

International Civil Aviation Organization

INFORMATION PAPER (IP/02)



ICAO

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THIRTIETH MEETING OF THE METEOROLOGY
SUB-GROUP (MET SG/30)

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Agenda Item 9: Environmental-Related Initiatives and Impacts**ICAO ENVIRONMENTAL PROTECTION AND AIR NAVIGATION PLANNING
INITIATIVES: RELEVANCE TO AERONAUTICAL METEOROLOGY**

(Presented by the Secretariat)

SUMMARY

This paper provides information on ICAO environmental protection and air navigation planning initiatives, including the ICAO Strategic Plan 2026–2050, the Long-Term Global Aspirational Goal (LTAG), State Action Plans (SAPs), the Global Air Navigation Plan (GANP), and National Air Navigation Plans (NANPs). The paper highlights linkages between environmental protection and air navigation planning activities. It discusses their relevance to the MET SG Terms of Reference, particularly the sharing of aviation meteorological initiatives being undertaken to reduce the environmental impact of aviation operations and information on the impacts of climate change on aviation operations.

1. INTRODUCTION

1.1 ICAO serves as a multilateral platform for cooperation on international aviation environmental protection. ICAO Member States have agreed to focus environmental protection activities on climate change and aviation emissions, aircraft noise, and local air quality. ICAO has also adopted a Long-Term Global Aspirational Goal (LTAG) of net-zero carbon emissions from international aviation by 2050.

1.2 ICAO recognises its responsibility, together with its Member States, to achieve maximum compatibility between the safe and orderly development of civil aviation and the quality of the environment. ICAO policies seek to limit or reduce the impact of aviation greenhouse gas emissions on the global climate, limit or reduce aviation impacts on local air quality and aircraft noise and ensure future resilience of air transport by adapting its infrastructure and operations to the consequences of climate change.

1.3 The ICAO Strategic Plan 2026–2050 identifies “Aviation is Environmentally Sustainable” as one of ICAO’s Strategic Goals. The Strategic Plan highlights the importance of improving operational efficiency, advancing digitalisation, accommodating future growth and ensuring that no country is left behind.

1.4 ICAO also maintains global, regional and national planning frameworks for the development and implementation of air navigation systems, including the Global Air Navigation Plan (GANP), Regional Air Navigation Plans (ANPs), and National Air Navigation Plans (NANPs). These initiatives provide an important planning framework for the implementation of air navigation improvements while supporting broader ICAO objectives.

2. DISCUSSION

ICAO environmental protection and air navigation planning

2.1 The Global Air Navigation Plan (GANP) is ICAO's strategic plan for the evolution of the global air navigation system. The GANP states that its purpose is to accommodate all airspace users in a safe, secure and cost-effective manner while reducing the environmental impact of aviation. The GANP also provides a framework for alignment between global, regional and national planning activities.

2.2 Assembly Resolution A42-6 recognises the importance of the GANP as an operational strategy and as part of the basket of measures to achieve ICAO's global aspirational goals on CO₂ emissions. The Resolution also calls upon States to take into consideration GANP guidance when implementing operational improvements as part of national strategies to reduce the environmental impact of international aviation.

2.3 ICAO Assembly Resolution A42-20 recognises that many of the adverse environmental effects of civil aviation activity can be reduced through a range of measures, including technological improvements, more efficient air traffic management and operational procedures. The Resolution further recognises that airspace management and design can play a role in addressing the impacts of aviation greenhouse gas emissions on the global climate.

2.4 A42-20 also requests the Council to disseminate information on aviation environmental impacts, trends and mitigation measures, including information related to the GANP, ICAO Standards and Recommended Practices (SARPs), and ICAO environmental policies and guidance material.

2.5 Regional ANPs and NANPs support implementation of the GANP by identifying the facilities, services, operational improvements and capabilities required to meet agreed planning objectives. ICAO guidance for the development of NANPs identifies environmental assessment as one of the considerations when evaluating implementation options and operational improvements. Guidance on environmental assessment of proposed ATM operational changes further notes that environmental assessment principles may support implementation of GANP initiatives, State Action Plans and other sustainable aviation initiatives.

State Action Plans and national implementation

2.6 ICAO encourages States to voluntarily prepare State Action Plans (SAPs) on CO₂ emissions reduction activities. SAPs identify measures that States intend to implement to reduce emissions from international aviation and provide a framework for reporting and monitoring these activities.

2.7 ICAO's environmental programme promotes a comprehensive "basket of measures" consisting of technology and standards, sustainable aviation fuels and cleaner energies, operational improvements, and market-based measures. Assembly Resolution A42-21 reaffirmed the importance of progressing all elements of this basket of measures in support of ICAO's climate-change objectives and LTAG implementation.

2.8 Assembly Resolution A42-21 notes that substantial capacity-building and technical assistance activities have been undertaken to support the preparation and submission of State Action Plans, including guidance material, regional seminars and supporting tools. The Resolution welcomes the widespread voluntary participation of States in the SAP programme. It encourages States to submit and periodically update Action Plans outlining policies, actions and roadmaps to reduce CO₂ emissions from international aviation.

2.9 ICAO guidance also notes that State Action Plans play an important role in monitoring progress towards achievement of the LTAG through the reporting of national policies, actions, roadmaps and expected environmental benefits.

Relevance to aeronautical meteorology

2.10 Meteorological services form part of the air navigation system and support the safe, regular and efficient conduct of international aviation. The MET SG Terms of Reference include sharing information on aviation meteorological initiatives being undertaken to reduce the environmental impact of aviation operations and sharing information on the impacts of climate change on aviation operations.

2.11 ICAO guidance on operational opportunities to reduce fuel burn and emissions notes that operational measures have the potential to provide substantial near-term reductions in fuel consumption and emissions and that many such opportunities require collaboration among aviation stakeholders. ICAO guidance also recognises the importance of meteorological information in supporting flight planning and operational decision-making.

2.12 ICAO guidance identifies opportunities for environmental improvements through efficient ATM operations, flight planning and route optimisation, including consideration of meteorological conditions in flight planning and route selection.

2.13 ICAO Assembly Resolution A42-21 recognises the importance of identifying the potential impacts of climate change on international aviation operations and related infrastructure, together with options for adaptation measures. Assembly Resolution A42-20 also recognises the importance of a resilient air transport system that can adapt its infrastructure and operations to a changing climate. Recent ICAO work has included climate adaptation studies and assessments relating to the effects of climate change on international aviation operations and infrastructure.

2.14 ICAO environmental work additionally includes ongoing consideration of operational opportunities to reduce non-CO₂ climate effects, including contrails and aviation-induced cirrus, together with associated operational and environmental interdependencies. These subjects may be of interest to the aeronautical meteorology community because of their dependency on atmospheric conditions and meteorological information.

Role of the MET SG

2.15 The MET SG provides a forum for States and international organisations to exchange information relevant to its Terms of Reference, including aviation meteorological initiatives being undertaken to reduce the environmental impact of aviation operations and information on the impacts of climate change on aviation operations.

2.16 The exchange of information on regional experiences, research, operational developments and implementation initiatives may assist States in understanding relevant ICAO environmental protection and air navigation planning initiatives, including those associated with the ICAO Strategic Plan, SAPs, GANP implementation and national planning activities. Such exchanges

may support broader ICAO objectives relating to environmental sustainability, climate-change adaptation and operational efficiency.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to note the information contained in this paper.
