



WORKING PAPER

ASSEMBLY — 41ST SESSION

EXECUTIVE COMMITTEE

Agenda Item 17: Environmental Protection – International Aviation and Climate Change

CLIMATE CHANGE

(Presented by the Council of ICAO)

EXECUTIVE SUMMARY

This paper reports on progress made by ICAO since the 40th Session of the Assembly relating to international aviation and climate change, including on the feasibility of a long-term global aspirational goal (LTAG) for international aviation, and on the ICAO State Action Plans initiative for aviation CO₂ emissions reduction, and related assistance and capacity-building projects. The paper also reports on ICAO's cooperation with other United Nations (UN) bodies and international organizations in the field of aviation and climate change.

Action: The Assembly is invited to:

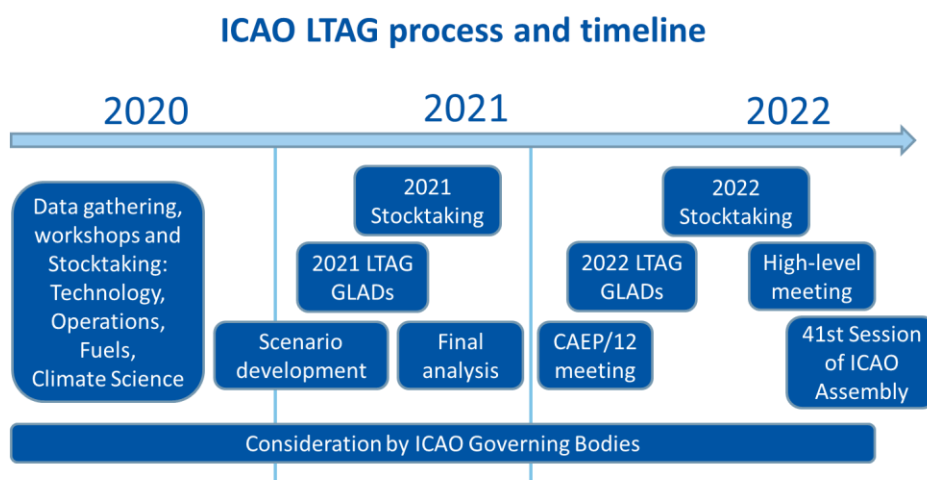
- a) acknowledge the substantial progress achieved by the Organization since the 40th Session of the Assembly on the feasibility of a long-term global aspirational goal (LTAG) for international aviation, including the conclusions of the ICAO High-level Meeting on this subject;
- b) recognize the progress achieved under the ICAO State Action Plans initiative for aviation CO₂ emissions reduction, and encourage States to further engage in the ICAO initiative;
- c) continue to support the Organization in coordinating, facilitating and monitoring actions to reduce international aviation CO₂ emissions and to report on progress by the next Assembly;
- d) support and request States, industry, and organizations to engage in the ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuel (ACT-SAF) programme, which should be extended to add support to the implementation of other emissions reduction measures in an ICAO ACT-LTAG programme;
- e) encourage ICAO to cooperate with, and provide relevant input to, other UN bodies and international organizations, ensuring ICAO's leadership in all matters related to international civil aviation; and
- f) consider the information contained in this paper for the update of Assembly Resolution A40-18.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective – <i>Environmental Protection</i> .
<i>Financial implications:</i>	The activities referred to in this paper will be undertaken subject to the resources available in the 2023 – 2025 Regular Budget and/or from extra budgetary contributions as guided by the ICAO Business Plan 2023-2025.
<i>References:</i>	Doc 10140, <i>Assembly Resolutions in Force</i> (as of 4 October 2019) A41-WP/369, <i>Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate Change</i> Doc 10178, <i>Report of the High-level Meeting on the feasibility of a Long-Term Aspirational Goal for international aviation CO₂ emissions reductions (HLM-LTAG)</i>

1. LONG-TERM ASPIRATIONAL GOAL (LTAG)¹

1.1 In response to the request by the 40th Session of the Assembly in Resolution A40-18, paragraph 9, ICAO and its Member States and other stakeholders made significant efforts in exploring the feasibility of a long-term global aspirational goal (LTAG) for international aviation. In March 2020, the Council agreed with the process to respond to this Assembly request, as described and illustrated below.

- 1) data collection and information sharing (paragraph 1.2 refers);
- 2) technical assessment of CO₂ emissions reduction scenarios with analyses of costs and necessary investments (paragraph 1.3 refers);
- 3) consultation and dialogues among stakeholders (paragraph 1.4 refers); and
- 4) engagement of high-level representatives to facilitate decision (paragraph 1.5 refers).



1.2 Stocktaking for Aviation In-Sector CO₂ Emissions Reductions

1.2.1 As part of the ICAO LTAG work, in particular for data collection and information sharing on aviation in-sector CO₂ emissions reductions, the 2020 and 2021 ICAO Stocktaking events were convened in September 2020² and September 2021³, respectively. During these events, States, industry leaders, researchers and innovators shared their ambitious plans, solutions and policies for carbon emissions reduction from international aviation, including measures from technology, operations and fuels. The High-level Meeting in July 2022 (paragraph 1.5 refers) was preceded by the ICAO Stocktaking on 18 July 2022⁴ to enable the sharing of the latest relevant information and to set the scene for the subsequent Meeting.

1.2.2 In addition, ICAO developed the Tracker Tools website⁵, where all the latest information on aviation CO₂ emissions reduction initiatives is updated from three streams – technology, operations and fuels, as well as on aviation net zero initiatives. Information on partner projects within the ICAO Global Coalition for Sustainable Aviation is also shared. The Coalition is a forum of stakeholders which aims to facilitate the development of new ideas and accelerate the implementation of innovative solutions that will further reduce greenhouse gases (GHG) emissions at source, on the ground or in the sky.

1.2.3 The ICAO Secretariat will continue to facilitate the monitoring of the latest environment-driven technologies and innovations to reduce aviation CO₂ emissions, including through the continued

¹ ICAO LTAG webpage: <https://www.icao.int/environmental-protection/Pages/LTAG.aspx>

² 2020 Stocktaking website: <https://www.icao.int/Meetings/Stocktaking2020/Pages/default.aspx>

³ 2021 Stocktaking website: <https://www.icao.int/Meetings/Stocktaking2021/Pages/default.aspx>

⁴ 2022 Stocktaking website: <https://www.icao.int/Meetings/Stocktaking2022/Pages/default.aspx>

⁵ ICAO Tracker Tools website: [Aviation CO₂ emissions reduction initiatives - Tracker Tool \(icao.int\)](https://www.icao.int/aviation-co2-emissions-reduction-initiatives-tracker-tool/)

ICAO Stocktaking. As part of the process for monitoring progress, and in response to the request by the second ICAO Conference on Aviation and Alternative Fuels (CAAF/2) in 2017, ICAO plans to convene the third conference (CAAF/3) in 2023, with the aim of reviewing and updating the 2050 ICAO Vision for Sustainable Aviation Fuels (SAF), including Lower Carbon Aviation Fuels (LCAF) and other cleaner energy sources for aviation, in order to provide a global framework and a quantified proportion of such fuels to be used by 2050 (refer to paragraph 1.5 on the conclusions of the High-level Meeting).

1.3 LTAG Scenarios and Analyses (LTAG Report)

1.3.1 Following the 40th Session of the Assembly and subsequent request by the Council, the ICAO Committee on Aviation Environmental Protection (CAEP) undertook its technical work on the feasibility study on LTAG, focused on the attainability and readiness of aviation in-sector CO₂ reduction measures, including aircraft technologies, operations and fuels, as it would be important to assess the in-sector CO₂ reduction potentials before considering the need and extent of any complementary measure. The CAEP/12 meeting in February 2022 unanimously approved the LTAG report⁶, including long-term emissions reduction scenarios, through the aviation in-sector measures, with the assessment of required costs and investments. The LTAG report also included other findings, such as the need for capacity building and assistance for the implementation of measures, and the progress reporting for the achievement of LTAG.

1.3.2 Under the LTAG report, three integrated scenarios (IS1, IS2, and IS3) were developed, over a timeframe extended to 2070, to cover a range of readiness, attainability, and aspiration. Under the low/nominal scenario (IS1), emissions in 2050 would be reduced by 39%, broken down into 20% from aircraft technologies, 4% from operations and 15% from fuels, meaning emissions could reach approximately 950 MtCO₂ in 2050 (or 1.6 times the 2019 CO₂ emissions level). In the middle IS2 scenario, CO₂ emissions could reach approximately 500 MtCO₂ in 2050 (0.8 times the 2019 CO₂ emissions level), meaning emissions in 2050 would be reduced by 68%, broken down into 21% from aircraft technologies, 6% from operations, and 41% from fuels. In the most ambitious IS3 scenario, residual CO₂ emissions could reach approximately 200 MtCO₂ in 2050 (a third of the 2019 CO₂ emissions level), meaning a reduction by 87%, broken down into 21% from aircraft technologies, 11% from operations and 55% from fuels. The LTAG report also included the analyses on the costs and necessary investments, by governments and industry stakeholders, associated with the emissions reductions related to the three LTAG scenarios.

1.3.3 Recognizing the invaluable contributions of CAEP to deliver a high standard and quality of work, within a short timeframe, the Council agreed that the LTAG report would be used as the input for further considerations by States and stakeholders, including at the Global Aviation Dialogues (GLADs).

1.4 LTAG Global Aviation Dialogues (GLADs)

1.4.1 As part of the consultative process on LTAG among States and other stakeholders, ICAO organized the LTAG Global Aviation Dialogues (GLADs) as a series of five regional events both in May 2021⁷ and March/April 2022⁸, with the aim of sharing information and raising awareness on the LTAG process and technical analyses.

1.4.2 The dialogue sessions enhanced overall understanding of the LTAG report among the participants. For example, regarding the cost impacts assessment in the LTAG report and on who would bear the costs, it was clarified that the LTAG analysis was undertaken at a global level without attributing costs to individual States, as LTAG would be a collective goal for the global international aviation sector and it would not set obligations in the form of emissions reductions goals to individual States. Once a LTAG decision is made, States will be contributing to the collective goal differently (e.g. by State Action Plans).

⁶ ICAO LTAG report: <https://www.icao.int/environmental-protection/LTAG/Pages/LTAGreport.aspx>

⁷ 2021 GLADs website: <https://www.icao.int/Meetings/2021-ICAO-LTAG-GLADS/Pages/default.aspx>

⁸ 2022 GLADs website: <https://www.icao.int/Meetings/2022-ICAO-LTAG-GLADS/Pages/default.aspx>

1.4.3 To support the well-informed deliberations at the High-level Meeting on LTAG in July 2022 (paragraph 1.5 refers), the GLADs participants also exchanged views on possible building blocks for LTAG considerations, such as: scientific understanding and context, expected potential contribution of technology, operations and fuels, and the level of LTAG ambition. The participants also discussed on possible means of implementation, support to States with action plans and roadmaps, and ways of monitoring progress. Participants expressed concern regarding the different circumstances and readiness levels of individual States, emphasizing the critical importance of providing necessary means of implementation of specific aviation CO₂ reduction measures, particular to developing countries and States having particular needs.

1.5 High-level Meeting on LTAG (HLM-LTAG)

1.5.1 The ICAO High-level Meeting on LTAG (HLM-LTAG) was convened from 19 to 22 July 2022 in Montréal, Canada, in a hybrid format with in-person and virtual participation, including 428 delegates from 104 Member States and 58 delegates from 15 international organizations. The Meeting began on 19 July with an inspirational ICAO video⁹ on the LTAG process, followed by the opening address by the President of the ICAO Council. A keynote address was provided by Dr Bertrand Piccard, Initiator and Chairman, Solar Impulse Foundation. The Meeting noted the setting of the scene presentation on LTAG by the Secretariat, which provided the context and basis by which the various Agenda Items for the Meeting had been set out.

1.5.2 The Honourable Bishop Juan Edghill, Minister of Public Works of Guyana was elected Chairperson of the Meeting. Her Excellency Ms. Aishath Nahula, Minister of Transport and Civil Aviation of Maldives, was elected first Vice-Chairperson, and Ms. Charity Musila, Alternate Representative of Kenya to ICAO was elected second Vice-Chairperson of the Meeting. The opening session was followed by the oral statements delivered by high-level representatives of States and international organizations¹⁰.

1.5.3 From 20 July, the Meeting discussed on the basis of Working Papers (WPs) and Information Papers (IPs) submitted by the ICAO Secretariat, States and international organizations to relevant Agenda Items. The summaries of papers submitted and main views expressed during the discussions were reflected in the Summaries of Discussions (SDs) on respective Agenda Items¹¹. The full Report of the HLM-LTAG is available as ICAO Doc 10178.

1.5.4 Under the Agenda Item 1 (LTAG scenarios and options), all States and organizations expressed the importance of taking action on the existential threat of climate change, and the need for a global long-term objective for international aviation, taking into account different circumstances and readiness levels of States, and the flexibility for each State to contribute to the collective efforts, while also recognizing the necessary means of implementation of an LTAG in the spirit of ICAO's *No Country Left Behind* initiative.

1.5.5 States and organizations expressed their appreciation for the work of ICAO on the feasibility of an LTAG since the last Assembly, in particular the development of the LTAG report. Some delegates, acknowledged that the report was unanimously approved by CAEP, and considered the report to be complete and that no further work was necessary. They agreed that the report should be the basis for considerations on an LTAG at the next Assembly. Other delegates expressed concern, highlighting that CAEP's work had not completed the mandate set out by the ICAO Assembly Resolution A40-18, in particular on the cost impacts to specific regions and developing countries, and the lack of coverage on the assistance to developing countries in meeting any agreed LTAG.

1.5.6 Some delegates highlighted the urgency for ICAO to agree on an ambitious LTAG, expressing the need for the sector to work towards a global goal of net-zero carbon emissions by 2050 with possible intermediate waypoints in 2030 and 2040, in light of the latest consensus scientific understanding by the

⁹ ICAO video for HLM-LTAG opening: https://youtu.be/8fCvQ_Htmqo

¹⁰ Submitted oral statements to HLM-LTAG are available at: <https://www.icao.int/Meetings/HLM-LTAG/Pages/Statements.aspx>

¹¹ All documentation for HLM-LTAG are available at: <https://www.icao.int/Meetings/HLM-LTAG/Pages/Documentation.aspx>

IPCC, and in support of the Paris Agreement's 1.5°C temperature goal. They also acknowledged that the implementation of an LTAG as a global aspirational collective goal should be flexible, without attributing specific emissions reductions goals to individual States.

1.5.7 Other delegates expressed concern over the consideration of net-zero outcomes, noting that the extent of CO₂ emissions reductions through in-sector measures based on the scenarios reflected in the LTAG report would not enable the sector to reach net-zero, and the latest IPCC scientific reports that recognised aviation as a hard to decarbonise sector. They requested developed States to take the lead in attaining net-zero outcomes, before developing States. There was general acknowledgement of views on the interdependency between the level of ambition for an LTAG and the extent of providing the means of implementing an LTAG (which was discussed under Agenda Item 2).

1.5.8 Delegates expressed views on the critical importance of establishing practical means of implementation, including through ICAO State Action Plans (SAPs), strengthening financing support, technology transfer and capacity-building efforts toward the achievement of any agreed LTAG, in support of ICAO's *No Country Left Behind* initiative. Some delegates expressed the view that it would be difficult to agree on an ambitious LTAG, due to the concern on impacts, in particular to developing countries, while others emphasized that an agreed LTAG would provide the opportunity to divert much needed financial support to the sector and provide economic opportunities to developing States.

1.5.9 Under the Agenda Item 2 (means of implementation), there was general support by delegates to the working papers submitted by the ICAO Secretariat. Delegates also supported the ICAO SAPs initiative (refer to paragraph 2 below), facilitating the implementation of robust actions by States in reducing international aviation CO₂ emissions, as well as the establishment of ICAO's partnerships with States and other international organizations for assistance projects for aviation CO₂ emissions reduction measures. Delegates also expressed the view that capacity-building, financing and other assistance to States, in particular to developing countries, would be crucial in ensuring the implementation of any agreed LTAG, recognizing different circumstances of individual States and regions and that not one solution will fit all States and stakeholders.

1.5.10 Some delegates supported the importance for States and relevant stakeholders to work together for the global development and deployment of SAF, LCAF other cleaner energy sources and technologies for aviation, through the ICAO ACT-SAF programme and its possible extension to additional aspects, as a means to provide implementation support for the collective achievement of any agreed LTAG.

1.5.11 Regarding the provision of access to financial resources, there were divergent views expressed by delegates. Some delegates expressed support for ICAO to further facilitate access to financial and investment support by States in the implementation of specific aviation CO₂ emissions reduction measures, taking on a facilitative role to match implementation needs with public or private funding. Other delegates requested the establishment of a specific fund to be managed by ICAO to cover assistance and funding needs of developing States that may not be financed by the private sector, while some delegates expressed concerns that there may be many institutional and legal issues associated with the establishment of such an ICAO fund.

1.5.12 Under the Agenda Item 3 (means of monitoring progress), delegates expressed the view that establishing the means to monitor the progress for the achievement of any agreed LTAG, on a regular basis, and in a non-intrusive and transparent manner, would be important, building upon various existing means to do so, such as the ICAO Stocktaking process and tracker tools as part of monitoring the latest innovations and initiatives for reduction of aviation CO₂ emissions, as well as information from SAPs and the CO₂ reporting mechanism under CORSIA.

1.5.13 Delegates also highlighted the need for continued provision of capacity building and other assistance as well as necessary tools to support the preparation and updates of SAPs, bearing in mind the voluntary nature of SAPs and individual contributions of States to the collective achievement of any agreed LTAG. Some delegates also expressed the need for further assessment of the CO₂ emissions reduction and cost impacts on international aviation, in regions and countries, including the impact on developing

countries. Some delegates emphasized that a continuous monitoring regarding the provision of the means of implementation, in support to delivering the LTAG, should be part of the overall monitoring approach.

1.5.14 Under the Agenda Item 4 (conclusions and recommendations), due to the close inter-linkages between Agenda items 1, 2 and 3, draft conclusions for those Agenda items were discussed as a package of possible outcomes of the HLM-LTAG, taking into account the WPs/IPs submitted, as well as the views expressed on them. Following the exchange of views by the delegates on the possible HLM-LTAG outcomes, the Meeting agreed to recommend the conclusions of the HLM-LTAG¹² (refer to HLM-LTAG-SD/4, Revision 2, and the HLM-LTAG Report, Doc 10178) to be further considered by the ICAO Council for presentation of its proposal to the 41st Session of the ICAO Assembly.

2. STATE ACTION PLANS AND ASSISTANCE

2.1 ICAO State Action Plans Initiative¹³

2.1.1 As requested by Assembly Resolution A40-18, ICAO continues to work together with Member States in order to support the development and update of State Action Plans, thus supporting the implementation of a broad range of CO₂ emissions mitigation measures selected from the ICAO basket of measures. By July 2022, 133 Member States, representing approximately 98 per cent of international aviation traffic, voluntarily submitted action plans to ICAO. These successful results demonstrate the high interest and engagement of Member States in this initiative, as well as the positive impact of ICAO's assistance and capacity-building activities.

2.1.2 The Assembly encouraged States that have already submitted action plans to share information contained in the action plans and build partnerships with other States in order to support those States that have not prepared action plans. In this respect, ICAO has been facilitating the establishment of buddy partnerships between States, including the development of a draft agreement of cooperation aiming to establish a model framework by which States can help other States. To date, nine partnerships have been established under the ICAO State Action Plan Buddy Programme.

2.1.3 The States Action Plans continue to be an essential tool for States to communicate their national plans of climate action for international aviation, while they also serve as an important vehicle for ICAO to monitor the progress for achievement of Member States' collective global aspirational goals. As ICAO has been working on the feasibility of LTAG since the 40th Session of the Assembly (paragraph 1 above refers), several States are recently developing more concrete and longer-term strategies and plans for the reduction of carbon emission from international aviation, with the use of new innovative technologies, operations, and sustainable aviation fuels.

2.1.4 To facilitate the voluntary contributions of States to achieving collective ICAO global aspiration goals, future updates and submissions of State Action Plans should focus on the latest innovative solutions available and should also enable States to leverage potential sources of funding. With the support of States, the Secretariat aims to update the ICAO Doc 9988, *Guidance on the Development of State Action Plans on CO₂ Emissions Reduction Activities*, to ensure State Action Plans become more robust, more quantitative, more forward-looking, while being an effective tool for facilitating green financing through fully quantified environmental benefits of the action plans.

2.2 ICAO-European Union (EU) Assistance Project

2.2.1 The ICAO-EU assistance project has been a successful environmental initiative, funded by the EU and implemented by ICAO from 2014 to 2019, supported 14 beneficiary States in Africa and the Caribbean with the development and implementation of State Action Plans, and the establishment of CO₂ emissions monitoring systems for international aviation. All the beneficiary States developed and submitted

¹² A request was received by China to register their reservation to the conclusions of the HLM-LTAG.

¹³ ICAO State Action Plans website: https://www.icao.int/environmental-protection/Pages/ClimateChange_ActionPlan.aspx

fully quantified Action Plans, and established National Action Plan Teams with relevant stakeholders to oversee their implementation. An Aviation Environmental System (AES) was installed in each State as a tool to monitor CO₂ emissions from international aviation and pilot projects for providing solar energy to power at gates at airports and SAF production feasibility studies were implemented.

2.2.2 Building on the successful partnership, Phase II of the ICAO-EU assistance project was launched for ICAO to support an additional 10 beneficiary States in Africa on the development of their State Action Plans during an implementation period from 2020 to 2023. As part of the Phase II project, by June 2022, all Action Plans were already developed and a series of initiatives, such as an information session with the participation of Directors General of Civil Aviation of the beneficiary States, and an innovation seminar, were held focusing on facilitating the development and deployment of SAF.

3. COOPERATION WITH OTHER BODIES

3.1 ICAO continued to cooperate with other United Nations (UN) bodies and international organizations involved in policy making on climate change, notably with the United Nations Framework Convention on Climate Change (UNFCCC) process. While emissions from international aviation and maritime sectors are not included as part of the Nationally Determined Contributions (NDCs) under the UNFCCC Paris Agreement, these are separately addressed by ICAO and the International Maritime Organization (IMO), respectively, to complement the achievement of the Paris Agreement goals. In this regard, ICAO regularly delivered statements and written submissions, and organized and participated in relevant meetings and side events during the UNFCCC conferences¹⁴, with the aim of maintaining ICAO's leadership role in all issues related to international aviation and climate change.

3.2 Of note is that the Glasgow Climate Pact, which was adopted by COP26 conference 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”¹⁵. 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”¹⁶.

3.3 ICAO also continued to keep abreast of developments in other UN bodies, including IMO, Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization (WMO), United Nations Environment Programme (UNEP), World Health Organization (WHO) and UN Environment Management Group (EMG). With its Carbon Emissions Calculator, the ICAO Secretariat has been playing a key role through constant support to other UN organizations to estimate the air-travel related portion of GHG inventories, as part of the UN sustainability management strategy.

3.4 On the International Civil Aviation Day on 7 December 2020, the UN Secretary-General welcomed the commitments to net-zero emissions made by members of the aviation community, and urged the entire sector to commit to net zero by 2050¹⁷. In addition, on the International Civil Aviation Day on 7 December 2021¹⁸, the UN Secretary-General highlighted that current climate commitments by the aviation sector are not aligned with the 1.5°C temperature goal, and adopting a new set of ambitious targets that commit to net zero by 2050, with interim goals and credible implementation plans, must be an urgent priority for the next ICAO Assembly.

— END —

¹⁴ ICAO outreach at UNFCCC COP26 (November 2021): <https://www.icao.int/environmental-protection/Pages/cop26.aspx>

¹⁵ Paragraph 15 of the Glasgow Climate Pact: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

¹⁶ Paragraph 16 of the Glasgow Climate Pact: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

¹⁷ <https://www.icao.int/Newsroom/Pages/UNSG-MESSAGE-ON-INTERNATIONAL-CIVIL-AVIATION-DAY.aspx>

¹⁸ <https://press.un.org/en/2021/sgsm21060.doc.htm>