure 4). Through such partnerships, supporting States offer experts on CORSIA to provide individual training and undertake the necessary follow-up with the CORSIA focal points of the requesting States, in close coordination with the ICAO Secretariat. In this regard, those experts from supporting States have been trained by ICAO to provide harmonized training to the requesting States. Recognizing the importance of providing continued support to States for CORSIA implementation, ICAO Secretariat has also organized a series of seminars/webinars sessions, as well hands-on training for the use of CORSIA Central Registry.



Figure 4 - ICAO ACT-CORSIA Buddy Partnerships among 136 States

7. UNFCCC – CLIMATE FINANCE

7.1 The Paris Agreement and associated COP21 decision did not include a reference to international aviation. One of the key elements in the Paris 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. In addition, 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 1/CP.21, paragraphs 53 and 114).

7.2 It should be noted that in 2010, ICAO Member States adopted global aspirational goals for the international aviation sector for improving the sector's fuel efficiency by two percent per year and keeping its global CO₂ emissions from 2020 at the same level. These aspirational goals were affirmed by the 38th (2013), 39th (2016), 40th (2019) and 41st (2022) Sessions of the ICAO Assembly (*refer to Resolution A41-21, operative paragraphs 4 and 6*). In addition, the 41st (2022) Session of the ICAO Assembly also adopted a long-term global aspirational goal for the international aviation sector of net-zero carbon emissions by 2050 (*refer to Resolution A41-21, operative paragraph 7 found in Appendix A to this document*).

7.3 The achievement of these ICAO global aspirational goals requires adequate financial resources within the international aviation sector itself, enabling it to effectively respond to the global climate change challenge. The growing commitment of Member States and other partners to support ICAO's capacity-building and assistance efforts (e.g. refer to ICAO ACT-SAF and ACT-CORSIA programmes above) also demonstrates how critical these activities and resources are to the achievement of the ICAO global aspirational goals.

7.4 In this regard, the 41st (2022) Session of the ICAO Assembly urged that "ICAO and its Member States express a clear concern, through the UNFCCC process, on the use of international aviation as a potential source for the mobilization of revenue for climate finance to the other sectors, in order to ensure that international aviation would not be targeted as a source of such revenue in a disproportionate manner" (*refer to Resolution A41-21, operative paragraph 16 found in Appendix A to this document*).

Appendix A

Resolution A41-21: 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 continue to account for less than 2 per cent of total global CO₂ emissions, and they are projected to increase as a result of the continued growth of air transport, unless action for emissions reduction is taken;

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;

Whereas the Glasgow Climate Pact, which was adopted by the Conference of the Parties to the UNFCCC in November 2021, reaffirms the long-term global goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue 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, and the Glasgow Climate Pact also recognizes that the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2°C and resolves to pursue efforts to limit the temperature increase to 1.5°C;

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, 39th and 40th Sessions in 2013, 2016 and 2019, respectively;

Acknowledging the substantial ICAO work undertaken to explore the feasibility of a long-term global aspirational goal (LTAG) for international aviation in light of the 2°C and 1.5°C temperature goals of the Paris Agreement;

Recognizing the information-sharing and consultative process on the feasibility of an LTAG for international aviation, including the ICAO stocktaking on aviation in-sector CO₂ emissions reduction, and the convening of ICAO Global Aviation Dialogues (GLADs) and the High-level Meeting on the Feasibility of a Long-Term Aspirational Goal for International Aviation CO₂ Emission Reductions, since the 40th Session of the ICAO Assembly;

Recognizing that the ICAO *Report on the Feasibility of a Long-Term Aspirational Goal for International Civil Aviation CO₂ Emission Reductions*, which assessed the technical feasibility of various aviation in-sector CO₂ emissions reduction scenarios, serves as the basis for the consideration of the LTAG;

Recognizing that 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 do not deliver the level of reduction necessary to 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 CO₂ efficiency by an average of 1.5 per cent per annum from 2009 until 2020, to achieve carbon neutral growth from 2020 and to achieve a long-term goal of net-zero carbon emissions by 2050;

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 prejudice 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, sustainable aviation fuels, operational improvements and market-based measures to reduce emissions and possible evolution of Standards and Recommended Practices (SARPs), 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 1960s, *while observing* an unprecedented level of emerging new technologies and innovations towards green aviation transition;

Acknowledging the adoption of the CO₂ emissions certification Standard for aeroplanes by the Council in March 2017, and the need to keep this Standard up to date based on the latest aircraft efficiency technology improvements;

Acknowledging the need for the timely update and development of relevant ICAO environmental SARPs and guidance for new advanced aircraft technologies, as appropriate;

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 Global Air Navigation Plan contribute to enhanced operational efficiency and the reduction of aircraft CO₂ 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 global horizontal and vertical flight efficiency analysis;

Welcoming the convening of the ICAO Seminars on Green Airports in November 2017, May 2019 and November 2021, and *recognizing* the important role of airports in the distribution of new innovative sources of energy to air transport;

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, including the increasing number of fuel conversions processes, and airports distributing such fuels for more commercial flights;

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, and the need to update the 2050 ICAO Vision to include a quantified proportion of such fuels to be used by 2050;

Recognizing that the technological feasibility of drop-in sustainable aviation fuels is proven and such fuels are expected to have the largest impact on aviation CO₂ emissions reduction by 2050 and continue to have a large impact beyond 2050, and that the introduction of appropriate policies and incentives to create a long-term market perspective is required;

Recognizing the continuing developments in drop-in fuels such as sustainable aviation fuel (SAF) and lower carbon aviation fuel (LCAF) to reduce aviation CO₂ emissions, and *welcoming* the development of new fuels and cleaner energy sources for aviation, including the use of hydrogen and renewable electricity;

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 developed and updated as part of work for the implementation of Carbon Offsetting and Reduction Scheme for International Aviation (CORSA);

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, A39-2 and A40-18, which are reproduced in the Annex to this Resolution;

Noting that 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 with 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 CO₂ 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 July 2022, 133 Member States that represent more than 98 per cent of global international air traffic voluntarily prepared and submitted action plans to ICAO;

Recognizing the need to further develop and update State Action Plans, including the quantification of CO₂ emissions reduction benefits with practical tools, for sustainable aviation and infrastructure with the focus on environment-driven innovations;

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' actions to reduce aviation emissions, as well as to continuously search for potential assistance partnerships with other organizations;

Welcoming the launch of the ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuel (ACT-SAF) Programme to support the development and deployment of SAF, including the establishment of partnerships among States and relevant stakeholders, in line with the *No Country Left Behind* (NCLB) initiative;

Recognizing that, according to the latest reports from the IPCC, progress in climate change adaptation planning and implementation has been observed across all sectors and regions, but it is still being unevenly distributed with several adaptation gaps observed, including potential vulnerabilities of key transport infrastructures such as international aviation systems and infrastructures, meaning that their design standards should give due consideration to account for projected climate impacts and risks;

Recognizing the need for enabling conditions for the implementation of long-term climate change adaptation measures, especially for vulnerable parts of the aviation system and infrastructure, which would enhance the preparedness level of the international aviation sector for projected extreme and disruptive climate-related events;

Recognizing the importance of work being undertaken to identify the potential impacts of

climate change on international aviation operations and related infrastructure, together with identified options of adaptation measures; 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 A41-20: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality* and Resolution A41-22: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, supersede Resolutions A40-17, A40-18 and A40-19 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 as needed, 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, while also recognizing the long-term global aspirational goal in paragraph 7 below;

7. *Further resolves* that, in addition to the medium-term global aspirational goal in paragraph 6 above, ICAO and its Member States are encouraged to work together to strive to achieve a collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement's temperature goal, recognizing that each State's special circumstances and respective capabilities (e.g. the level of development, maturity of aviation markets, sustainable growth of its international aviation, just transition, and national priorities of air transport development) will inform the ability of each State to contribute to the LTAG within its own national timeframe;

8. *While recognizing* that the LTAG is a collective global aspirational goal, and it does not attribute specific obligations or commitments in the form of emissions reduction goals to individual States, *urges* each State to contribute to achieving the goal in a socially, economically and environmentally sustainable manner and in accordance with national circumstances;

9. *Requests* the Council to regularly monitor progress on the implementation of all elements of the basket of measures towards the achievement of the LTAG, including through: the ICAO environment stocktaking process; the review of the ICAO Vision for SAF; further assessment of the CO₂ emissions reduction and cost impacts of a changing climate on international aviation, regions and countries, in particular developing countries, and the impact on the development of the sector, as well as the cost impacts of the efforts to achieve the LTAG; monitoring of information from State Action Plans for international aviation CO₂ emissions reduction; and means of implementation. To this purpose, the Council will consider necessary methodologies for the monitoring of progress, and report to a future Session of the ICAO Assembly;

10. *Further encourages* all States to submit and update voluntary action plans to ICAO to reduce CO₂ emissions from international aviation, outlining respective policies, actions and roadmaps, including long-term projections;

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 2024 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 for the implementation of the measures;

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 2024, including through cooperation and assistance on identifying possible sources of financing for decarbonization of aviation in cooperation with financial and other relevant organizations, 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 standards, methodologies and a mechanism to measure/estimate, monitor and verify global GHG emissions from international aviation, and that States support the work of ICAO on measuring progress through the reporting of annual data on traffic, fuel consumption and CO₂ 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 CO₂ emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementation actions in the sector based on information approved by its Member States;

16. *While recognizing* that no effort should be spared to obtain means to support the reduction and stabilization of CO₂ 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. *Recognizes* that means of implementation commensurate to the level of ambition, including financing, will promote the achievement of the LTAG. It requires substantial investments for States, according to their national circumstances, and that various possible modalities and/or funding mechanisms could be used by ICAO to facilitate financing and investment support for implementation of specific aviation CO₂ emissions reduction measures;

18. *Requests* the Council to:

- a) initiate specific measures or mechanisms so as to facilitate, in particular for developing countries and States having particular needs, better access to private investment capacities, as well as funding from financial institutions, such as development banks, for projects contributing to the decarbonization of international aviation, as well as encourage new and additional funding to this purpose;
- b) further consider the establishment of a climate finance initiative or funding mechanism under ICAO, while addressing the possible financial, institutional and legal challenges, and report to the 42nd Session of the ICAO Assembly;
- c) subparagraphs a) and b) above will be complementary to a robust assistance and cooperation programme dedicated to LTAG in order to share information on best practices and provide guidance, capacity building, and other technical assistance. Welcoming the establishment of the ICAO Assistance, Capacity-building and Training for SAF (ACT-SAF) programme, it should be extended to add support to the implementation of other emissions reduction measures in an ICAO ACT-LTAG programme (e.g. aircraft technologies, operational improvements, infrastructural changes, LCAF and other cleaner energy sources for aviation);
- d) promote the voluntary transfer of technology, in particular for developing countries and States having particular needs, to enable them to adapt to cutting-edge technology and to enhance their contribution to achieve the LTAG; and
- e) in line with the *No Country Left Behind* initiative, urge ICAO Member States to make regular and substantial contributions to the ICAO Environment Fund, to address specific ICAO activities on the LTAG, including the ACT-SAF programme, aiming at assisting developing States and States having particular needs. States are also encouraged to develop specific projects under the ICAO Technical Cooperation Programme.

19. *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;

20. *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 and to adapting international aviation systems and infrastructure to climate change impacts and risks;
- 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;

21. *Invites* the Council and Member States to work together with relevant organizations to strive to achieve the maximum possible level of progress on the implementation of aviation in-sector CO₂ emissions reduction measures (e.g. technology, operations and fuels), recognizing that the largest potential impact on aviation CO₂ emissions reduction will come from fuel-related measures;

22. *Encourages* the Council and Member States to keep abreast of innovative aircraft technologies, new types of operations conducive to emissions reductions, and sustainable aviation fuels (SAF), lower carbon aviation fuels (LCAF) and other cleaner energy sources in line with the *No Country Left Behind* initiative, in order to enable timely certification, as well as timely update and development of relevant ICAO SARPs and guidance, as appropriate. ICAO and its Member States are urged to continue work on the elements of the basket of measures for the achievement of the LTAG, including paragraphs 23 to 28 below;

23. *Requests* States to:

- a) consider policies to encourage the introduction of increasingly fuel efficient aircraft into the market and facilitate cost-effective fleet renewal by manufacturers and aircraft operators, 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) incentivize and accelerate investments on research and development of new aircraft with zero CO₂ emissions;

24. *Requests* the Council to:

- a) update the CO₂ emissions certification Standard for aeroplanes, as appropriate, based on the latest aircraft efficiency technology improvements;
- b) timely update and develop relevant ICAO environmental Standards and Recommended Practices (SARPs) and guidance for new advanced aircraft technologies, as appropriate; and

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

25. *Requests States to:*

- a) work together with manufacturers, air navigation services providers (ANSPs), aircraft operators and airport operators to accelerate the development and implementation of fuel efficient routings and air navigation procedures and ground operations 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);
- 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;
- c) work together through ICAO to exchange information and best practices on Green Airports, including practices related to airport planning, development, operations and maintenance; and
- d) consider undertaking climate risk assessment to foster the inclusion of climate change adaptation measures into national climate policies and planning processes, with respect to international aviation systems and infrastructures, as appropriate;

26. *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);
- 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 adaptation and resilient development, community engagement and sustainability reporting, aiming at sharing lessons learned and best practices among airports;
- d) publish and maintain guidance material on the implementation of environmentally sustainable practices at airports, including the Eco-Airport Toolkit e-collection; and
- e) encourage States to pursue a climate-resilient development of their aviation systems and infrastructures, with a focus on the development of policies that integrate climate mitigation and adaptation actions to advance the sustainable aviation development;

27. *Requests States to:*

- a) set a coordinated approach in national administrations for policy actions and investment to accelerate the appropriate research, development, deployment and use of cleaner and renewable energy sources for aviation, including the use of sustainable aviation fuel (SAF) and lower carbon aviation fuel (LCAF), in accordance with their national circumstances;
- b) consider the use of incentives to encourage the deployment of cleaner and renewable energy sources for aviation, including SAF and LCAF;

- c) work with relevant stakeholders to accelerate the fuel research, certification and development as well as processing technology and feedstock production, and the certification of new aircraft and engines to allow the use of 100 per cent SAF, in order to decrease costs and support scale-up of sustainable fuel production pathways up to a commercial scale, especially through encouraging and promoting SAF and/or LCAF purchase agreements as well as supporting timely delivery of any necessary changes to airport and energy supply infrastructure, 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;

28. *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 cleaner, renewable sources of energy for aviation, including SAF and LCAF, 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 SAF and LCAF 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 SAF and LCAF and incentives to overcome initial market hurdles;
- e) cooperate with other relevant international initiatives, including the Sustainable Energy for All (SE4ALL) initiative, to facilitate aviation's access to renewable energy; and
- f) continue to assess progress on the development and deployment of SAF, LCAF and other cleaner energy sources for aviation as part of the ICAO stocktaking process, and convene the CAAF/3 in 2023 for reviewing the 2050 ICAO Vision for SAF, including LCAF and other cleaner energy sources for aviation, in order to define a global framework in line with the *No Country Left Behind* (NCLB) initiative and taking into account national circumstances and capabilities;

29. *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 maintain and enhance guidance on climate change risk assessment and adaptation measures for international aviation, in cooperation with other relevant international organizations and the industry; and

30. *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 CO₂ emissions should be accounted for only once;
- g) MBMs should minimize carbon leakage and market distortions;
- h) MBMs should ensure the fair treatment of the international aviation sector in relation to other sectors;
- i) MBMs should recognize past and future achievements and investments in aviation fuel efficiency and in other measures to reduce aviation emissions;
- j) MBMs should not impose inappropriate economic burden on international aviation;
- k) MBMs should facilitate appropriate access to all carbon markets;
- l) MBMs should be assessed in relation to various measures on the basis of performance measured in terms of CO₂ emissions reductions or avoidance, where appropriate;
- m) MBMs should include de minimis provisions;
- n) where revenues are generated from MBMs, it is strongly recommended that they should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions, including mitigation and adaptation, as well as assistance to and support for developing States;
- 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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Appendix B

Resolution A41-22: Consolidated statement of continuing ICAO policies and practices related to environmental protection — Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)

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 (CORSA) 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 Climate and Environment Committee (CEC), its Technical Advisory Body (TAB) and its Committee on Aviation Environmental Protection (CAEP) to support the implementation of CORSA;

Welcoming the adoption of the first edition of Annex 16 – *Environmental Protection*, Volume IV – *Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)*, the provisions of which include Monitoring, Reporting and Verification (MRV) procedures for CORSA;

Also welcoming the publication of the second edition of *Environmental Technical Manual* (ETM, Doc 9501), Volume IV – *Procedures for demonstrating compliance with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)*;

Welcoming the progress made for the development and update of ICAO CORSA 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 CORSA;

Also welcoming the establishment by the Council of the Technical Advisory Body (TAB), with the mandate to make recommendations to the Council on the CORSA 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 CORSA, in particular through the ICAO Assistance, Capacity-building and Training for CORSA (ACT-CORSA) programme that includes the organization of seminars, development of outreach materials, and establishment of CORSA partnerships among States, which have been instrumental to the successful implementation of MRV requirements by States and reporting of annual CO₂ emissions to the CORSA Central Registry;

Welcoming the increasing number of announcements by Member States of their intention to voluntarily participate in CORSA in the pilot phase from 2021, with the voluntary participation of 88 States for 2021, 107 States for 2022, and 115 States for 2023;

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

Recalling the decision of the Council (June 2020) on the use of 2019 emissions instead of 2020 emissions for the implementation of relevant CORSIA design elements (i.e. CORSIA baseline, reference year for calculating an aeroplane operator's offsetting requirements, and new entrant threshold) during the pilot phase, in light of the COVID-19 pandemic and providing safeguards against inappropriate economic burden on aeroplane operators;

Recognizing the completion of the 2022 periodic review of CORSIA by the Council with the technical contribution of CAEP, including the analyses on the impact of the COVID-19 pandemic and its CO₂ recovery scenarios on the CORSIA baseline beyond the pilot phase;

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 CO₂ 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 prejudice the outcome of negotiations under the UNFCCC, the Paris Agreement, or other international agreements, nor represent the position of the Parties to the UNFCCC, the Paris Agreement, or other international agreements;

The Assembly:

1. *Resolves* that this Resolution, together with Resolution A41-20: *Consolidated statement of*

continuing ICAO policies and practices related to environmental protection - General provisions, noise and local air quality and Resolution A41-21: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change, supersede Resolutions A40-17, A40-18 and A40-19 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;

2. *Acknowledges* the progress achieved on all elements of the basket of measures available to address CO₂ emissions from international aviation, including aircraft technologies, operational improvements, sustainable 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 CO₂ emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO₂ emissions from international aviation from 2020 at the same level;

4. *Emphasizes* the role of 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 CO₂ emissions from international civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country) above the 2020 levels, taking into account special circumstances and respective capabilities;

6. *Requests* the Council to continue to ensure all efforts to make further progress on aircraft technologies, operational improvements and sustainable aviation fuels be taken by Member States and reflected in their action plans to address CO₂ emissions from international aviation, and to monitor and report the progress on implementation of action plans, and that a methodology should be developed to ensure that an 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. *Requests* 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 Land Locked 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; and
- 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 and *further decides* that the amount of CO₂ 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 from 2021 through 2023 = (total emissions covered by CORSIA in the given year – total emissions covered by CORSIA in 2019) / total emissions covered by CORSIA in the given year, and the sector's growth factor from 2024 through 2035 = (total emissions covered by CORSIA in the given year – 85% of total emissions covered by CORSIA in 2019) / total emissions covered by CORSIA in the given year;
- c) where the aeroplane operator's growth factor from 2033 through 2035 = (the aeroplane operator's emissions covered by CORSIA in the given year – 85% of the aeroplane operator's emissions covered by CORSIA in 2019) / 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 2019;
 - 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, 100% sectoral and 0% individual;
 - v) from 2033 through 2035, 85% sectoral and 15% individual;
- 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 and *further decides* that a new entrant¹ is exempted from the application of the CORSIA for three years or until the year in which its annual emissions exceed 0.1 per cent of total emissions in 2019, 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 CO₂ emissions from international aviation per year; aeroplanes 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

¹ 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.

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 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, and *requests* the Council to develop a methodology and timeline to conduct such reviews. This will involve, inter alia:

- a) assessment of: progress towards achieving 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 ICAO's environmental objectives;

18. *Determines* that the CORSIA is the only global market-based measure applying to CO₂ emissions from international aviation so as to avoid a possible patchwork of duplicative State or regional MBMs, thus ensuring that international aviation CO₂ 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 Annex 16, Volume IV and the 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 CO₂ 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 maintain and update 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 CEC 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 Paris Agreement, and *encourages* States to use such methodologies in taking actions to reduce aviation CO₂ emissions, which could further enable the use of credits generated from the implementation of such programmes by the CORSIA, without double-counting of emissions reduction.

— END —