



ORGANISATION DE L'AVIATION  
CIVILE INTERNATIONALE

INTERNATIONAL CIVIL  
AVIATION ORGANIZATION

## Evaluation of ICAO's Environmental Protection Strategic Objective

EV/2025/01

Office of Internal Oversight



Prepared by: Gugsu Yimer Farice, Evaluation Specialist  
Carlued Leon, International Consultant

Reviewed and  
approved by: Malika Mukhitdinova (Chief, OIO)

Draft issued: 24 January 2025

Action plan completed: 28 April 2025

Final report issued: 29 April 2025

## ACRONYMS

ACI	Airports Council International
ACT	Assistance, Capacity-building and Training
ADB	Administration and Services Bureau
AFCAC	African Civil Aviation Commission
ANB	Air Navigation Bureau
APAC	Asia and Pacific Region
ATAG	Air Transport Action Group
ATB	Air Transport Bureau
A-WP	Assembly Working Paper
CAEP	Committee on Aviation Environmental Protection
CAAF	Conference on Aviation Alternative Fuels
CANSO	Civil Air Navigation Services Organization
CCR	CORSIA Central Registry
C-DEC	Council Decision
CDI	Capacity Development and Implementation Bureau
CEC	Climate and Environment Committee
CNG	Carbon Neutral Growth
CO	Carbon Monoxide
COP21	UN Climate Change Conference
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
C-WP	Council Working Paper
DAC	OECD Development Assistance Committee
EASA	European Union Aviation Safety Agency
ENV	Environment Branch
EPI	Environmental Protection Index
ESAF	Eastern and Southern African Region
EU	European Union
EUR/NAT	European and North Atlantic Region
GANP	Global Air Navigation Plan
GASeP	Global Aviation Security Plan
GASP	Global Aviation Safety Plan
GAT	Global Aviation Training
HC	Hydrocarbons
HQ	Headquarters
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization

ICCAIA	International Coordinating Council of Aerospace Industries Associations
IPCC	Intergovernmental Panel on Climate Change
IUNC	International Union for Conservation of Nature
LEB	Legal Affairs and External Relations Bureau
LACAC	Latin American Civil Aviation Commission
LCAF	Lower Carbon Aviation Fuels
LTAG	Long-Term Global Aspirational Goal
MID	Middle East Region
MRV	<sup>1</sup> A40-WP/411; A40-WP/194; A40-WP/102; A40-WP/56; A40-WP/193; A40-WP/194; C-WP/15587.
NACC	North American, Central American and Caribbean Region
NCLB	No Country Left Behind
NOx	Oxides of Nitrogen
nvPM	Non-Volatile Particulate Matter
OECD	Organisation for Economic Co-operation and Development
OIO	Office of Internal Oversight
OSG	Office of the Secretary General
RO	Regional Office
RTK	Revenue Tonne Kilometer
SAF	Sustainable Aviation Fuel
SAM	South American Region
SAP	State Action Plan
SARP	Standards and Recommended Practices
SDG	Sustainable Development Goal
SO	Strategic Objective
TOR	Terms of Reference
UN	United Nations
UNEG	United Nations Evaluation Group
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WACAF	Western and Central African Region
WMO	World Meteorological Organization

## TABLE OF CONTENTS

ACRONYMS.....	1
TABLE OF CONTENTS .....	3
EXECUTIVE SUMMARY .....	1
INTRODUCTION AND BACKGROUND .....	4
Introduction .....	4
Background.....	4
EVALUATION PURPOSE AND METHODOLOGY .....	6
Evaluation Purpose & Scope.....	6
Evaluation Methodology .....	6
Data Analysis and Quality Assurance .....	7
Ethical Considerations .....	7
Limitations .....	8
FINDINGS.....	9
Relevance.....	9
Coherence .....	13
Effectiveness.....	16
Efficiency.....	29
Sustainability .....	36
CONCLUSIONS AND RECOMMENDATIONS.....	41
Conclusions.....	41
Recommendations .....	42
ANNEX 1. METHODOLOGY .....	I
ANNEX 2. LIST OF STAKEHOLDER RECOMMENDATIONS.....	VI
ANNEX 3. LIST OF CONSULTED STAKEHOLDERS .....	VIII
ANNEX 4. DATA COLLECTION TOOLS.....	XI
Interview Guide for Member States .....	xi
Interview Guide for ICAO Staff .....	xii
Interview Guide for ICAO Partners/Other Stakeholders .....	xiv
Member States Survey.....	xv
ANNEX 5. SURVEY FINDINGS BY ICAO REGION.....	XXVIII
ANNEX 6: THEORY OF CHANGE .....	L
ANNEX 7: MANAGEMENT ACTION PLAN .....	LI



## EXECUTIVE SUMMARY

---

1. The 2024 Work Programme of the Office of Internal Oversight includes the Evaluation of the ICAO's Environmental Protection Strategic Objective. The objective of the evaluation was to assess the relevance, coherence, effectiveness, efficiency and sustainability of the ICAO projects and activities conducted under the Strategic Objective of Environmental Protection.
2. The evaluation covered activities delivered by ICAO from January 2017 until July 2024, with a focus on key activities and outputs in the three core areas of Environmental Protection: climate change and aviation emissions, aircraft noise, and local air quality.
3. The primary beneficiaries of the evaluation are the Air Transport Bureau (ATB), Office of the Secretary General (OSG), the Capacity Development and Implementation Bureau (CDI), Regional Offices, the ICAO Council and Member States. Other stakeholders such as the industry and ICAO partners can also use the evaluation findings, as appropriate. The evaluation was carried out between May and December 2024.

### Key Findings and Conclusions

4. Overall, Member States are satisfied with ICAO's standard-setting, monitoring and implementation support work around environmental protection to support their needs. Stakeholders highlighted the work of the Committee on Aviation Environmental Protection (CAEP) and the Climate and Environment Committee (CEC) in ensuring the high quality of ICAO's environmental protection efforts and initiatives.
5. The Long-Term Global Aspirational Goal (LTAG) and Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) are considered ICAO's top achievements across all areas of environmental protection. Other important accomplishments include the Sustainable Aviation Fuel (SAF) and the Conference on Aviation Alternative Fuels (CAAF)/3 in the area of climate change; Standards and Recommended Practices (SARPs) related to non-volatile Particulate Matter and Nitrogen Oxides regarding local air quality; and Chapter 14 SARPs in Annex 16 Volume I in relation to noise abatement.
6. ICAO's implementation support work and programmes are effective in assisting Member States to achieve their environmental protection goals. The State Action Plan (SAP)-related assistance and Assistance, Capacity-building and Training (ACT)-CORSIA are considered the most effective capacity-building initiatives. ACT-SAF is perceived as more difficult to utilize due to the technical and operational intricacies of working with SAF.
7. ICAO's monitoring of the implementation of Annex 16 SARPs has been generally adequate. Areas for improvement include stronger monitoring of SAP implementation and progress toward LTAG. Regarding the auditing of Annex 16, there was a nearly even split between States in favor of a full or partial audit and States against such approach.
8. ICAO communication and dissemination of information among aviation stakeholders on its environmental protection initiatives, programmes and achievements are considered successful. However, its external communication with key non-aviation stakeholders—including other UN

agencies and the wider public—falls short in relaying the real environmental impact of aviation and the efforts and contributions of the aviation sector to environmental protection.

9. Given the increasing expansion of work to new environmental topics such as SAF and non-CO<sub>2</sub> emissions, as well as the increasing demand for support by Member States ICAO's current organizational structure presents challenges to sustain high-quality support to Member States and to scale up the environmental protection work.
10. The quality of ICAO's technical expertise in environmental protection to support Member States at the regional and global levels is considered high. Yet, the quantity and allocation of ICAO's financial and human resources to achieve its environmental protection goals is not adequate. Stakeholders raised concerns around staff burnout as a by-product of limited internal resources in the Organization.
11. Member States highly rated ICAO's capacity-building activities and programmes to support national-level implementation and cross-state partnerships for environmental protection. However, limited involvement of other ICAO functions—such as CDI and GAT—and a perceived passive engagement of the Regional Offices were mentioned as barriers to greater implementation support.
12. ICAO's work activities have enabled the adoption of national-level environmental policies and regulatory frameworks in the area of civil aviation. Yet, State-level limitations related to cross-sectoral coordination, technical capacity and human resources were considered important barriers to sustaining current progress.
13. The use of voluntary contributions, secondments and the Finvest Hub initiative are relevant approaches to financially support ICAO's environmental protection work. However, a revision of the organization's regular budget is proposed as critical measure to sustain the increasing amount and level of urgency of the environmental protection work.

## Recommendations

14. Based on the findings and conclusions, the evaluation outlined the following five recommendations:
  - Review and revise the structure of ICAO's Environment Branch and, while ensuring the maintenance of the technical integrity of the work, determine the optimal organizational design to deliver on the environmental protection work, taking into account the existing and emerging areas.
  - Develop a monitoring mechanism for SAP implementation. This mechanism should be aligned with and complement other methodologies already developed to monitor progress toward LTAG. To the extent possible, this monitoring mechanism should provide ICAO with greater visibility into the status of SAP implementation while allowing reporting flexibility to avoid overburdening States with stringent requirements.
  - Develop and implement an action plan to improve the financial and human resources for the Environmental Protection Strategic Objective. This should include assessing and strengthening resource gaps at ICAO Headquarters as well as in Regional Offices for more effective implementation support to the States.
  - Develop and implement a comprehensive external communication plan/mechanism on the environmental impacts of aviation and contributions of ICAO to environmental protection. To the extent possible, this work should leverage existing communication resources developed by ICAO partners.



- Develop a comprehensive stakeholder engagement and strategic partnerships mechanism for Regional Offices to facilitate sector-wide work coordination and leverage their position as UN representatives to enable the active participation of aviation and non-aviation stakeholders in the environmental protection work.

## INTRODUCTION AND BACKGROUND

---

### Introduction

15. The 2024 Work Programme of the Office of Internal Oversight (OIO) includes the Evaluation of the ICAO's Environmental Protection Strategic Objective (SO). The evaluation was undertaken in accordance with the OIO Charter (C-WP/15115) and the ICAO Evaluation Policy (C-WP/15269).
16. The objective of the evaluation was to assess the relevance, coherence, effectiveness, efficiency and sustainability of the ICAO projects and activities conducted under the Strategic Objective of Environmental Protection. The evaluation aims to enhance accountability by providing evidence of institutional performance. It is also intended to be forward-looking and contribute to organizational learning and decision-making by providing lessons learned and recommendations for improvement.
17. The evaluation was conducted in adherence to the Norms and Standards for Evaluation in the United Nations System approved in 2016 by the United Nations Evaluation Group (UNEG).

### Background

18. Climate change has been one of the major global issues tackled by the United Nations for the past decades. The Paris Agreement to attempt to maintain a rise in global average temperature at or below 1.5 degrees Celsius above pre-industrial levels was adopted at the UN Climate Change Conference (COP21) in 2015. The aviation sector accounts for less than 2 percent of global greenhouse gas emissions, and it is expected to increase, if action is not taken to reduce emissions<sup>1</sup>.
19. ICAO began tackling issues related to aviation and climate change in the 1990s amid public concerns about climate change. Work on environmental protection started in the 1960s, focusing first on noise and the Committee on Aircraft Noise was established in 1970, followed by the Committee on Aircraft Engine Emissions in 1977. These two committees were merged in 1983 to form the existing technical (AEP established by the Council to assist in developing new policies and SARPs related to environmental protection.
20. The environmental programme of ICAO grew larger in scope with the coming into force of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. ICAO focused its work on the prominent effects of international aviation and climate change and expanded its cooperation with other UN bodies on greenhouse gas emissions issues, while continuing to deal with an expanding list of noise and local air quality issues. In 1999, at ICAO's request, the Intergovernmental Panel on Climate Change (IPCC) prepared the *Special Report on Aviation and the Global Atmosphere*, which assessed the global impact of aircraft engine emissions.<sup>2</sup> Since then, environmental protection became one of the Strategic Objectives of ICAO and its work concentrates on three core areas: aircraft noise, aviation emissions that affect local air quality and climate change.
21. Regarding noise abatement, ICAO set standards related to aircraft noise certification in Volume I of Annex 16. ICAO also offers guidelines for land use planning and management, providing various

---

<sup>1</sup> [Climate Action Tracker \(2020\)](#)

<sup>2</sup> [IPCC Special Report on Aviation and the Global Atmosphere \(IPCC, 1999\)](#)

devices and good practices that Member States can apply to minimize the impact of aircraft noise in the vicinity of airports.

22. In the area of local air quality, Volume II of Annex 16 sets standards for aircraft emissions certification on liquid fuel venting, smoke and the main gaseous exhaust emissions related to local air quality except for CO<sub>2</sub>, such as hydrocarbons, oxides of nitrogen and carbon monoxide. In addition, to control the emissions of volatile particulate matter by gaseous emission certification, ICAO has adopted certification standards for emissions of non-volatile particulate matter to further reduce emissions of harmful substances from aircraft.
23. To minimize the adverse effects of international civil aviation on the global climate, ICAO formulates policies and develops and updates SARPs, guidance and tools related to aircraft emissions. To achieve the medium-term global aspirational goal of Carbon Neutral Growth (CNG2020), adopted by the 37<sup>th</sup> ICAO Assembly in 2010, and to promote sustainable growth of international aviation, ICAO is pursuing a basket of measures including aircraft technology improvements (e.g. adoption of new aeroplane CO<sub>2</sub> certification standards in Volume III of Annex 16 in 2017), operational improvements, sustainable aviation fuels and the implementation of a global market-based measure for decarbonization (CORSIA), adopted by the 39<sup>th</sup> ICAO Assembly in 2016 (e.g. adoption of CORSIA implementation standards in Volume IV of Annex 16 in 2018, and subsequent decisions on other implementation elements).
24. In 2022, the 41<sup>st</sup> ICAO Assembly adopted the collective long-term global aspirational goal for international aviation LTAG of net-zero carbon emissions by 2050. Recognizing the significant contributions of SAF and aviation cleaner energies to achieving LTAG, the CAAF/3 in 2023 adopted the ICAO Global Framework to facilitate the global scale-up on the development, production and deployment of SAF and aviation cleaner energies. The ICAO Roadmap for the implementation of the CAAF/3 Global Framework and the LTAG was approved by the Council in June 2024.
25. ICAO also provides diverse types of assistance, capacity-building, and training programmes for Member States to implement policies, SARPs and guidance related to environmental protection in line with ICAO's No Country Left Behind (NCLB) initiative. In 2010, following the adoption of the CNG2020, ICAO launched the State Action Plan (SAP) initiative to assist Member States in developing and implementing policies for reduction of CO<sub>2</sub> emissions. ICAO's Assistance, Capacity-building and Training for CORSIA (ACT-CORSIA) programme was launched in 2018 to facilitate the implementation of CORSIA by all States, ensuring the achievement of CNG2020.<sup>3</sup> In addition, ICAO's ACT-SAF<sup>4</sup> programme was launched in 2022 to offer tailored assistance to Member States for the development and deployment of SAF and aviation cleaner energies toward the achievement of LTAG. Furthermore, ICAO has been closely working with other international bodies to provide support to Member States around implementation and capacity building to contribute to the achievements of the Sustainable Development Goals (SDG), in particular SDG 7 and SDG 13.<sup>5</sup>

---

<sup>3</sup> [Environmental Protection Report – Chapter 6 \(ICAO, 2019\)](#)

<sup>4</sup> [AFI Aviation Symposium – Session 6: Environmental Protection, LTAG & CAAF \(ICAO, 2023\)](#)

<sup>5</sup> [ICAO and the United Nations Sustainable Development Goals](#)

## EVALUATION PURPOSE AND METHODOLOGY

---

### Evaluation Purpose & Scope

26. This evaluation aimed to serve dual objectives: accountability and learning.

- Accountability by independently assessing progress made over the years across key areas of ICAO's Environmental Protection Strategic Objective. More specifically, the evaluation assessed the performance, strategies, implementation modalities, constraints and opportunities.
- Learning by identifying good practices and lessons learned and providing recommendations to improve performance and delivery of results.

27. The evaluation covered strategic activities and outputs delivered by ICAO from January 2017 until July 2024, with a focus on key activities and outputs in the three core areas of Environmental Protection: climate change and aviation emissions, aircraft noise abatement and local air quality. As it was designed to be high level, the evaluation did not delve into the specific details of ICAO's activities or the achievements of its Member States. It primarily concentrated on the work, programmes and activities conducted by ICAO under the Environmental Protection Strategic Objective. As such, the evaluation was not intended to assess the integration or mainstreaming of environmental considerations into ICAO's broader work and operations.

28. The primary clients of the evaluation are ATB, CDI, ROs, OSG, the ICAO Council and Member States. Other stakeholders such as the industry and other ICAO partners can use the evaluation findings, as appropriate.

### Evaluation Methodology

29. The evaluation employed a mixed-methods approach combining quantitative and qualitative research elements to triangulate findings and provide a comprehensive understanding of ICAO's achievements around environmental protection. Annex 1 provides a detailed description of the methodology.

30. The evaluation was guided by 16 questions following the Organization of Economic Development (OECD) Development Assistance Committee (DAC) criteria, as presented in Annex 1.

31. The evaluation adopted a participatory approach involving key stakeholders—such as the ICAO Council, the Secretariat, Member States, industry partners, and other relevant stakeholders—across the different evaluation stages, including the inception, data collection and report review phases.

### Data Collection

32. The evaluation employed the following data sources:

- **Desk review:** The evaluation team reviewed and analyzed a wide range of documents, including ICAO's SARPs, policies, guidance materials, manuals, Council working papers (C-WPs), Operating Plans, project monitoring reports, ICAO Business Plans, environment reports, and other relevant documents.
- **Online survey:** The evaluation administered an online survey targeting all Member States to gather their views on ICAO's normative, monitoring/auditing and implementation support work related

to environmental protection over the past 7.5 years. A total of 112 Member States participated in the online survey (58% of all ICAO Member States). Across ICAO Regions, 22 APAC States, 13 ESAF States, 36 EUR/NAT States (35 States plus one survey completed by the European Union as a regional block), 6 MID States, 11 NACC States, 13 SAM States and 11 WACAF States participated in the survey. Annex 4 includes the survey instrument.

- **In-depth interviews:** The evaluation team interviewed 95 stakeholders through 53 semi-structured in-depth discussions, including Council President and Members, the ICAO Secretary General, Member States, ICAO Bureau Directors, RO Directors and their Deputies, CAEP Chair and Members, relevant ICAO staff, industry partners and regional organizations, among others. Annex 2 includes the list of stakeholders interviewed and Annex 4 includes the questionnaires that guided these interviews.

Table 1. Stakeholder Consultations

Stakeholders	Consultation Method	
	No. of Interviewees	Online Survey (Response Rate)
Member States	45	112 (58%)
Council Members	10	-
ICAO Staff (HQ and ROs)	30	-
Industry	7	-
Regional Groups/Organizations	3	-
Total	95	112

## Data Analysis and Quality Assurance

33. The evaluation team conducted descriptive and content analysis to identify and validate findings. Descriptive analysis was specifically used for online survey responses, data extracted from ICAO databases and other data derived from the desk review. For result interpretation purposes, answer options 'high' and 'moderate' were aggregated and reported. Content analysis was employed on the information collected through the desk review and in-depth interviews to identify major themes.
34. The information collected through primary and secondary sources was systematically analyzed, cross-referenced and triangulated to validate findings. Similar questions were asked across stakeholders to compare responses and verify information.

## Ethical Considerations

35. The assessment abided by the UNEG Ethical Guidelines for Evaluation. Special care was given to the storage of documents, interview notes and the confidentiality of the data collected for this evaluation. The identity of participants has been preserved in the presentation of findings, as only aggregate-level results are reported.

36. This evaluation was independently carried out by OIO, with the assistance of an independent consultant. All evaluation team members declared no conflict of interest.

### Limitations

37. Relative to other ICAO workstreams such as safety and security, ICAO's work around environmental protection has grown importantly over the past two to three years, with significant developments taking place even in the past few months. As such, the results of some activities, mechanisms and tools implemented by ICAO to support the aviation sector in advancing environmental protection may have not fully materialized yet (e.g. the roadmap for the implementation of the CAAF/3 outcomes) or may be too incipient for the evaluation to fully assess their level of contribution. Wherever possible, the evaluation team noted actions already taken by ICAO to address any challenges identified in this report.
38. Following UNEG evaluation guidelines, the evaluation design included questions on the mainstreaming of gender and human rights considerations into ICAO's environmental protection work. However, given that ICAO's mandate primarily focuses on the technical and operational aspects of international civil aviation rather than direct socioeconomic outcomes, it is not possible for the evaluation team to assess direct linkages between ICAO's environmental protection work and gender/human rights results. Wherever possible, the evaluation highlighted ICAO's efforts to ensure inclusivity and equity in its decision-making processes and stakeholder engagement as indicators of indirect contributions to broader UN goals.

## FINDINGS

---

39. This section presents the main findings of the evaluation focusing on the relevance, coherence, effectiveness, efficiency and sustainability of ICAO's environmental protection work. Annex 5 includes key findings disaggregated by ICAO Regions.

### Relevance

**Finding 1:** ICAO's Annex 16 SARPs, policies and strategies are highly relevant to achieve ICAO's Environmental Protection Strategic Objective and to respond to Assembly Resolutions related to environmental protection. Stakeholders highlighted the work of the CAEP and the CEC in ensuring the high quality of ICAO's environmental protection efforts and initiatives. While the CAEP and the CEC have been largely successful in protecting environmental work from political influences, stakeholders recommended reinforcing its current consensus- and technical data-driven approach.

40. Member States considered Annex 16 SARPs pertinent to achieve ICAO's environmental protection goals. The survey showed that 94% of States rated Volumes III and IV of Annex 16 SARPs as relevant to achieving key global aspirational goals for international aviation, including LTAG (Figure 1). Similarly, about 86% of States assessed Volumes I and II as appropriate to achieve key objectives around noise abatement and local air quality. Across ICAO Regions, ratings were similar except for APAC States, which rated the relevance of Volumes I and II lower (70% and 65%, respectively).
41. When asked about ICAO's standard-setting process related to environmental protection, most stakeholders highlighted Annex 16 as a key success in establishing a harmonized set of rules with global applicability.<sup>6</sup> Stakeholders specifically stressed the relevance of the four volumes of Annex 16 in balancing the science and the realities and needs of the aviation sector.

*"Annex 16 SARPs and all related work, like SAPs and CORSIA, have prevented unilateral state actions. For example, [other ICAO Regions] wanted to impose their own taxes on emissions, but ICAO led the international community towards a global framework."*

MID Member State

*"The advancement of Annex 16 SARPs is vital at the national level because it helps us draft legislation. For instance, Annex 16 Volume 4 for CORSIA has been critical for us to establish requirements for airlines."*

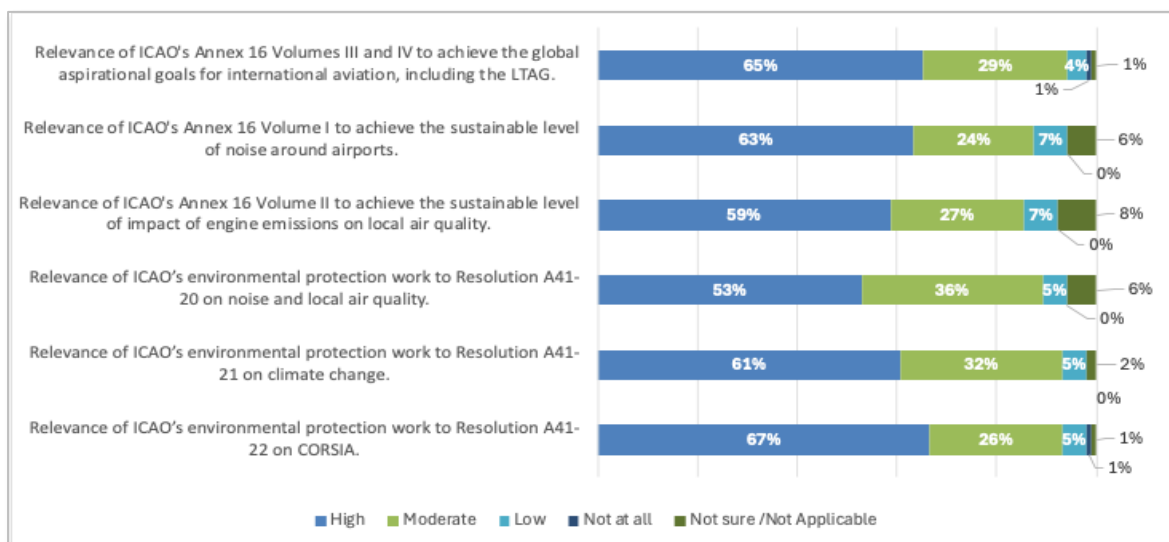
APAC Member State

42. On average, 92% of States found ICAO's environmental protection work and activities to be relevant to respond to Assembly Resolutions A41-20 on noise and local air quality (89%), A41-21 on climate change (93%) and A41-22 on CORSIA (93%) (Figure 1). Results were similar across ICAO Regions except for APAC States, which rated the relevance of ICAO's work to the Resolutions on noise abatement and local air quality lower (79%).

---

<sup>6</sup> A40-WP/159

Figure 1. Perception of Member States on the Relevance of ICAO's Annex 16 SARPs



Source: Survey on Environmental Protection Strategic Objective

43. Many stakeholders underscored the high level of politicization of the environmental protection work and the successful work of the CAEP and the CEC in keeping political influences largely at bay. For instance, one stakeholder shared: "Independent expert groups give us information on new technology and then ICAO considers relevant standards based on that. CAEP has done amazing work in setting standards for carbon offsetting, which was not conceivable 10 years ago. It is doing the same for SAF." Stakeholders generally thought that only by relying on robust, evidence-based research, ICAO can ensure the development of policies and standards that balance environmental sustainability with the industry's growth needs and maintain credibility in addressing global aviation's environmental impacts. As such, stakeholders recommended ICAO to reinforce its current consensus and technical data-driven approach to standard-setting whenever politics get difficult.

*"CAEP has done high quality technical work, especially on CORSIA-related SARPs and MRV system, criteria for SAF and criteria for emission reporting. CAEP is trusted to provide independent and comprehensive advice to the Council."*

APAC Member State

*"Above all, SARPs must be consensus- and science-based. This work can get too political, so it needs to stay focused on the science and what we all agree we can do—not just what one region or one State wants to do."*

NACC Member State

44. When asked about the balance of the standard-setting work across the three areas of environmental protection, stakeholders agreed that most efforts are centered around aviation emissions and climate change.<sup>7</sup> Some interviewees considered this 'imbalance' as reasonable given the urgency of global warming, while other stakeholders thought ICAO should give more attention to the work around noise abatement and local air quality as well. For instance, a Council Member shared: "The pressure is on

<sup>7</sup> A40-WP/55; A40-WP/57



climate change. It is normal that we move resources to the biggest priorities. Net zero by 2050 can only be achieved with SAF, so ICAO needs to deploy all resources there. Otherwise, we risk not showing results and losing credibility," whether others highlighted challenges from these imbalances, as noted in the comments below.

*"There is urgency about climate change, so there is not necessarily equal balance and this is ok, but you do need to keep a close eye on the minimum of work in the other areas. Not having a noise technical officer for 2 years has been an issue and shows some imbalance."*

Industry Partner

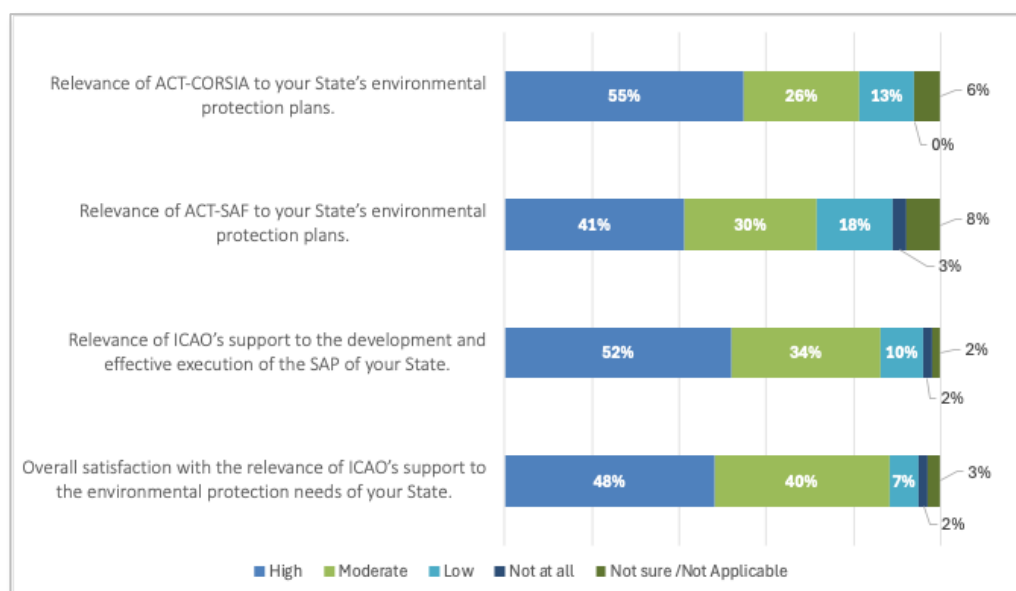
*"In the area of climate change, ICAO is doing well. But the topic of local air quality should receive more attention. Pollution is a big problem for us during the winter. We need more guidance and materials to implement work around local air quality."*

SAM Member State

**Finding 2:** SAP, ACT-CORSIA and ACT-SAF are highly relevant programmes to assist Member States in overcoming implementation challenges and meeting their environmental protection plans and needs. Most stakeholders perceive the programmes as critical to achieving key ICAO environmental protection goals, including LTAG.

45. Almost 90% of Member States found ICAO's implementation support to be relevant to their environmental protection needs and plans, particularly the State Action Plans and ACT-CORSIA.<sup>8</sup> The pertinence of the SAPs (86%) and ACT-CORSIA was rated the highest (81%), whereas the relevance of ACT-SAF was assessed as lower (72%) (Figure 2). Across ICAO Regions, the pertinence of ACT-SAF to the States' environmental protection plans was generally rated lower in MID (67%), NACC (64%) and SAM (62%). These findings are consistent with results from the in-depth interviews, where stakeholders mentioned the SAPs and ACT-CORSIA as the most relevant implementation support activities.

Figure 2. Relevance of ICAO's Implementation Support Work



Source: Survey on Environmental Protection Strategic Objective

<sup>8</sup> A40-WP/102; A40-WP/55; A40-WP/56; A40-WP/176

46. In general, stakeholders assessed the State Action Plans as a critical tool for advancing ICAO's environmental protection objectives by providing a structured framework for States to outline their environmental protection strategies and progress. Moreover, SAPs were perceived as adequate to enable States to tailor their approaches to national circumstances while aligning with ICAO's global goals, fostering transparency and accountability and strengthening international collaboration. The SAPs were also considered complementary to other ICAO's technical assistance and capacity-building initiatives, such as the ACT programmes.

*"The SAP is very useful because you can organize how the State will address environmental protection, which measures it will implement. We were not part of the first phase of CORSIA, but we still monitored and reported emissions to ICAO, and this is part of our SAP."*

WACAF Member State

*"The SAP and the ACT programmes complement each other. From a strategic point of view, SAP is a very good initiative because it helps States put at strategic level its 10, 15-year journey towards aviation sustainability. ACT programmes are means that facilitate the actions outlined in the SAP."*

MID Member State

47. Regarding ACT-CORSIA, stakeholders found the programme to be highly relevant for building institutional and technical capacities at the national level for States to feasibly fulfill CORSIA requirements. The initiative's workshops, technical tools and expert guidance were considered pertinent to help States overcome implementation challenges, particularly those with limited resources and technical expertise. The programme was also perceived as relevant to ensuring that States could meet their monitoring, reporting and verification (MRV) requirements, thereby promoting consistency in emissions data across ICAO Member States.<sup>9</sup>

*"A lot of training was executed after CORSIA was approved and before the Volume 4 SARPs were released. But ICAO saw that additional support was needed and created ACT-CORSIA. The programme was critical in helping States understand what CORSIA was and how to participate."*

NACC Member State

48. Similarly, ACT-SAF was considered pertinent for ICAO to achieve ICAO's environmental protection goals, as the adoption of SAFs is a critical component of reducing aviation emissions and the most promising measure to achieve LTAG. For some stakeholders, ACT-SAF seemed less relevant than SAP and ACT-CORSIA because they do not have the resources, infrastructure or feedstock availability to produce SAF. In a few cases, stakeholders perceived ACT-SAF and ICAO's work on SAF in general as an organizational overstep of ICAO's mandate and core business. For instance, a Member State shared: "ICAO sometimes goes beyond its jurisdiction, like with SAF agendas. This distorts the market for other energies and should not be promoted by ICAO."

*"About 50% of decarbonization can come from SAF alone. At the same time, SAF production is the most technical and resource-intensive measure. This is why helping States understand the work around SAF and to conduct SAF feasibility studies through ACT-SAF is so important."*

ICAO Staff

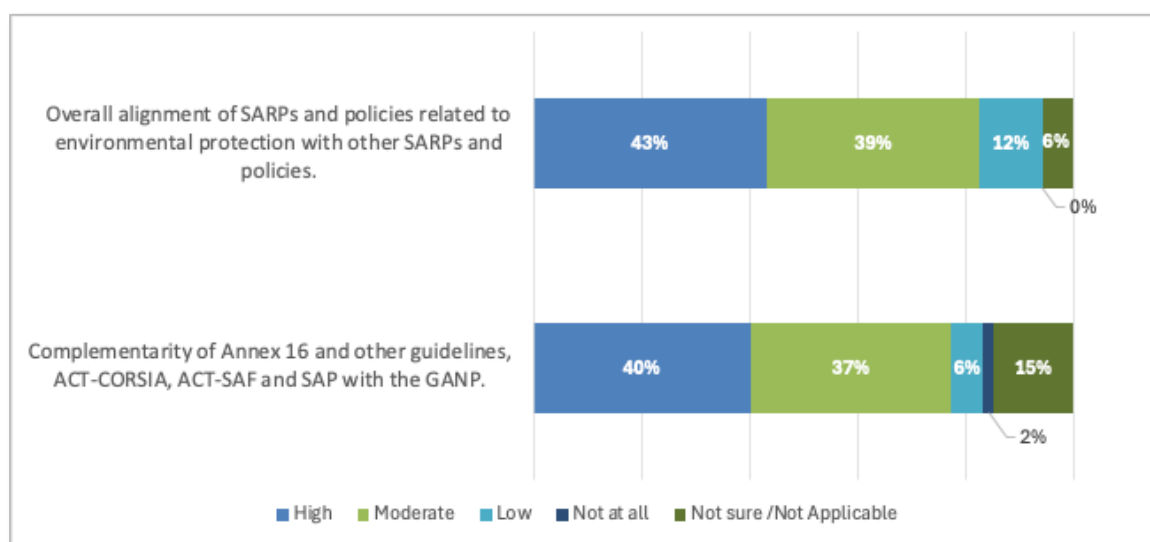
<sup>9</sup> A40-WP/102; A40-WP/55; A40-WP/56; A41-WP/370; A41-WP/371

## Coherence

**Finding 3:** ICAO's environmental protection standards, policies, programmes and initiatives generally align with other policies, programmes and projects of ICAO, including the Global Air Navigation Plan and the Global Aviation Safety Plan. While the work between ATB and ANB around environmental protection has been confined to specific issues, the coordination of work across air navigation and safety and environmental protection has been largely timely and coherent.

49. Member States generally found ICAO's environmental protection work and activities to be aligned with other ICAO's policies, programmes and initiatives (Figure 3). Most States (77%) considered that ICAO's Annex 16 and other guidelines, ACT-CORSIA, ACT-SAF and SAP to be complementary of the Global Air Navigation Plan (GANP). Across ICAO Regions, perceptions around such complementarity were lower among ESAF (67%) and MID States (67%) and higher among NACC (82%) and WACAF States (90%).

Figure 3. Perception of Member States on the Coherence ICAO's Environmental Protection Work with other ICAO Work and Activities



Source: Survey on ICAO's Environmental Protection Strategic Objective

50. The ICAO Global Air Navigation Plan is generally aligned with ICAO's environmental protection strategic objective, policies, and capacity-building programmes by emphasizing the need for sustainable growth in aviation. The GANP incorporates environmental considerations into its framework by promoting operational efficiency, the reduction of fuel burn and the deployment of innovative technologies to minimize aviation's environmental impact,<sup>10</sup> which are consistent with ICAO's environmental protection work such as CORSIA and SAF. The GANP also aligns with ACT-CORSIA and ACT-SAF in that all three initiatives prioritize capacity building and collaboration among Member States, ensuring they have the tools and knowledge needed to implement sustainable practices effectively. By fostering synergies between operational improvements outlined in the GANP

<sup>10</sup> [ICAO Global Air Navigation Plan](#).

and emissions reduction strategies like ACT-CORSIA and ACT-SAF, ICAO ensures a holistic approach to achieving its environmental protection goals.<sup>11</sup>

51. ICAO's environmental protection work is also consistent with the Global Aviation Safety Plan (GASP) and the Global Aviation Security Plan (GASeP). While their primary objectives differ from ICAO's environmental protection mandate, they share a complementary alignment through their overarching goals of ensuring a sustainable and efficient aviation system. For instance, measures in GASP that promote operational efficiency and use of advanced technologies can indirectly contribute to environmental protection by reducing fuel consumption and emissions. Though more indirectly than the GASP, GASeP's emphasis on secure and streamlined operations can support environmental initiatives like CORSIA by ensuring the integrity of emissions data and reporting systems.<sup>12</sup> In interviews, ICAO staff indicated that while work between ANB and ATB on environmental protection has been generally confined to very specific issues, the coordination among the aviation safety, aviation security and environmental protection teams has been timely and coherent to meet the needs of the organization.

*"The ownership, management and optimization of this work is complex. We manage some part and ENV manages another. We just started discussions with ENV regarding SAF related material. In the past, there was a CAEP project on the environmental impact of noise and we assisted from the performance-based navigation (PBN) perspective. ENV has been very keen to coordinate, and they have always come to us."*

ICAO Staff

*"When we have opportunities to collaborate, ATB/ENV has been collaborative, especially around efficiency. The way ANB and ATB work on environmental protection has changed. In recent years, the ENV team came and expressed interest in our view to add additional material to a manual. Another example is the most recent AN Conference, when we asked them to look at the environmental content with LTAG in mind. This worked well."*

ICAO Staff

**Finding 4:** ICAO's environmental protection objectives, work and activities are consistent with the objectives and activities of other UN agencies and partners, including the UNFCCC and the IPCC. ICAO's environmental protection goals, work and initiatives are also aligned with international instruments and tools around environmental protection, such as the Paris Agreement and the Sustainable Development Goals.

52. ICAO's environmental protection objectives, policies, technical assistance and capacity-building programmes are closely aligned with the environmental objectives and activities of other UN agencies, including the UNFCCC and the IPCC. CORSIA, as the first global market-based measure for aviation emissions, and ACT-CORSIA, its main implementation support arm, directly support the Paris Agreement's goals of limiting global temperature rise by addressing aviation's carbon footprint.<sup>13</sup> In promoting the adoption of sustainable aviation fuels, ACT-SAF also contributes to decarbonization, a key focus of UNFCCC initiatives.<sup>14</sup>

<sup>11</sup> [ICAO Global Air Navigation Plan](#).

<sup>12</sup> [ICAO Global Aviation Safety Plan](#) and [ICAO Global Aviation Security Plan](#).

<sup>13</sup> [UNFCCC Paris Agreement](#); A41-WP/362; C-WP/15586.

<sup>14</sup> [UNFCCC Global Climate Action](#) and ICAO Reports to the UNFCCC (May 2018 and June 2022).

53. ICAO's environmental protection work, and activities are also consistent with most UN Sustainable Development Goals. Specifically, ICAO's three areas of environmental protection work contribute to SDG 3 on good health and well-being by reducing the impact of international civil aviation on local air quality, regulating aircraft noise and limiting engine emissions.<sup>15</sup> ICAO's CORSIA Methodology for Calculating Actual Life Cycle Emission Values aims to ensure that SAF production prioritizes agricultural byproducts or waste to avoid a negative impact on food security, contributing to SDG 2 on promotion of sustainable agriculture.<sup>16</sup> Through multiple seminars, symposia and other global and regional events, ICAO indirectly supports SDG 4 on quality education by substantially increasing the number of adults who have relevant skills for employment on the latest environmental subjects.<sup>17</sup>
54. SAF and ACT-SAF-related efforts advance SDG 7 on clean energy and SDG 12 on responsible consumption and production by encouraging the adoption of sustainable fuels and thus promoting sustainable practices in aviation.<sup>18</sup> In promoting the use of new green technologies (i.e., more efficient aircrafts and operations, LCAF and SAF), ICAO is contributing to SDG 8 on economic growth.<sup>19</sup> ICAO's guidance on adaptation measures and partnerships with the aviation industry and governments to make aviation infrastructure more sustainable (e.g., Solar-At-Gate Project in Cameroon through ICAO-EU cooperation) support SDG 9 on industry, innovation and infrastructure.<sup>20</sup>
55. ICAO's guidance on eco-friendly airports and Clean Development Mechanism (CDM) methodologies for aviation also supports SDG 11 on sustainable cities and communities.<sup>21</sup> CORSIA and ACT-CORSIA work contributes to SDG 13 on climate action by helping States monitor and offset aviation emissions.<sup>22</sup> ICAO's SAPs, ACT programmes and partnerships such as the ICAO-EU and ICAO-UNDP-GEF work also support SDG 17 on partnerships for the goals by fostering international collaboration and knowledge-sharing.<sup>23</sup> Even though ICAO has indicated that its environmental protection work contributes to 13 out of the 17 SDGs, the evaluation only observed direct contribution to the above mentioned SDGs.<sup>24</sup>
56. ICAO has engaged the IPCC to have a detailed understanding of aviation's contributions to global atmospheric challenges since 1999. ICAO has collaborated with the IPCC by leveraging its scientific assessments on climate change impacts and mitigation options, ensuring its policies, programmes and activities are grounded in robust scientific evidence. For instance, ICAO has widely used IPCC's research, data and publications to assess the feasibility of the LTAG and to inform the work of the different CAEP Working Groups.<sup>25</sup>
57. In addition, the UN Environment Programme (UNEP), the UNFCCC and the World Meteorological Organization (WMO) are CAEP Observers.<sup>26</sup> The participation of these organizations in ICAO's technical committee is vital for ensuring coherence and alignment between ICAO's environmental protection work and the efforts of key international actors. Their expertise and insights help ICAO integrate global environmental priorities, climate frameworks and scientific data into its policies and

---

<sup>15</sup> [UN SDG 3](#)

<sup>16</sup> [UN SDG 2](#) and [CORSIA Methodology for Calculating Actual Life Cycle Emission Values](#).

<sup>17</sup> [UN SDG 4](#)

<sup>18</sup> [UN SDG 7](#) and [SDG 12](#).

<sup>19</sup> [UN SDG 8](#)

<sup>20</sup> [UN SDG 9](#); [ICAO-EU Solar-At-Gate Pilot Project](#); and [ICAO Climate Risk Assessment, Adaptation and Resilience](#).

<sup>21</sup> [UN SDG 11](#)

<sup>22</sup> [UN SDG 13](#)

<sup>23</sup> [UN SDG 17](#)

<sup>24</sup> [ICAO and the United Nations Sustainable Development Goals](#)

<sup>25</sup> [IPCC Working Group I](#); [ICAO Scientific Understanding](#); and [ICAO Committee on Aviation Environmental Protection](#).

<sup>26</sup> [ICAO CAEP Members and Observers](#).

initiatives. This collaboration strengthens ICAO's ability to address aviation's environmental impacts in a globally coordinated and scientifically informed manner.

## Effectiveness

**Finding 5:** LTAG and CORSIA are considered ICAO's top achievements across all areas of environmental protection. Other important accomplishments are SAF and CAAF/3 in the area of climate change; SARPs related to non-volatile Particulate Matter and Nitrogen Oxides regarding local air quality; and Chapter 14 SARPs in Annex 16 Volume I in relation to noise abatement. Major challenges to ICAO's environmental protection work are limited resources and the voluntary nature of the environmental initiatives.

58. ICAO has delivered high-quality and effective work to advance environmental protection in international civil aviation. Over the past 7.5 years, ICAO has demonstrated effective execution of its environmental protection work, as outlined in its Business Plans and Operational Plans, by advancing key initiatives to mitigate aviation's environmental impact.<sup>27</sup> The organization's emphasis on collaboration, capacity-building programmes and stakeholder engagement has ensured progress in aligning aviation with global environmental goals, while maintaining operational growth and international connectivity.<sup>28</sup> In the survey and interviews alike, stakeholders commended the tremendous work achieved by ICAO, particularly in the context of limited internal resources (see Finding 10 for additional results around resources).
59. For most stakeholders, LTAG and CORSIA were the top environmental accomplishments of ICAO.<sup>29</sup> Despite highly polarized views around who is responsible for the environmental degradation and related costs, LTAG represents a unified global commitment to addressing aviation's climate impact. In addition to aligning the aviation sector with the objectives of the Paris Agreement, stakeholders believed that LTAG provided a clear, ambitious target that is fostering innovation, investment and collaboration across key actors. In the view of many stakeholders, by setting this landmark goal, ICAO has strengthened its leadership in driving sustainable aviation and ensuring the sector contributes meaningfully to global climate action.

*"LTAG is the result of 2 years of work managing multiple opinions around the world. It forced the Council to make a political decision. The discussions had a high political connotation, but because of the high level of technical work of the CAEP, [the Council] was able to achieve consensus. Civil aviation has understood that it can only grow if it does so sustainably."*

Regional Aviation Organization

*"For how contentious the debates are regarding environmental protection, the LTAG was a huge step forward. It's not mandatory but it sets the path and the vision for environment. The LTAG showed that these views are getting more and more aligned. The organization is entering more and more in the field of environmental protection."*

ICAO Staff

<sup>27</sup> ICAO Business Plans [2017-2019](#), [2020-2022](#) and [2023-2025](#); ICAO Operating Plans – Environment (CMRT and CPMR).

<sup>28</sup> ICAO Operating Plans – Environment (CMRT and CPMR).

<sup>29</sup> A40-WP/411; A40-WP/194; A40-WP/102; A40-WP/56; A40-WP/193; A40-WP/194; C-WP/15587.

60. As the first and only global market-based and sector-wide effort for carbon offsetting in the world, CORSIA was also considered by stakeholders as a major achievement of ICAO.<sup>30</sup> As of September 2024, 126 Member States (65% of all Member States) participate in CORSIA. Three more States—Comoros, Mauritania and Saint Lucia—are to join the scheme in January 2025, bringing the total number of participating nations to 129 Member States and surpassing ICAO's target on CORSIA participation for 2025 (128 States).<sup>31</sup> Out of these 129 States, 57 are Small Island Developing States, least developed countries or land-locked developing countries, which have volunteered to participate despite being exempted from CORSIA requirements, per Assembly Resolution A41-22.<sup>32</sup>

Figure 4. CORSIA Volunteer States, 2021-2025



Source: CORSIA Newsletter – October 2024.

61. Participation in CORSIA is disproportionately distributed across ICAO Regions (Figure 5), with NACC (87%) and EUR/NAT (84%) observing the most State-level participation in the scheme, followed by APAC (63%), ESAF (58%) and WACAF (57%). MID (47%) and SAM (31%) have the lowest State-level participation in CORSIA.<sup>33</sup>

*"CORSIA is a big achievement. It is not only great for carbon offsetting purposes, but we are also getting good data to understand where to work."*

EUR/NAT Member State

*"ICAO has done a great job with CORSIA. CORSIA has been critical for us to establish requirements for airports. It also helps us get a sense of how we are doing on emissions."*

APAC Member State

<sup>30</sup> A40-WP/411; A40-WP/194; A40-WP/102; A40-WP/56; A40-WP/193; A40-WP/194; C-WP/15587

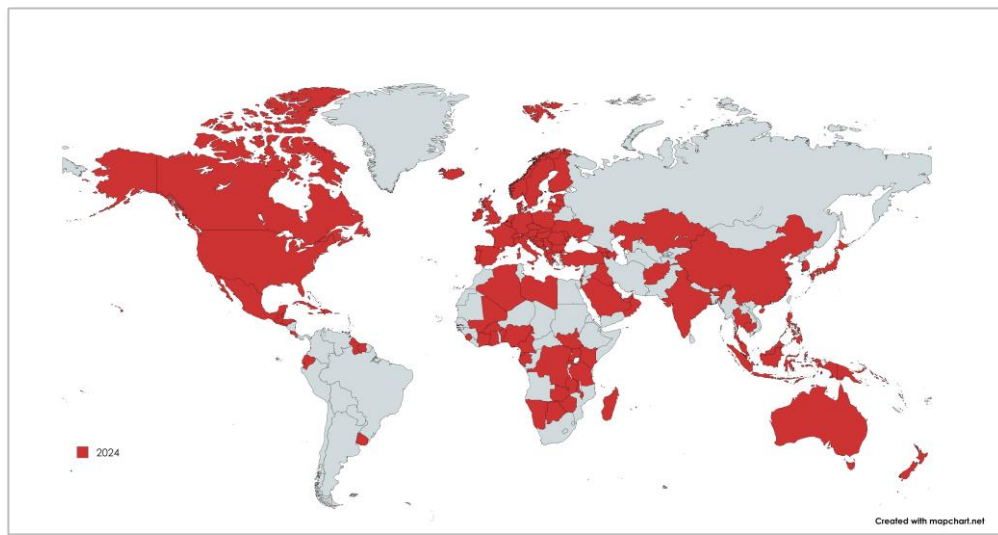
<sup>31</sup> [ICAO Carbon Offsetting and Reduction Scheme for International Aviation](#); [ICAO CORSIA States for Chapter 3 State Pairs](#); and [Climate Action Tracker](#); CORSIA Newsletter (October 2024).

<sup>32</sup> [CORSIA Newsletter](#) (October 2024); Assembly Resolution A41-22.

<sup>33</sup> [ICAO CORSIA States for Chapter 3 State Pairs](#).



Figure 5. States for Chapter 3 State Pairs 2024



Source: ICAO Environment

62. In addition to LTAG and CORSIA, SAF-related work was also considered important achievements of ICAO in the area of aviation emissions and climate change. Through initiatives like CAAF/3, LCAF and the Global Framework for SAF, many stakeholders found that ICAO's work on SAF has effectively facilitated international cooperation, policy alignment and capacity building to promote SAF production and usage.<sup>34</sup> In general, stakeholders assessed SAF-related work to be instrumental in advancing environmental protection efforts to achieve LTAG by 2050.
63. Regarding local air quality, recent updates to SARPs related to non-volatile Particulate Matter (nvPM) and Nitrogen Oxides (NOx) were highlighted as core ICAO accomplishments.<sup>35</sup> Other achievements mentioned by stakeholders included ICAO's Airport Air Quality Manual (Doc 9889) and related tools. As for noise abatement, developments related to Chapter 14 SARPs (Annex 16, Volume I) were considered a major achievement. Another accomplishment in this area was ICAO's Balanced Approach to Aircraft Noise Management.<sup>36</sup>
64. Major challenges to ICAO's environmental protection work, as reported by stakeholders, are limited resources and the voluntary nature of the environmental initiatives. Member States are not at the same level of progress, technical capacity and financial and human resources when it comes to environmental protection work.<sup>37</sup> An APAC State representative described this challenge: "The States already have to do a lot on safety and security, and now there is the environmental protection requirements. And often the States do not have the expertise at the CAAs. In APAC, some States have difficulties to catch up with technology advancement, while others don't have the technical and financial capabilities to advance SAF."
65. In the survey and in-depth interviews alike, stakeholders expressed concerns around ICAO's capacity to achieve LTAG and other important commitments if the voluntary approach to the environmental

<sup>34</sup> CAAF/3-IP/3; CAAF/3-WP/2; C-WP/15627; ICAO Annual Report of the Council to the Assembly (2023).

<sup>35</sup> A40-WP/104

<sup>36</sup> A40-WP/57; A40-WP/260

<sup>37</sup> A41-WP/470; A41-WP/471



protection work is maintained. For instance, a WACAF State representative shared: "It would be better if all States were involved in SAF because that is the best way to meet LTAG." Some stakeholders believed that ICAO cannot mandate the implementation of environmental requirements, as its approach has always been consensus-based. For others, taking a stronger enforcement approach to environmental protection would not deviate from ICAO's traditional standard-setting and adoption processes, arguing that States can file differences if they are unable to implement specific measures. ICAO has already taken a similar approach to CORSIA participation, which will become mandatory for most States in 2027, with the exception of small islands, least developed countries, land-locked developing countries and States with less than 0.5% of air traffic.<sup>38</sup>

*"Most environmental requirements come from the Assembly Resolutions, but these are voluntary. For LTAG, the work is based on voluntary effort—it is not bounding. So, we have a contradiction between the importance of environmental protection and the grounding of these requirements. States that don't have the capacity can file differences, but it should be mandatory."*

ICAO Staff

*"We reached consensus, but how are we getting this done? That is the challenge. We are only 5 years away from 2030. All Member States are starting from different levels. Some States have not even started. Some States like us have a projected growth of 0% and will need support and we cannot be held to the same expectations and requirements. We need a different approach."*

NACC Member State

66. Other challenges identified include lack of clarity around the cost of ICAO-eligible emission units and the overall economic impact of CORSIA.<sup>39</sup> With the transition of CORSIA from a voluntary to a mandatory scheme in 2027,<sup>40</sup> air operators will have to select ICAO-eligible emission units rather than any unit of their choice, as they currently can under the voluntary scheme. Stakeholders recommended ICAO provide more guidance around the estimated cost of eligible emission units, as well as conduct an analysis of the expected effects of CORSIA on aviation and non-aviation sectors. For instance, an ICAO staff member commented: "We need to have a clear economic analysis of the impact of CORSIA so that States can have a better sense of how much it's going to cost them. We don't know what the price of the carbon emission unit is because you can resell like in the stock market and that affects pricing." Similarly, an APAC State representative shared: "States need to understand the effect on the overall ecosystem because an effect on aviation also affects tourism and other transport methods."

**Finding 6:** ICAO's implementation support work and programmes are effective in assisting Member States to achieve their environmental protection goals. The State Action Plan-related assistance and ACT-CORSIA are considered the most effective capacity-building initiatives. ACT-SAF is perceived as more difficult to utilize due to the technical and operational intricacies of working with SAFs.

67. Most Member States (84%) are highly satisfied with ICAO's technical assistance and capacity-building support to achieve their environmental protection plans and activities.<sup>41</sup> ICAO's implementation

<sup>38</sup> [Aviation Benefits Beyond Borders – CORSIA Explained](#).

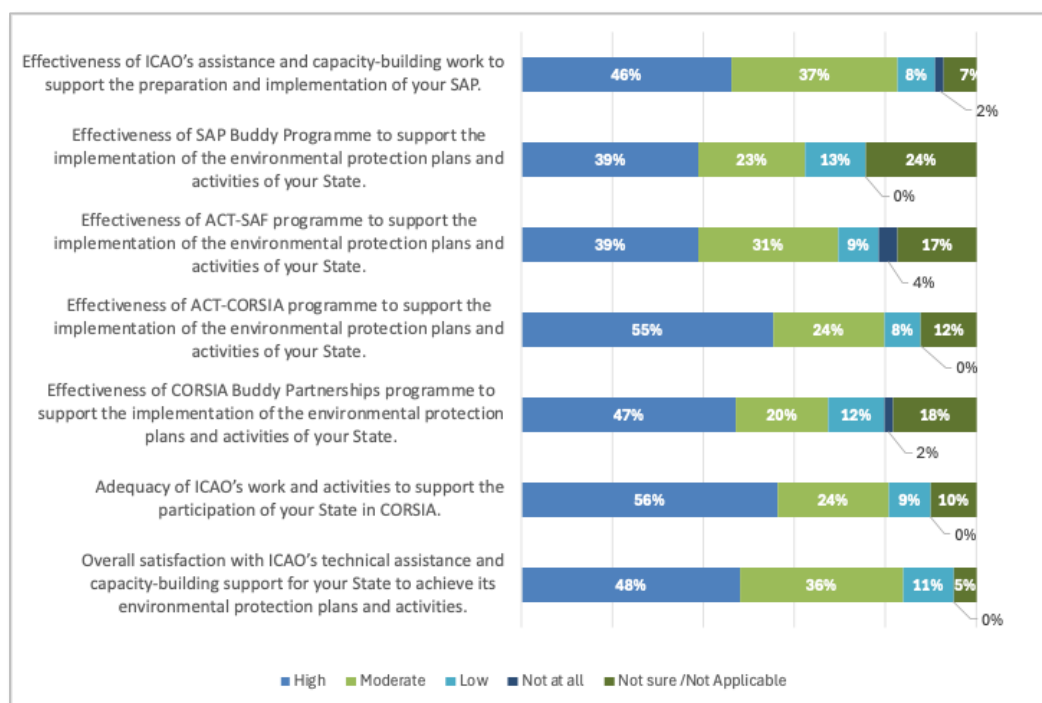
<sup>39</sup> A40-WP/289; A41-WP/432; A41-WP/173; A41-WP/477.

<sup>40</sup> [Aviation Benefits Beyond Borders – CORSIA Explained](#).

<sup>41</sup> A40-WP/227; A40-WP/339

support for the preparation and implementation of SAPs (83%) and ACT-CORSIA (80%) were considered the most effective approaches (Figure 6), while ACT-SAF (69%) and the SAP Buddy Partnership Programme (62%) were assessed as less effective. Across ICAO Regions, a large proportion of APAC States rated the SAPs (26%), the SAP Buddy Programme (32%), ACT-SAF (26%) and the CORSIA Buddy Partnerships (26%) as with low or no effectiveness at all.

Figure 6. Perceptions of Member States of the Effectiveness of ICAO's Implementation Support



Source: Survey on ICAO's Environmental Protection Strategic Objective

68. In line with ICAO's No Country Left Behind initiative, ICAO has been successful in providing effective assistance to Member States—directly, through partnerships or by facilitating cross-State cooperation—to mitigate CO<sub>2</sub> emissions from aviation.<sup>42</sup> For instance, the ICAO-EU partnership has provided capacity-building support to 24 African and Caribbean States for SAP development since 2013.<sup>43</sup> ICAO has also been effective in enabling bilateral, multilateral or regional cooperation across States for SAP development through the SAP Buddy Programme.<sup>44</sup> Removing language barriers and leveraging understanding around context-specific challenges were key benefits of these ICAO capacity-building initiatives.

*"Last year, we formalized relationships with Costa Rica, El Salvador, Nicaragua and Panama for technical assistance in developing our State Action Plan."*

NACC Member State

*"Our State benefited from the ICAO-EU Project, which helped us develop our SAP and related capacity building. We now have an environment department and know-how."*

ESAF Member State

<sup>42</sup> A40-WP/176

<sup>43</sup> [ICAO-European Union Project](#)

<sup>44</sup> [ICAO SAP Buddy Programme](#)

69. As of October 2024, 148 Member States representing 98% of cumulative global RTK coverage have voluntarily submitted their State Action Plans to ICAO (Figure 7).<sup>45</sup> These results are in line with the activities, deliverables and targets outlined in ICAO's Business and Operating Plans.<sup>46</sup> For States, SAPs are essential tools for bridging policy, technology and operational measures to achieve emission reductions effectively. Stakeholders viewed SAPs as a tool for governments to identify priorities, mobilize resources and engage with stakeholders across sectors, ensuring an inclusive approach to aviation sustainability. SAPs were also perceived as an effective mechanism for States to monitor and report progress, demonstrating their commitment to global environmental objectives while addressing their unique developmental and infrastructural needs. In this context, ICAO's continued support in developing and refining SAPs was considered crucial to empowering States to meet the dual challenges of environmental protection and sustainable aviation growth.

Figure 7. Map of State Action Plan Submissions



Source: ICAO Environment, State Action Plans and Assistance (November 2024). Green shade denotes SAP submission.

70. Regarding CORSIA, ACT-CORSIA and the CORSIA Buddy Partnerships have been highly effective mechanisms to enable CORSIA implementation and cross-state cooperation. Several stakeholders found the trainings and guidance material of ACT-CORSIA effective in harmonizing actions and capacity-building efforts at the national level for CORSIA implementation. As with the SAP Buddy Programme, the CORSIA Buddy Partnership also facilitated bilateral and multilateral cooperation across States to share knowledge and enhance capacities for the implementation of the CORSIA monitoring, MRV system and use of the CORSIA Central Registry (CCR). Since 2020, 17 supporting

*"ACT-CORSIA facilitates collaboration among regional stakeholders and Member States to resolve common challenges. We have regional entities for aviation safety and security, for example, to implement GANP. But there is none for environmental protection, only the ICAO headquarters. In many Regional Offices, there are no environmental officers. And you need this collaboration because some States don't have the resources or technical expertise to implement what ICAO is asking them to do. ACT-CORSIA helps enable this regional collaboration for environmental protection."*  
MID Member State

<sup>45</sup> [ICAO State Action Plans and Assistance](#).

<sup>46</sup> ICAO Business Plans [2017-2019](#), [2020-2022](#) and [2023-2025](#); ICAO Operating Plans – Environment (CMRT and CPMR).

States and 119 requesting States (70% of all Member States) have participated in the CORSIA Buddy Partnership.<sup>47</sup>

71. ACT-SAF has also been a critical action to facilitate the necessary knowledge and partnerships for SAF development and adoption. As of October 2024, 96 States (50% of all Member States) and 189 partners are participating or in the process of formalizing their participation in ACT-SAF.<sup>48</sup> ACT-SAF partners include private and State-owned companies, universities, aircraft manufacturers and sustainable fuel producers, among others. To date, ACT-SAF has resulted in 68 feasibility studies, 23 trainings, 23 stakeholder action groups and 20 events across all ICAO Regions.<sup>49</sup> The ICAO-EU Project supported the development of 7 SAF feasibility studies in Cote d'Ivoire, Rwanda, Zimbabwe, Dominican Republic, Trinidad and Tobago, Kenya and Burkina Faso.<sup>50</sup>
72. Although the programme was considered pertinent to achieve ICAO's environmental protection goals, ACT-SAF was found to be more difficult to utilize due to the technical and operational intricacies of working with SAFs.<sup>51</sup> Many States found ACT-SAF trainings and guidance material to be difficult to understand and translate to non-aviation counterparts. Several stakeholders recommended simplifying the language of the training material and providing further guidance on how to engage non-aviation stakeholders. In some cases, stakeholders suggested ICAO to leverage its influence to convene all national-level stakeholders—including ministries of environment, energy, finance, etc.—as part of ACT-SAF to facilitate cross-sectoral interest and commitment around SAF.

*"ACT-SAF has been useful to create the projects and match sponsors but when it comes to training, the level of material is challenging because it's very high technical level. People don't even understand the basics of chemistry; it's too technical, so it would be good to simplify." ICAO Staff*

*"ACT-SAF has been great. The challenge is the scale up because not all stakeholders have the technical capacity. SAF production requires big investments and changes in infrastructure, and it is not clear how we can achieve them. We need a roadmap for feasibility studies." APAC Member State*

73. While stakeholders were highly satisfied with ICAO's technical assistance and capacity-building programmes for aircraft emissions and climate change, several Member States also recommended developing ACT programmes for noise abatement and local air quality. In line with Finding 1, States requested more support to enhance capacities in these two areas, despite they understand that climate change is an urgent priority. For instance, a WACAF Member State recommended: "Like ACT-CORSIA and ACT-SAF, create an ACT for local air quality and noise," whereas an APAC Member State suggested: "strengthen Buddy Partnerships on diverse topics, including noise and local air quality."

<sup>47</sup> [ICAO CORSIA Buddy Partnerships \(3<sup>rd</sup> Phase\)](#); A40-WP/228

<sup>48</sup> [ICAO ACT-SAF](#) and [ICAO Cleaner Energy Tracker](#).

<sup>49</sup> [ICAO ACT-SAF](#) and [ACT-SAF Dashboard](#). Number of feasibility studies includes ICAO-led studies and ACT-SAF Partners-led studies.

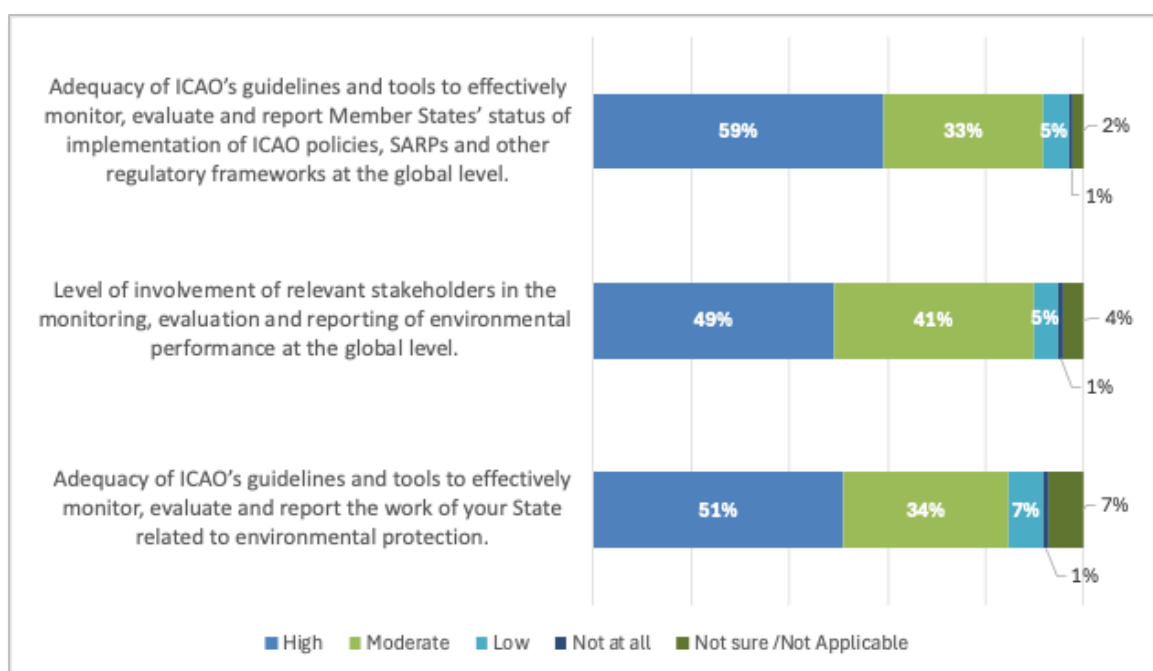
<sup>50</sup> [ICAO Cleaner Energy Tracker](#).

<sup>51</sup> A40-WP/273; A41-WP/473; A41-WP/476.

**Finding 7:** ICAO's monitoring of the implementation of Annex 16 SARPs and related activities has been generally adequate. Areas for improvement include stronger monitoring of SAP implementation and progress toward LTAG. Regarding the auditing of Annex 16, there was a nearly even split between States in favor of a full or partial audit and States against such approach.

74. On average, 89% of Member States rated ICAO's monitoring work and activities around environmental protection satisfactorily. Almost all States (92%) found ICAO's guidelines and tools (such as the SARPs and CO<sub>2</sub> emissions trackers) adequate to effectively monitor, evaluate and report Member States' status of implementation of ICAO policies, SARPs and other regulatory frameworks related to environmental protection at the global level (Figure 8). Similarly, 90% of States considered the level of involvement of relevant stakeholders in the monitoring, evaluation and reporting of environmental performance at the global level as high or moderate. Nearly 85% of States rated ICAO's guidelines and tools as adequate to monitor and report the environmental protection work of States. Perceptions across ICAO Regions were generally similar except for ESAF States, which rated the involvement of key stakeholders and ICAO's monitoring guidelines and tools lower (73% respectively).

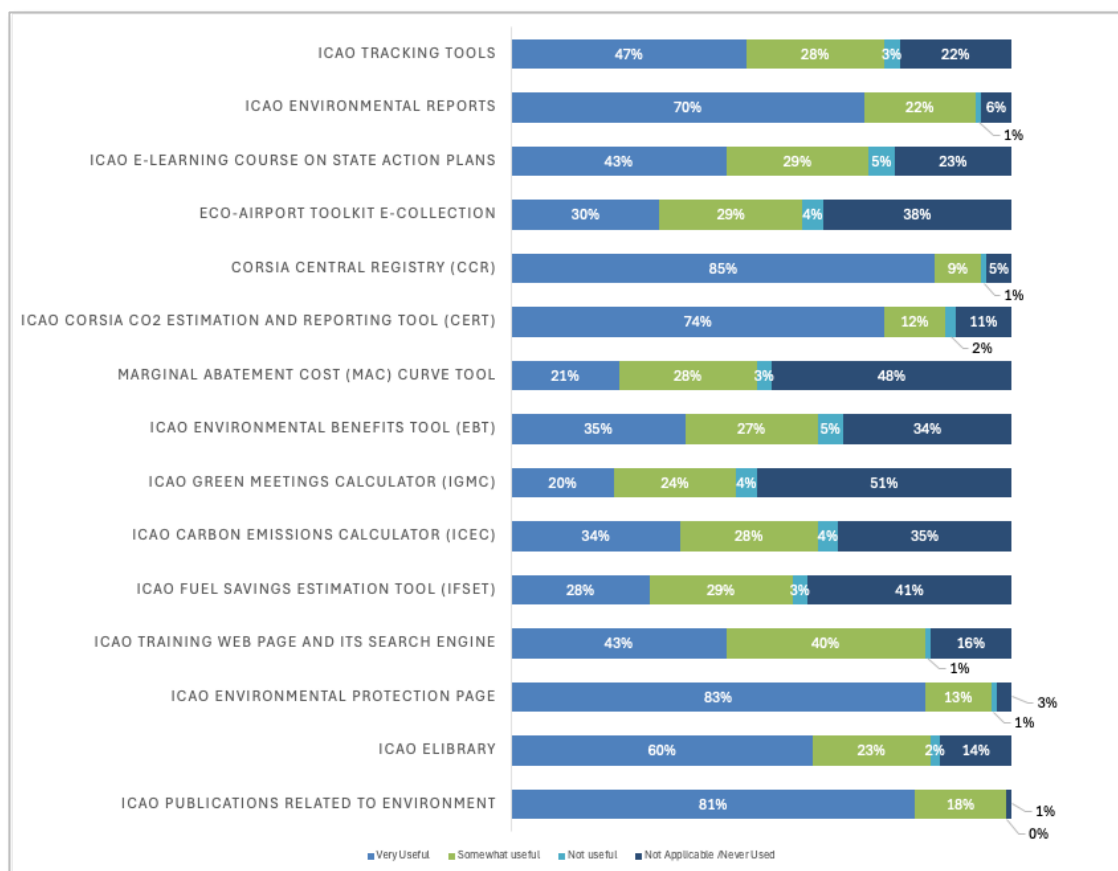
Figure 8. Perceptions of Member States of ICAO's Monitoring Guidance and Tools



Source: Survey on ICAO's Environmental Protection Strategic Objective

75. ICAO's environmental protection publications (99%), its environmental protection website page (96%) and the CORSIA Central Registry (94%) were the highest rated ICAO tools for monitoring and reporting environmental protection progress (Figure 9). Other highly rated tools were the ICAO Environmental Report (93%) and the CORSIA CO<sub>2</sub> Estimation and Reporting Tool (87%). The Green Meetings Calculator (45%), the Marginal Abatement Cost Curve Tool (49%) and the Fuel Savings Estimation Tool (56%) were the lowest rated tools. Ratings were similar across ICAO Regions.

Figure 9. Perceptions of Member States of ICAO's Resources and Tools



Source: Survey on ICAO's Environmental Protection Strategic Objective

76. In interviews, stakeholders also expressed high satisfaction with the monitoring of CORSIA implementation via the CCR, with minor suggestions for operational improvement.<sup>52</sup> In general, States found the process of reporting their CORSIA implementation progress through the registry to be straightforward. Some States commented that the CCR system can be glitchy at times and that ICAO could improve this. For instance, an APAC State commented: "CCR will not accept the report if there is a discrepancy of 0.0001 and this can delay our reporting sometimes." Others recommended setting up the CCR system in a way that progress can be observed regionally, in addition to globally. For example, a SAM State commented: "All SAM States participating in CORSIA are using the CCR to report even though [participation] is voluntary. It is a good system to see progress across the world, but we cannot see it at the regional level and the regional picture would be useful for us."

<sup>52</sup> A40-WP/228; A40-WP/229; A40-WP/266.



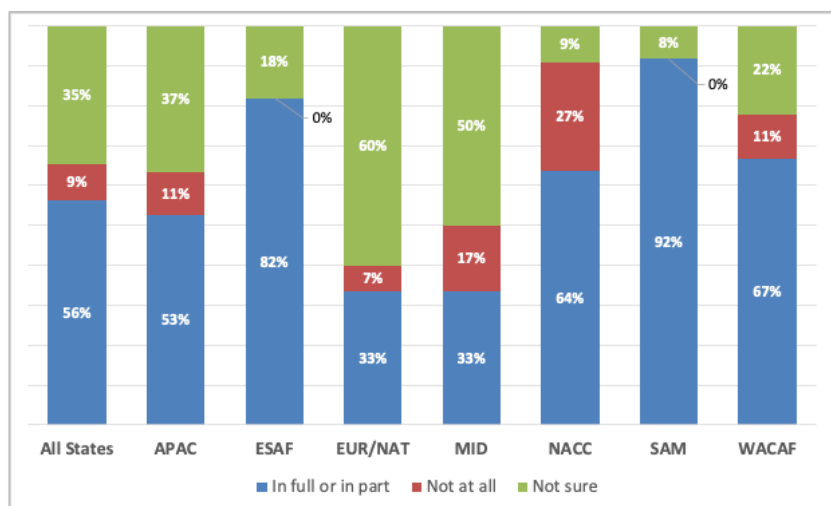
77. ICAO currently has limited visibility into the implementation of SAP measures, prompting many stakeholders to recommend a more robust monitoring framework to track progress toward LTAG.<sup>53</sup>

While stakeholders generally agreed that ICAO's technical assistance and capacity-building programmes have been effective in supporting SAP development, the organization's understanding of the actual implementation process remains insufficient. In interviews, some States acknowledged that they have not been able to implement any of the measures in their SAPs and worried that the upcoming SAP updates were only going to create additional implementation gaps. A NACC State representative shared: "ICAO does not know what the States are doing and whether States are implementing. Everything that we are doing for LTAG should be reported and monitored so that we can understand that we are progressing." It is important to note that the development of a methodology to track progress toward LTAG is ongoing and expected to be reviewed by CAEP in February 2025.

*"SAPs have been going on since 2010 and they are voluntary. About 140-150 States have developed SAPs, so it has been very successful. Because it is voluntary, we cannot demand evidence to verify information. We have been working on an LTAG reporting methodology and we will need to build systems to pull data from SAPs and other tools, like CCR, into those systems. It won't turn SAP into a reporting tool, but we will use it to assess progress toward LTAG."* ICAO Staff

78. There were diverging views among Member States on whether auditing Annex 16 could be an effective approach to improving implementation, with 56% in favor of a full or partial audit. More States preferred a partial audit (33%) over a full audit (23%) of environmental protection SARPs. Among those in favor of a partial audit, most suggested the auditing of Volumes I and IV SARPs (Figure 10). Across ICAO Regions, SAM (92%) and ESAF States (82%) were more likely to be in favor of fully or partially auditing Annex 16, whereas EUR/NAT and MID States reported the lowest approval of such measure (33% each). NACC States were more likely to oppose any auditing of Annex 16 (27%). It is important to note that over a third of States (35%) were unsure about auditing Annex 16, with higher levels of uncertainty among EUR/NAT (60%) and MID States (50%).

Figure 10. Perceptions of Member States on the Need for Auditing Annex 16



Source: Survey on ICAO's Environmental Protection Strategic Objective

<sup>53</sup> A41-WP/169; A41-WP/495

79. In interviews, stakeholders were also split about the value of auditing Annex 16, with supporters highlighting the urgency of the environmental work and opponents pointing out the burden of audits on States and ICAO's limited resources. Most stakeholders agreed that audits encourage States to prioritize critical work, fostering improved practices and increased SARP compliance. However, they also acknowledged that audits pose a significant burden to States in the form of substantial time, human and financial resources. For instance, a SAM State representative in favor of auditing Annex 16 shared: "Without monitoring or surveillance by ICAO, environmental compliance becomes less important for States because they see it as optional."
80. Opponents and those with mixed views on the benefits of auditing Annex 16 raised concerns on ICAO's effective capacity to audit environmental protection SARPs, even if partially. For example, an ICAO staff member commented: "Audits on safety and security are already hard for States. ICAO already can't audit every country. It would be better to just review the SAPs and trust the States in that they are implementing and reporting on their progress." In addition, some stakeholders highlighted the rigorous work of the CAEP in leveraging multiple high-quality data sources to inform its environmental protection work, insisting that this approach provides a reliable approximation of implementation progress.

*"Why don't we have audits for environmental protection? Is it like we are not seeing environmental protection as part of civil aviation? If the work I am implementing is not creating benefits, I need to know. We need to know what is being implemented and why we are or are not achieving progress."*

MID Member State

*"[An audit] puts pressure on countries to get work done. You better have at least the basics. So, auditing some of the environmental SARPs can be beneficial. But ICAO does not even have capacity to verify safety and security for every country, so it cannot realistically add an environmental protection audit."*

NACC Member State

**Finding 8:** The level of collaboration among ICAO, Member States, the aviation industry and regional aviation organizations around environmental protection has been highly effective. However, some duplication of work and missed opportunities to partner with important aviation actors were identified around SAF capacity-building and feasibility studies.

81. Stakeholders underscored the wide engagement of key actors, such as the aviation industry and regional aviation organizations, in ICAO's environmental protection work.<sup>54</sup> Stakeholders commended the role of the CAEP and the CEC as effective mechanisms to involve critical aviation partners and ensuring balance between the science and the socioeconomic aspects of environmental protection. For instance, an industry partner shared: "Things like LTAG and CORSIA are essential to the industry in demonstrating that there is a path to sustainable growth. Aviation is key for the developing world because it brings investment, knowledge, tourism, and overall economic opportunities. The level of collaboration with the industry is far more advanced compared to collaboration between the industry and other ICAO sections."

<sup>54</sup> A40-WP/194



*"ICAO has involved very well all the groups—Member States, environmental science experts, aviation experts, the industry, all interests—probably not all with the same level of involvement to avoid conflict of interests, but all key actors are there. This is very different from how ICAO engages in work with the industry in other areas."*

SAM Member State

*"I have been working in this field and with ICAO since 2010. There has been a change in the way that ICAO engages with the industry. My organization represents all the airplane and engine manufacturers. We have our own environmental committee with 150 technical and policy experts, who are all available to support ICAO's environmental work."*

Industry Partner

82. While high interest in scaling sector-wide efforts to develop SAF is positive vis-à-vis LTAG, it has led to work duplications around SAF capacity-building and feasibility studies. In general, ICAO, industry partners and regional aviation organizations are all providing SAF trainings and supporting feasibility studies and are not always aligning these efforts. This issue was particularly prominent in Africa. Some stakeholders believed this happens because States request support from multiple actors at the same time. Other stakeholders thought the lack of formal cooperation agreements between ICAO and these key aviation stakeholders was the root cause of the duplication. In other cases, the passive engagement of the Regional Offices was named as the reason. Overall, stakeholders recommended the development of a partnership framework to more efficiently use sector-wide resources and maximize results.

*"We see duplications of trainings and feasibility study projects around SAF with AFCAC. We were only aware of these duplications because we participate in sustainable tables to certify SAF with airlines associations and that's how we knew of those AFCAC-led efforts. We have similar targets and similar work, so there can be duplication."*

ICAO Staff

*"This happens because ICAO doesn't have a cooperation agreement with the regional organizations and the industry, except IATA and specific companies that are very involved. Regional Offices do not have this direct contact, only HQ has it [through panels]. We need coordination frameworks to better build synergies and avoid duplication."*

Industry Partner

83. In other cases, limited internal capacity at ICAO exacerbated challenges around work coordination and led to missed opportunities to partner and expand environmental protection work. Stakeholders mentioned that ICAO's limited financial and human resources can restrict organizational agility to take advantage of important partnerships, such as collaboration with important aircraft manufacturers. For instance, a stakeholder shared: "[An aircraft manufacturer] contacted ICAO headquarters to finance feasibility studies and ICAO didn't give them an answer. This is a lack-of-capacity issue due to number of human resources. [ICAO is] missing opportunities, and this impacts [its] reputation. This [manufacturer] is an important player and [ICAO] should not have missed the opportunity." Some State representatives also shared experiences of slow or no response from ICAO ENV Branch team at headquarters around SAF feasibility studies. Finding 10 discusses in more detail the impact of ICAO's limited human and financial resources on the environmental protection work.

**Finding 9:** ICAO has successfully disseminated information among aviation stakeholders on its environmental protection initiatives, programmes and achievements. Yet, most stakeholders find that ICAO's external communication to key non-aviation stakeholders—including other UN agencies and the wider public—falls short in relaying the efforts and contributions of the aviation sector to environmental protection.

84. Although the aviation sector is a relatively small contributor to global emissions compared to other sectors and ICAO has been working on environmental protection for long time, external audiences hold the perception that aviation is among the largest polluters and that it does little to reduce its environmental impact. Even other UN organizations have little awareness of aviation's impact on the environment and the work that ICAO has been doing. To many stakeholders, this prevents ICAO from having a say on environmental work that is relevant to the aviation sector and from benefiting from large environmental funds to finance ICAO's work. For instance, a NACC State representative shared: "How is the rest of the UN involving ICAO? The feeling is that UN is not involving ICAO enough in environmental protection. This creates a challenge to partnership and to insert ICAO in environmental work that touches aviation." For most stakeholders, ICAO's external communication on environmental protection should target the following key messages: a) the small contribution of aviation to global emissions; b) the importance of aviation to socioeconomic development; and c) key successful environmental protection efforts of ICAO (e.g., first ever market-base, sector-wide carbon offsetting mechanism; aspirational environmental goals).

*"We need to communicate better about the real impact of aviation on climate change. We have to collectively fight this idea that we are the bad guys and show that we have done already a lot to reduce emissions. We are not communicating properly. We need to communicate what we are doing in a different way."*

Industry Partner

*"We need to publicize more the work that ICAO has done. Other UN agencies do not even seem aware. They have big funding mechanisms for environment and ICAO is not involved largely because they do not know what we are doing. The work with other UN agencies is too high level. We need to engage them differently to access this funding."*

APAC Member State

85. In recognizing ICAO's limited resources for environmental protection, some stakeholders recommended leveraging the communication work of other aviation partners. For instance, a stakeholder suggested using the website "Aviation Benefits Beyond Borders", established by ATAG, which features Oxford Economics research on the social and economic contributions of aviation, as well as environmental efficiencies adopted by aviation to mitigate environmental degradation from aviation activities. For example, an industry partner commented: "We see a big effort from ICAO to be as inclusive as possible, yet this is happening with limited internal resources. ICAO is doing what it can, but it could do better by leveraging communication resources developed by partners rather than doing that by themselves or not doing much."

## Efficiency

**Finding 10:** The quality of ICAO's technical expertise in environmental protection to support Member States is considered high. Yet, the quantity of and allocation of ICAO's financial and human resources to achieve its environmental protection goals is not adequate. Staff burnout as a byproduct of limited internal resources in the organization is an important concern among stakeholders.

86. Over 80% of States deemed the quality of ICAO's technical expertise and capacity-building resources in environmental protection at the regional and global levels as appropriate (Figure 11). This contrasts with lower ratings around the quantity of human resources with technical expertise in environmental protection at the regional (66%) and global levels (68%). NACC (55%) and ESAF States (27%) were more likely to rate the quantity of human resources with adequate expertise at the regional level as with low or no effectiveness. These findings are consistent with comments from interviewed stakeholders who highlighted insufficient human resources at Headquarters, inadequate technical expertise in Regional Offices and overreliance on meteorology officers to properly support the implementation of environmental protection work.<sup>55</sup>

*"ICAO has technical knowledge—no doubt—but in terms of number of staff, it has limited resources. Is environmental protection really a priority for ICAO? If yes, it should reconsider the level of staff for environmental protection. All its Regional Offices should have enough staff to address the State demands and the importance of environmental protection."*

EUR/NAT Member State

*"We need more people providing support at regional level. There are mostly MET officers supporting ENV in Regional Offices and States need more technical support than what MET officers can provide. Some States can be supported through a call or email, but other States need support on the ground. If you don't have that, you spend resources on travel."*

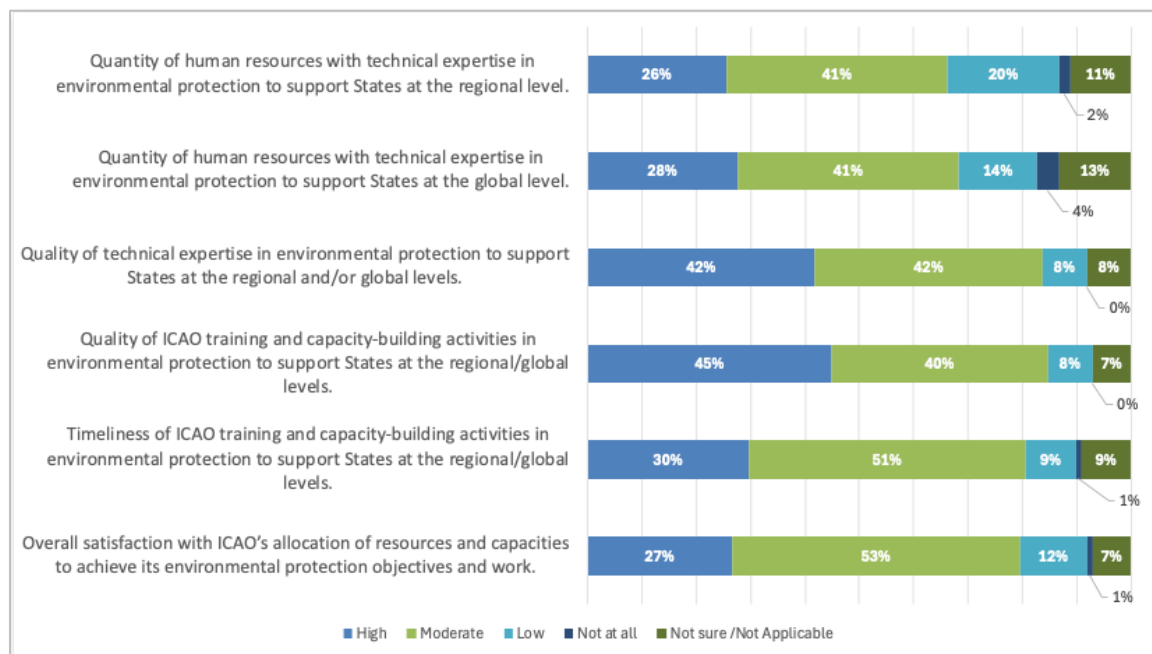
ICAO Staff

87. The unequal prioritization of work across the three areas of environmental protection, as discussed in Finding 1, is also perceived by stakeholders in the hiring of specialized staff. Multiple stakeholders expressed dissatisfaction with the time and process it has taken ICAO to secure a new noise abatement expert. For instance, a NACC State representative said: "There has been a vacancy in the noise working group for long time. They first advertised the position at a lower level and couldn't find anyone qualified. I hope they now advertise it at higher level." Similarly, an industry partner shared: "Not having a noise technical officer for two years has been an issue. Council is not approving the resources. I do not understand how ICAO does not have the resources for such an important permanent position."

---

<sup>55</sup> C-WP/15586

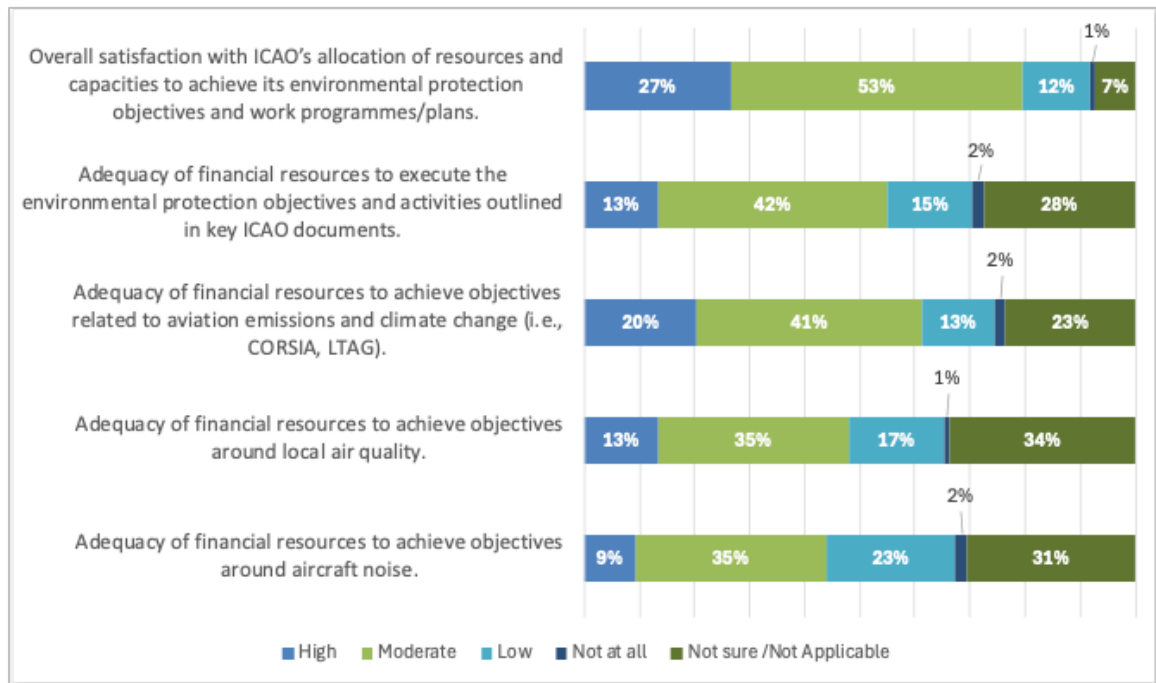
Figure 11. Perceptions of Member States of ICAO's Human Resources in Environmental Protection



Source: Survey on ICAO's Environmental Protection Strategic Objective

88. In addition to the quantity of ICAO staff with technical expertise, concerns around the availability of technical expertise in new environmental topics were also raised. Stakeholders said there are sector-wide challenges to hiring technical expertise that are not ICAO-specific and are due to the novelty of some environmental topics, such as SAF. For instance, a NACC State representative explained: "There is a personnel issue in quantity at ICAO. But when we talk about SAF, it is hard to find this expertise in general. It is a challenge for the aviation sector at large. Even [our CAA] is trying to hire SAF people and it is hard because it is such a new topic." Some stakeholders recommended ICAO collaborate with universities and training providers to develop a skilled aviation workforce capable of addressing emerging environmental challenges.
89. As with human resources, ICAO is also financially under-resourced for the demands of environmental protection work. Just over half of Member States (55%) were satisfied with ICAO's financial resources to achieve its environmental protection objectives and activities (Figure 12). Only 61% of States deemed the financial resources allocated to aviation emissions and climate change adequate. Similarly, less than half of States considered the financial resources dedicated to local air quality (48%) and noise abatement (44%) as appropriate (Figure 12). Across ICAO Regions, ESAF (45%), NACC (36%) and MID States (33%) were less likely to rate ICAO's financial resources to meet its environmental goals as adequate.

Figure 12. Perceptions of Member States of ICAO's Financial Resources for Environmental Protection



Source: Survey on ICAO's Environmental Protection Strategic Objective

90. Coupled with continuous Council requests for additional work and no proportional budgetary adjustments, these resource limitations risk staff burnout and deterioration of the quality of the environmental work. A comparative analysis of the Business Plans and Assembly Resolutions shows an exponential growth in work deliverables expected from the ENV team over the years. This increasing workload is straining ENV personnel. Stakeholders were worried that burnout is not only affecting staff well-being but also risks diminishing the quality and consistency of environmental protection efforts. Stakeholders also commented on high turnover issues at ENV and worried about its impact on preserving institutional knowledge and disrupting the momentum of ongoing projects. Stakeholders believed that the lack of adequate resources and investment to support staff and high-quality operations could ultimately undermine ICAO's long-term environmental protection goals and commitments.

*"The environmental team has done an incredible job with the little resources it has. But we have a vicious cycle where everything is urgent, new urgent work is added every cycle, but we don't put more money for the new urgent stuff. ICAO cannot afford to be slow about SAF or CORSIA. The topic of raising the quota is sensitive, but we must put the money into what we say is a priority."*

SAM Member State

*"Our work is expanding daily and we are not growing in terms of resources. We are going to implode and won't be able to sustain the quality. The work-life balance of ENV officers at HQ is terrible and that's why we have such bad turnover, people stay at ENV only 3 years. It is similar at the Regional Offices because we are giving MET officers extra work on top of their MET responsibilities."*

ICAO Staff

**Finding 11:** Member States highly rated ICAO's capacity-building activities and programmes to support national-level implementation and cross-state partnerships. However, limited involvement of other ICAO functions—such as CDI/GAT—and a perceived passive engagement of the Regional Offices were mentioned as barriers to greater implementation support.

91. Despite high satisfaction with ICAO's technical assistance work, limited engagement of CDI is perceived as a missed opportunity to expand implementation support across States. Stakeholders agreed that SARP development on environmental protection should only be done by the ENV team. However, they also believed that work around capacity building—such as ACT-CORSIA and ACT-SAF—does not need to be directly managed by ENV. Specifically, stakeholders thought capacity-building programmes can be developed by ENV and delegated to CDI once they reach maturity,<sup>56</sup> as validated by the ENV team.
92. Stakeholders identified the following factors as drivers of low CDI involvement in environmental protection work: 1) lack of environmental protection expertise at CDI; 2) concerns about the impact of CDI's cost-recovery approach on States' access to implementation support, particularly among small and least developed countries; 3) delegation and management approach at ENV. Because CDI lacks permanent expertise in environmental protection, work related to ensuring the quality of consultants, project design, management and final deliverables would fall on the ENV team. Given the limited human and financial resources at ENV, as described in Finding 10, it was unclear to stakeholders how this approach would effectively release work from the environmental team. Others argued that this is the same approach ENV takes, as many of its staff members are consultants.
93. All technical assistance and capacity-building programmes on environmental protection are currently delivered to the States at no cost. There is concern among stakeholders that moving these assistance services to a cost-recovery basis could adversely affect implementation levels and increase implementation gaps across States. Given the highly political connotation of the environmental work, stakeholders fear that using a cost-recovery approach could discourage State participation and slow down the progress achieved so far. Some stakeholders suggested having a free version of the ACT programmes covering foundational content that all States should receive and offering additional ACT content to those in more advanced stages on a cost-recovery basis through CDI. However, this approach can conflict with the No Country Left Behind principle.
94. Stakeholders also identified the ENV team's approach to work delegation and management as another barrier to expanding implementation support. There is a general perception among stakeholders of overprotection of the environmental work by the ENV team at headquarters. Stakeholders assessed this management approach as counterproductive to scaling up the environmental work to achieve LTAG and other commitments. For instance, a Council Member shared: "ENV has done an amazing job with CORSIA and SAF. The initiatives are a good example of policy and programming, but not of replicability due to a lack of delegation. ENV needs to focus on its strengths and take a more taskforce-led approach. CDI can achieve economies of scale and efficiency around environmental capacity building. We cannot risk losing support and funding for this work."

---

<sup>56</sup> Point where a program has developed, refined and optimized its processes and structures to achieve its objectives effectively and sustainably. A mature program demonstrates consistent performance and adaptability to changing conditions while maintaining its core purpose.

*"The ACT programmes are great. However, there should be a split between SARP development and implementation support. One needs to inform the other, but you don't need ENV running everything. The ENV team tends to control the work. We need a lot of people working on this, not a small team in Montreal. We need to scale rapidly. ENV needs to rethink its role and what other functions at ICAO can do to speed up this process."*

Industry Partner

*"The ENV team does have a delegation problem. The work is growing daily and it is not feasible for a small team to do it all. But the other challenge is that CDI doesn't have the expertise in their staff – they only do project management. ENV also has many consultants, but they have the expertise to supervise them. Either way, relying on consultants is not the right approach. We need to explore a better way of working."*

ICAO Staff

95. GAT is another ICAO arm for implementation support with little involvement in environmental protection work. Between 2013 and 2024, ICAO has delivered 52 training courses on environmental protection (i.e. only 13% of all GAT courses): 14 were delivered by ICAO and 38 were delivered an ICAO-recognized TRAINAIR PLUS Member. These trainings have benefited 562 people primarily in APAC (53%) and NACC (27%), followed by trainees in ESAF (9%), EUR/NAT (6%), SAM (3%), MID (1%) and WACAF (1%). The trainings covered content on CORSIA verification (virtual and in-person), airport greenhouse gas management, leadership in energy and environmental design and operation of airport infrastructures, environmental management in airports and mitigation of noise level generated by helicopters.
96. In the past three years, ICAO delivered 15 environmental protection trainings through GAT, either directly or through TPP Members, benefiting 146 individuals mainly in APAC (41%) and NACC (25%), followed by EUR/NAT (18%), (ESAF (11%) and MID (5%). No courses were delivered in SAM and WACAF between 2022 and 2024. The highest increase in the proportion of training deliveries over the past three years was observed in the EUR/NAT Region.<sup>57</sup>
97. As of October 2024, GAT has only one training package on environmental protection, out of a total portfolio of approximately 400 courses.<sup>58</sup> This training package comprises four courses and focuses on CORSIA verification. Since the establishment of CORSIA, GAT has delivered this training to 387 people (Figure 13). Key drivers of the limited GAT training offering on environmental protection include: 1) unavailability of a focal point at ENV to support the development of GAT trainings, as the former focal point left in September 2023 and a new focal point had not been assigned yet; 2) limited human resources at ENV to assist GAT in developing courses; and 3) insufficient maturity<sup>59</sup> of ACT programmes to be transferred outside of ENV. GAT and ENV held a meeting in October 2024 to discuss the designation of a new focal point and the development of three new training programmes with support from GAT-hired consultants in 2025.

<sup>57</sup> Data provided by GAT (October 2024).

<sup>58</sup> Data provided by GAT (October 2024).

<sup>59</sup> Point where a program has developed, refined and optimized its processes and structures to achieve its objectives effectively and sustainably. A mature program demonstrates consistent performance and adaptability to changing conditions while maintaining its core purpose.



Figure 13. GAT Environmental Protection Courses, 2013-2024

2013-2024					
Rank	Courses	Trainees	Course Deliveries	Male (%)	Female (%)
1	CORSIA Verification (CORSIA EN): Virtual Classroom	196	19	62%	38%
2	CORSIA Verification (CORSIA EN)	181	16	62%	38%
3	Airport Green House Gas (GHG) Management	102	10	89%	11%
4	Leadership in Energy and Environmental Design and Operation of Airport Infrastructures	42	3	79%	21%
5	Gestión Medioambiental en Aeropuertos	24	2	46%	54%
6	Curso Sobre Verificaciones en el CORSIA (CORSIA SP)	10	1	60%	40%
7	Mitigación de nivel de ruido generado por helicópteros	6	1	100%	0%

2022-2024					
Rank	Courses	Trainees	Course Deliveries	Male (%)	Female (%)
1	CORSIA Verification (CORSIA EN): Virtual Classroom	110	11	61%	39%
2	CORSIA Verification (CORSIA EN)	15	2	73%	27%
3	Gestión Medioambiental en Aeropuertos	11	1	73%	27%
4	Curso Sobre Verificaciones en el CORSIA (CORSIA SP)	10	1	60%	40%

Source: ICAO Global Aviation Training

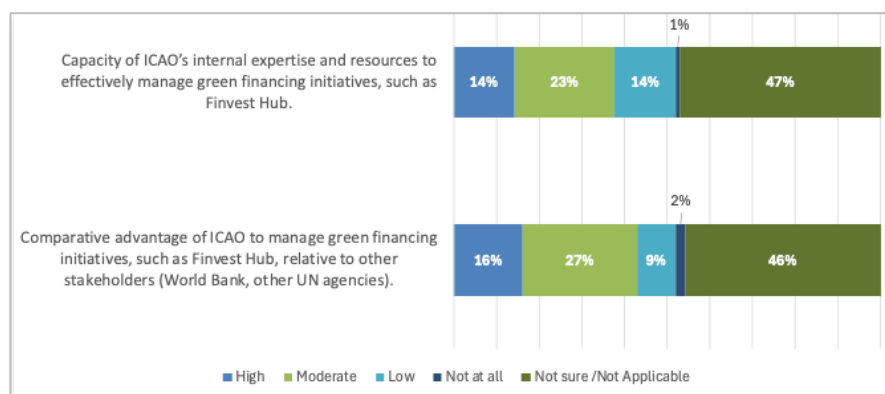
**Finding 12:** The Finvest Hub initiative is welcomed as an innovative solution to advance ICAO's environmental protection work around SAF, particularly in the context of the No Country Left Behind principle. Yet, there are concerns around the ability of developing States to reach the necessary conditions to access the financing, as well as ICAO's internal capacity and competitive advantage to effectively manage the initiative.

98. There is excitement as well as hesitation among Member States and other aviation stakeholders around the Finvest Hub initiative. Stakeholders generally perceived the proposed mechanism as an innovative solution to the limited financial and human resources of environmental protection work, as discussed in Finding 10. Due to the novelty of the initiative, some stakeholders remain cautious about its functioning, potential benefits and ICAO's capacity to manage Finvest Hub initiative.<sup>60</sup> For instance, less than half of States thought ICAO has a comparative advantage in managing green financing initiatives like Finvest Hub initiative over other stakeholders, such as the World Bank or other UN agencies (43%) and that the organization has internal expertise and resources to manage such initiatives (38%). The other half of States was uncertain about how to rate these aspects (Figure 14).

<sup>60</sup> A41-WP/435



Figure 14. Perceptions of Member States of ICAO's Finvest Hub initiative



Source: Survey on ICAO's Environmental Protection Strategic Objective

99. All stakeholders interviewed by OIO agreed that ICAO is best positioned as a matchmaking facilitator between viable SAF projects and funding, rather than as the financial manager of Finvest Hub initiative. For stakeholders, ICAO's competitive advantage lies in its technical capacity and quality assurance of the projects to reduce risk perceptions among investors. Other UN agencies and development banks, such as World Bank, were perceived as better suited to financially manage the fund.

*"Finvest is a great initiative and very much needed, but it is very technical and out of the scope for ICAO to manage the fund. The role of facilitator of partnerships for that fund is better suited for ICAO. The industry consensus is that the initiative is great and very needed, but not the role of ICAO."*

Industry Partner

100. There are concerns around equitable access to Finvest Hub initiative resources across States, particularly regarding the cost of the financing. Even if ICAO can leverage its feasibility studies to reduce risk perceptions, it may not be able to influence the cost of the financing. Developing States expressed concerns about facing higher borrowing costs due to less favorable credit ratings, which can create disparities in their ability to leverage Finvest Hub initiative effectively. Because of this, stakeholders feared that the initiative could place these States at a disadvantage in implementing necessary environmental or infrastructure projects, exacerbating existing gaps in resources and capabilities between developed and developing States. Addressing these concerns is critical to ensuring Finvest Hub initiative supports inclusive growth and enables all States to contribute meaningfully to shared environmental and development goals.

101. Some stakeholders warned that ICAO does not have adequate structure and internal expertise for Finvest Hub initiative. The proper management of green investment funds requires high technical know-how in both finance and environmental infrastructure project management, an expertise that is not currently available at ICAO. Given the limited resources of the organization for environmental work, some stakeholders questioned whether this was the right approach to funding SAF work and suggested leveraging existing ICAO partnerships instead, such as the partnership with the International Renewable

Energy Agency (IRENA).<sup>61</sup> Others highlighted the need for a new organizational structure (e.g., an ENV Bureau) to adequately execute this initiative (see more in Finding 14).

*"I don't know if ICAO can cope with this type of initiative because it is not its core business. The Secretary General was under extreme pressure to figure out an alternative funding mechanism for the environmental protection work, forcing ICAO into a field where it does not have expertise. ICAO can support looking for other financing options, but I'm not sure the organization will be successful in fulfilling this task."*

EUR/NAT Member State

*"We don't even have a financing unit for aviation-specific projects, for example, to build an airport. All we do is facilitate projects. There is a misconception that we can have money for SAF projects. ICAO's role around Finvest should focus on de-risking the projects, but we should not manage the investment side. Not even CDI can do that. Those are huge infrastructure projects. Reducing risk perception is where ICAO can add value."*

ICAO Staff

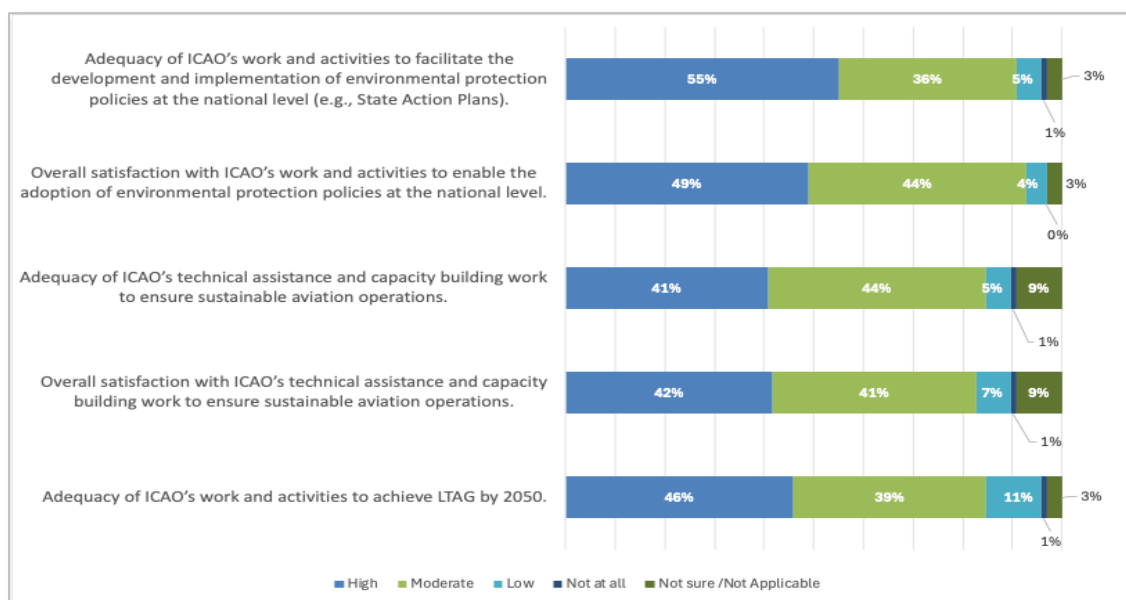
## Sustainability

**Finding 13:** ICAO's work activities have enabled the adoption of national-level environmental protection policies and regulatory frameworks. ICAO's capacity-building efforts through SAPs and ACT programmes have also helped ensure sustainability. Yet, State-level limitations around cross-sectorial coordination, technical capacity and human resources were considered important barriers to sustaining current progress.

102. Almost all States were satisfied with ICAO's work to enable the adoption of environmental protection policies at the national level (93%) and with ICAO's technical assistance and capacity-building activities to ensure sustainable aviation operations (83%) (Figure 15). This trend was similar across ICAO Regions except for SAM States, which were less likely to be satisfied with ICAO's technical support and capacity-building efforts (58%). Examples of how ICAO's work facilitated important national measures for environmental protection in aviation include the creation of an Environmental Protection Unit within the CAA in Panama, the launch of an Aviation Strategy in Norway, the creation of a Clean Flight Program in Chile and the development of a SAF Expansion Policy in South Korea, to name a few.

<sup>61</sup> [ICAO and IRENA join forces to accelerate access to financing and implementation of aviation decarbonization projects](#)

Figure 15. Perceptions of Member States of ICAO's Environmental Work Sustainability



Source: Survey on ICAO's Environmental Protection Strategic Objective

103. Most States (85%) considered ICAO's work and activities appropriate to achieve LTAG by 2050, while limitations around national-level cross-sectorial coordination and technical capacity were identified as key barriers to progress. Almost all States participating in the evaluation highlighted difficulties in engaging key actors beyond the CAA to advance their environmental protection work. Compared to aviation-specific environmental work, such as CORSIA, stakeholders found the implementation of work around SAF far more complex because it requires the cooperation of other authorities, such as the ministries of environment, finance, and energy, among others. Many States requested ICAO support and guidance on how to engage non-aviation stakeholders, with some specifically proposing the creation of a standardized framework/roadmap to facilitate this stakeholder engagement process. Others suggested that ICAO leverage its influence to convene high-level meetings involving aviation and non-aviation stakeholders as part of ACT-SAF.

*"ICAO can present a strategic perspective to the entire environmental protection sector within a State to facilitate the collaboration with actors beyond the CAA. ICAO could also produce draft regulations that can guide countries on how to shape adequate policies and legislation to being able to do this work."*

MID Member State

*"ICAO could facilitate the engagement of high-level government authorities and non-aviation players, including Financial Institutions, to speed up legislation development and action around SAF. ICAO has leverage that the CAAs do not to move things faster."*

NACC Member State

104. Limited human resources and technical capacity at the CAA level restrict the reach of ICAO's technical assistance and capacity building programmes, affecting the sustainability of their benefits. States with small or understaffed CAA teams reported difficulties to allocate adequate resources and time to fully engage with ICAO initiatives, from training programmes to events and direct technical assistance.

Limited technical expertise within these teams further hinders their ability to understand, implement and adapt the advanced methodologies and technologies promoted by ICAO. ICAO staff also reported results sustainability challenges in the form of high focal point turnover. For instance, ICAO staff member shared: "One challenge is the constant change of focal points. Sometimes [States] don't tell us that the focal point changed. We need to make sure ACT serves to have continuity and that new focal points get trained." Stakeholders said these challenges risk the consistent and sustained application of environmental protection strategies into national aviation policies and operations.

*"When one person from the CAA goes to an ICAO meeting, they listen but they can't keep up with the technicality and breath of topics. Some CAAs have a team of 1-3 people. If one attends an ICAO training or event for a couple days, half or more of the CAA work stops. So, this limits capacity building."*

WACAF Member State

*"Many CAAs don't have the manpower and financial resources to keep up with these requirements. We are now overloading their capacities and ICAO doesn't have enough experts at the regional level to support them. SAF will help a lot only if States can implement the work."*

Industry Partner

**Finding 14:** The use of voluntary contributions, secondments and the Finvest Hub initiative are relevant approaches to financially support ICAO's environmental protection work. However, a revision of the organization's regular budget and structure are proposed as critical measure to sustain the increasing amount and level of urgency of the environmental protection work.

105. About two-thirds of States assessed the use of voluntary contributions (64%), the Finvest Hub initiative (60%) and secondments (59%) as pertinent to supporting ICAO's environmental protection work (Figure 16). Yet, only about half found voluntary funds (53%), Finvest Hub initiative (49%) and secondments (52%) as viable mechanisms to ensure the sustainability of the work going forward. Across ICAO Regions, MID States were less likely to consider any of these three approaches (17% respectively) as adequate to sustain current progress. NACC States were more likely to rate the use of voluntary funds (73%) as a viable approach. WACAF States were more likely to favor the use of secondments (78%) to sustain ICAO's environmental work.

106. For many stakeholders, the increasing work on new environmental topics (i.e., SAF, non-CO<sub>2</sub> emissions, etc.) and the growing demand for implementation support requires a revision of the organizational structure and a substantial increase in budget allocation for environmental protection.<sup>62</sup> Several stakeholders proposed the creation of an Environment Bureau, arguing that it can make the organization more agile in delivering increasing quantity and complexity of work. An important recommendation was to keep any SAF

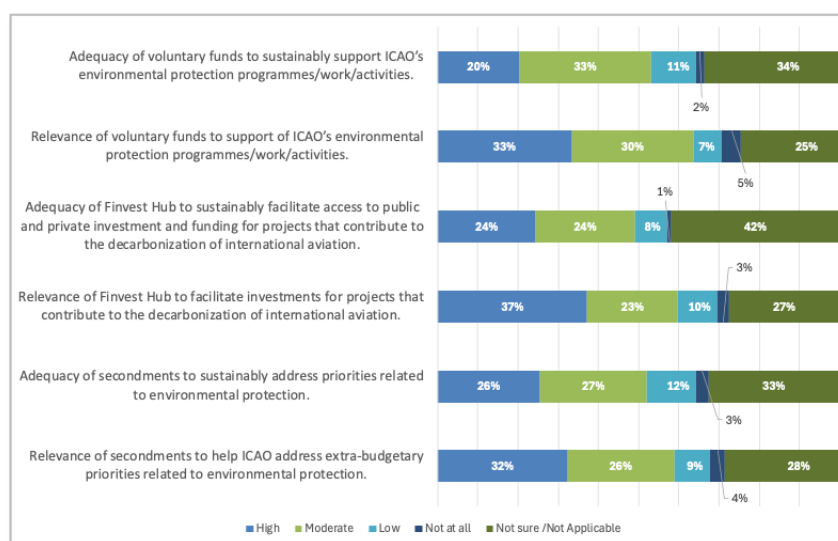
*"I am worried about the leadership structure of ENV. The base is getting wider in terms of topics with only two people on top. I worry the work will have too many bottlenecks and getting work done will get more bureaucratic and slower. Eventually, we will need new sections or a new bureau."*

ICAO Staff

<sup>62</sup> ICAO Assessment of Member States' Needs and Expectations.

financing structure together with ENV to ensure the technical independence and integrity of the environmental work. For instance, a stakeholder shared: "Putting financing somewhere separate from ENV is risky and makes this work more vulnerable to politics. I worry that for one part of the framework—the financing—you get a Chief, but you don't have a Chief for the entire cleaner energy area. This is a very economically loaded discussion because anything under SAF is worth billions of dollars. We need to stay neutral to political pressures."

Figure 16. Perceptions of Member States of the Use of Voluntary Funds, Finvest Hub initiative and Secondments to Support ICAO's Environmental Protection Work



Source: Survey on ICAO's Environmental Protection Strategic Objective

107. In addition to restructuring ENV at headquarters, stakeholders also recommended adjustments for enhanced implementation support at the regional level. Specifically, most considered that there should be at least one regional environmental officer in each Regional Office for ICAO to provide adequate implementation support. There were also recommendations to decentralize some of the environmental protection work to the Regional Offices, such as building strategic partnerships with local aviation and non-aviation actors. Stakeholders also suggested giving the Regional Offices more budgetary discretion for environmental protection work. For instance, a stakeholder shared: "ICAO needs to flatten out the budget control. As of now, the Deputy Directors don't have budget control for this work. They have budgets but they need to go to the top to get approval to use it. Increased budget control would improve efficiency."

108. The revision of ICAO's regular budget was also recurrently mentioned as a critical step to improving implementation support at headquarters and regional levels and ensuring the sustainability of the results achieved. Proportional budgetary adjustments are needed to meet current work demands as well as to address the structural challenges described above. One stakeholder shared: "Connecting the budget with the Strategic

*"The Business Plan is currently under revision. Re-prioritization is one approach we will take. But the adequate and timely delivery of this work will require new capacities and a new structure within ICAO. We may need an ENV Bureau with separate units for CORSIA, SAF and other workstreams."*

Council Member

and Operating Plans is critical. The new Business Plan will align these pieces better, but the environment is still very under-resourced." Some stakeholders recommended an increase in the quotas. A SAM State representative said: "We clearly need more resources. The prioritization approach is no longer working because even what gets prioritized doesn't get money. We can't keep going like this. We need to increase the quota."

## CONCLUSIONS AND RECOMMENDATIONS

---

### Conclusions

109. Conclusion 1: Member States are generally satisfied with ICAO's standard-setting and implementation support work to fulfill its Environmental Protection Strategic Objective. Ensuring the environmental protection work remains science-based and is shielded from political pressures is vital to realize key ICAO environmental goals and commitments, including LTAG. (Linked to all findings).
110. Conclusion 2: ICAO's monitoring work related to Annex 16 has been largely adequate. The preparation of a monitoring methodology to track progress toward LTAG is relevant and appropriate. Stronger monitoring of SAP implementation to further strengthen ICAO's capacity to monitor global and regional advancements to achieve key environmental protection targets and commitments. (Linked to finding 7).
111. Conclusion 3: Given the increasing expansion of work to new environmental topics such as SAF and non-CO<sub>2</sub> emissions, ICAO's current organizational structure presents challenges to sustain high-quality and timely support to Member States and to scale up the environmental protection work. Key barriers to greater organizational effectiveness are the heavy centralization of implementation support work at ICAO Headquarters and inadequate technical expertise in Regional Offices. Reviewing the organizational structure—vis-à-vis current and future environmental protection work—and restructuring ICAO's Environment Branch are necessary to ensure the appropriate allocation of financial and human resources to deliver high-quality work across standard-development, monitoring and implementation support. (Linked to findings 8, 10, 11, 12 and 14).
112. Conclusion 4: The prioritization approach to the environmental protection work has been useful but insufficient to meet the growing quantity and complexity of the work. A proportional adjustment of the ICAO regular budget is imperative for the organization to achieve key environmental results within the timeline of LTAG and other environmental commitments. Otherwise, ICAO risks losing support and credibility as a leader in environmental protection. (Linked to findings 5, 10 and 14).
113. Conclusion 5: ICAO could improve communication around its environmental work, initiatives and achievements to stakeholders beyond the aviation sector. Similarly, the organization could better leverage its institutional influence to engage non-aviation stakeholders for greater and faster environmental protection work implementation. (Linked to findings 8, 9 and 13).

## Recommendations

114. Recommendation 1: The Secretariat should review and revise the structure of ICAO's Environment Branch and, while ensuring the maintenance of the technical integrity of the work, determine the optimal organizational design to deliver on the environmental protection work taking into account the existing and emerging areas. (Linked to all findings and conclusions).

Priority	Time Implication	Resource Implication
High	December 2026	High

### Closing criteria

- ICAO Environment structure review report.

115. Recommendation 2: The Secretariat should develop a monitoring mechanism for State Action Plan (SAP) implementation. This mechanism should be aligned with and complement other methodologies already developed to monitor progress toward LTAG. To the extent possible, this monitoring mechanism should provide ICAO with greater visibility into the status of SAP implementation while allowing reporting flexibility to avoid overburdening States with stringent requirements. (Linked to finding 7 and conclusion 2).

Priority	Time Implication	Resource Implication
High	December 2026	Medium

### Closing criteria

- SAP monitoring mechanism developed.

116. Recommendation 3: The Secretariat should develop and implement an action plan to improve the financial and human resource availability for the Environmental Protection Strategic Objective. This should include assessing and strengthening resource gaps at ICAO Headquarters as well as in Regional Offices for more effective implementation support to the States. (Linked to findings 10, 11, 12 and 14 and conclusions 3 and 4).

Priority	Time Implication	Resource Implication
High	December 2026	High

### Closing criteria

- ICAO action plan on financial and human resources for the Environmental Protection Strategic Objective developed.
117. Recommendation 4: In collaboration with COM, ATB/ENV should develop and implement a comprehensive external communication plan/mechanism on the environmental impacts of aviation and contributions of ICAO to environmental protection. To the extent possible, this work should leverage existing communication resources developed by ICAO partners. (Linked to finding 9 and conclusion 5).



Priority	Time Implication	Resource Implication
Medium	June 2026	Low

#### Closing criteria

- External communication plan/mechanism on environmental protection work developed.
118. Recommendation 5: The Secretariat should develop a comprehensive stakeholder engagement and strategic partnerships mechanism for Regional Offices to facilitate sector-wide work coordination and the involvement of key non-aviation stakeholders in environmental protection work. This mechanism should outline key responsibilities and specific actions to leverage the position of ICAO Regional Offices, as UN representatives, to enable the active participation of aviation and non-aviation stakeholders in the environmental protection work. (Linked to findings 8, 9 and 13 and conclusion 5).

Priority	Time Implication	Resource Implication
High	December 2026	Medium

#### Closing criteria

- Environment stakeholder engagement and strategic partnerships mechanism developed.