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INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

ICAO Doc 9988 and State Action Plans

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JOINT ICAO/SADC SASO ENVIRONMENTAL WORKSHOP FOR SADC MEMBER STATES

Swakopmund Plaza, Namibia: 11-13 November 2025

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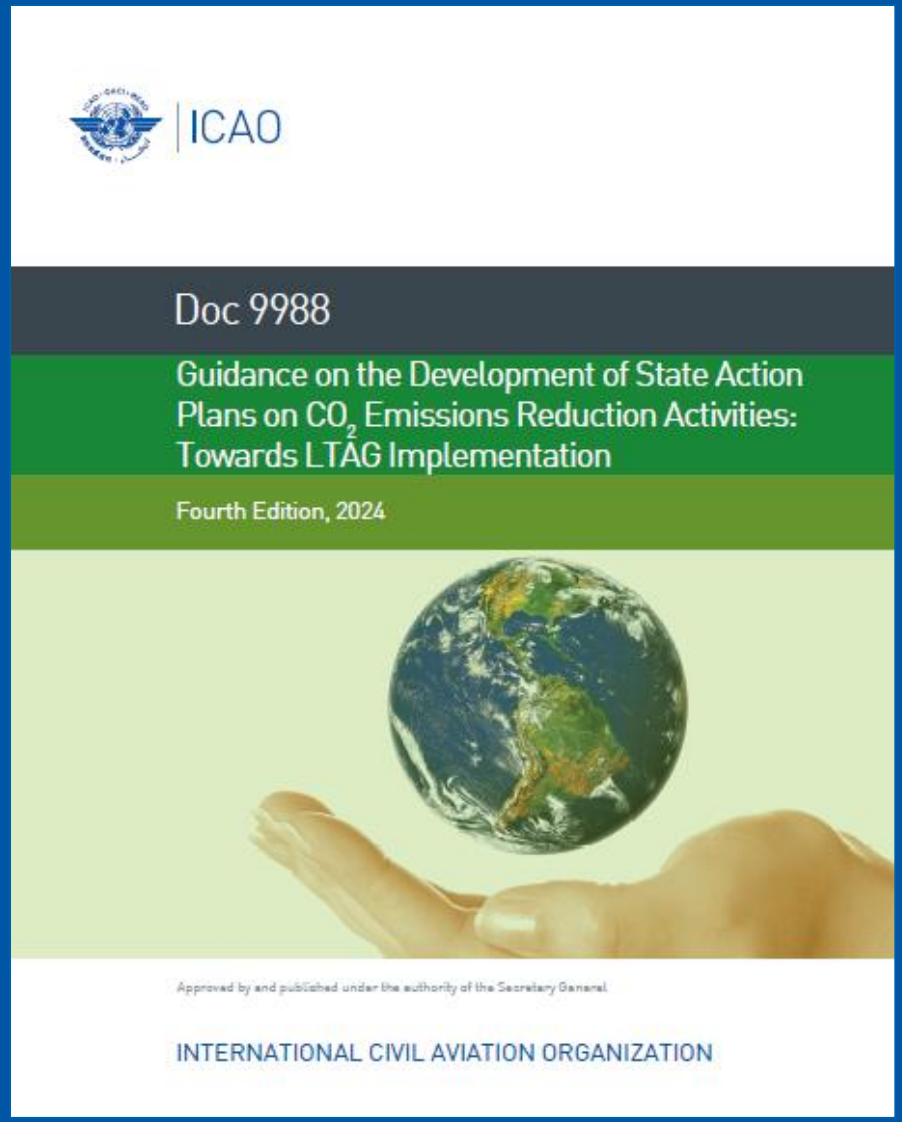
ICAO STATE ACTION PLANS INITIATIVE



Background of State Action Plan Initiative

Resolution A37-19 (2010)

Resolution A38-18 (2013)

Resolution A39-2 (2016)

Resolution A40-18 (2019)

Resolution A41-21 (2022)

Encourages States to submit and update their **voluntary action plans** outlining respective policies, actions and roadmaps, including long-term projections

(A41-21 Para. 10)

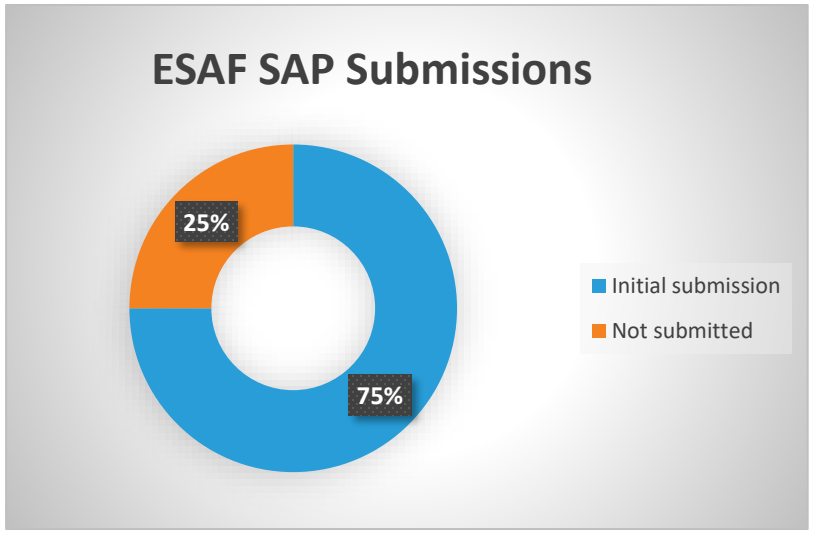
Invites States to **prepare or update** action plans to submit them to ICAO **as soon as possible preferably by the end of June 2024** and once every three years thereafter

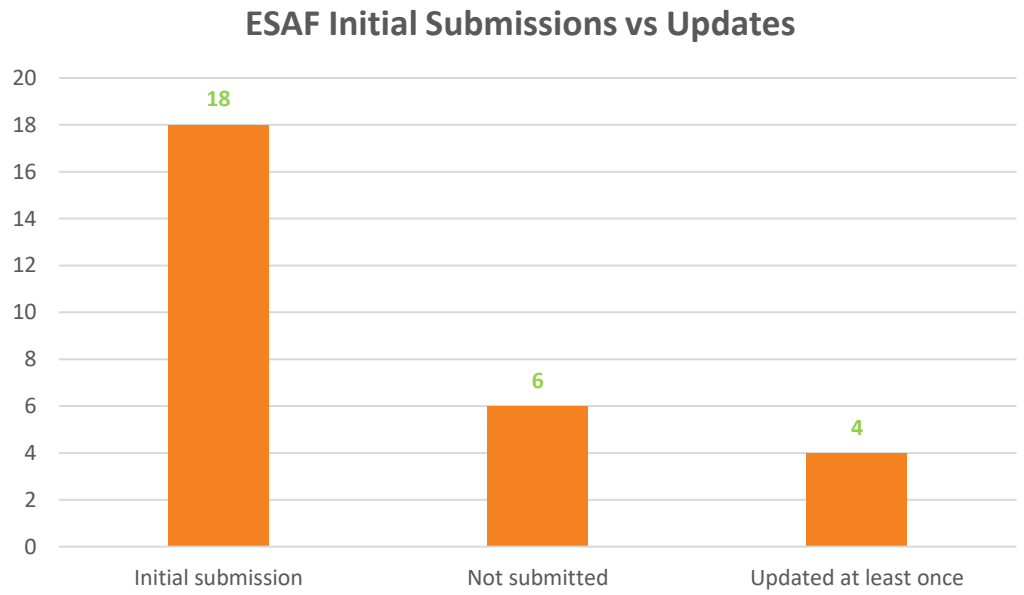
(A41-21 Para. 11)

Encourages to share information contained in action plans and **build partnerships** with other Member States

(A41-21 Para. 11)

State Action Plan Achievements – ESAF





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What is included in a State Action Plan?

5 basic elements (minimum requirements):

1- Contact Information of the State Focal Point(s).

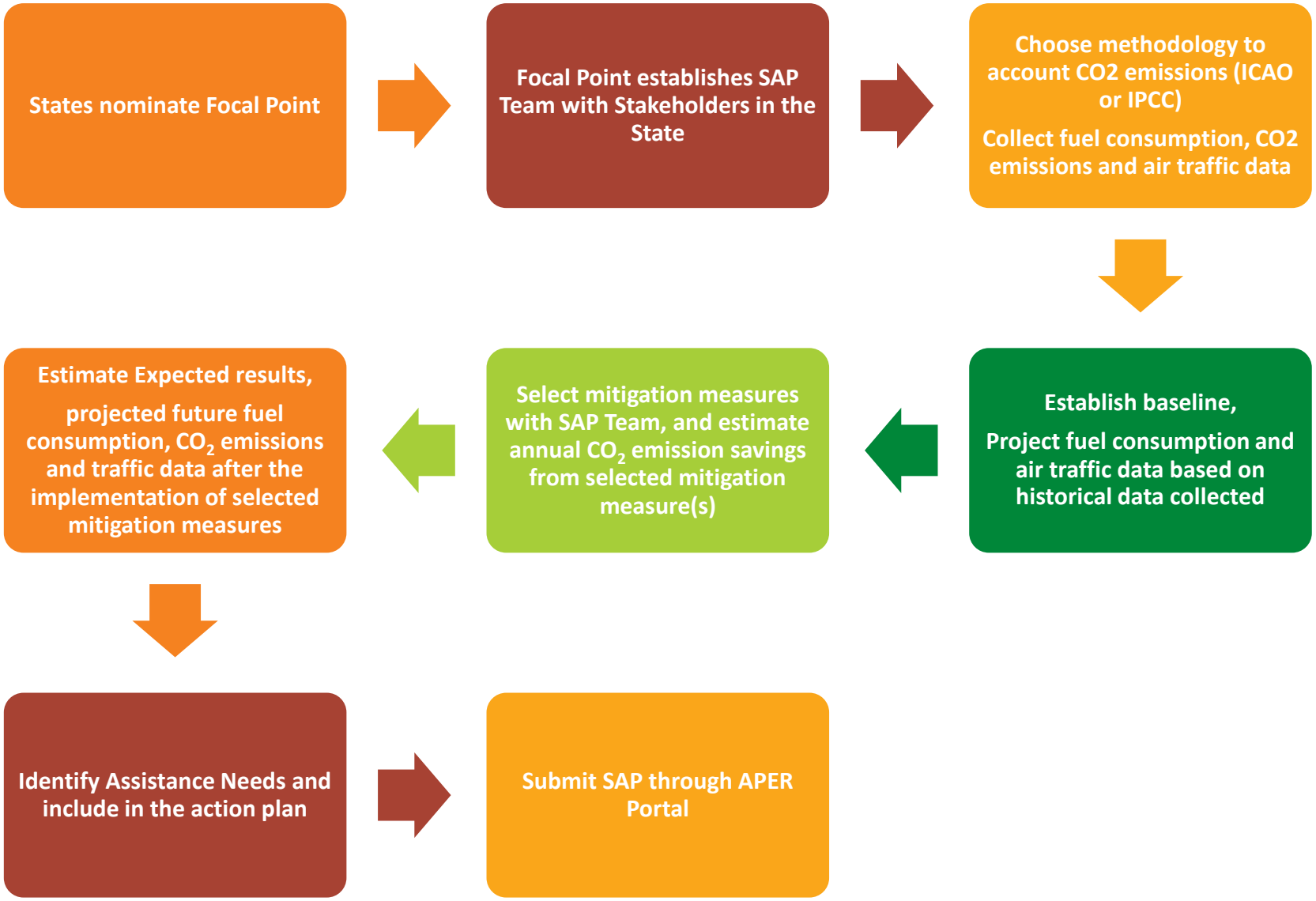
2- Baseline Scenario (scenario without action) annual fuel consumption, CO2 emissions and traffic data (from the latest available year until at least 2050).

3- Measures to mitigate CO2 emissions (deriving from the Basket of Measures) – States are encouraged to include long term projections, actions and roadmaps for SAF, LCAF, etc.

4- Expected results (scenario after taking action): annual fuel consumption, CO2 emissions and traffic data after implementation of mitigation measures from the first implementation year to at least 2050.

5- Assistance needs for example financial, technological or capacity building.

State Action Plan Process

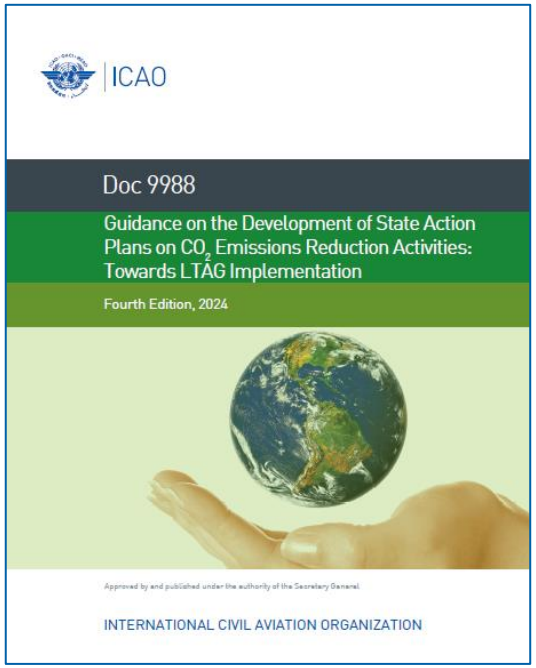


Guidance on the Development of State Action Plans on CO2 Emissions Reduction Activities (Doc 9988)

SAP Guidance update (ICAO Doc. 9988) objectives:

- provide guidance for States to incorporate their long-term emission reduction initiatives
- facilitate the LTAG monitoring with SAP data

Fourth Edition now available at APER Portal



- **Update :**
  - **Integration of latest Assembly decisions and update of sections with the latest information on mitigation measures**
  - **Additional guidance and support for States to incorporate their initiatives in SAPs and contribute to the achievement of collective ICAO global aspirational goals**
  - **High-level information on financial instruments for project implementation**
  - **New action plan template, allowing all States to report quantified data in a harmonized manner to support the aggregation of information**

ICAO STATE ACTION PLANS Doc 9988 Changes

Update ICAO Guidance Document 9988

Chapter 1 - Introduction

Reference to the new ICAO Assembly Resolution AR **41-21 Climate Change and 41-22 CORSIA**

Reference to LTAG - collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement's temperature goal (Resolution A41-21, operative clause 7)

Link between SAP and LTAG - Operative clause 9 of Resolution A41-21 "Requests Council to regularly monitor progress on the implementation of all elements of the basket of measures towards the achievement of the LTAG including through: […] monitoring of information from State Action Plans for international aviation CO2 emissions reduction and means of implementation. Therefore, **State Action Plans will play a crucial role for the monitoring of the progress to achieve the LTAG.**

All States to submit and update their voluntary Action Plans to ICAO to reduce CO2emissions from international aviation, outlining respective policies, actions **and roadmaps, including long-term projections**;" (operative clause 10)

Update ICAO Guidance Document 9988

Chapter 1 - Introduction

Outcomes of the CAAF/3 and Global Framework - agreeing on a collective global aspirational Vision to reduce CO_2 emissions in international aviation by 5 per cent by 2030 through the use of SAF, LCAF and other aviation cleaner energies. The ICAO Global Framework also encourages States to include their respective policies, actions and roadmaps for the development and deployment of SAF, LCAF and other aviation cleaner energies, **in their State Action Plans.

Emphasize the **benefits for the development and deployment of sustainable aviation fuels (SAF)**, lower carbon aviation fuels (LCAF) and other cleaner energy options in aviation

APER website – to submit officially the SAP to ICAO

Action Plan Template – updated to allow all States to report quantified data in a harmonized manner to support the aggregation of information

Update ICAO Guidance Document 9988

Chapter 2 - Action Plans

PURPOSE OF DEVELOPING SAPs

any measures to limit or reduce the impact of international aviation on the **global climate**, should be pursuant to the global aspirational goals agreed by the ICAO Assembly (**continuous fuel efficiency improvements, carbon neutral growth from 2020 onwards, and the LTAG of net-zero carbon emissions by 2050**), as well as the collective **global aspirational Vision to reduce CO_2 emissions in international aviation by 5 per cent by 2030** through the use of SAF, LCAF and other aviation cleaner energies.

Emphasis on the role of the SAPs for measuring LTAG progress- SAPs will be one of essential means for ICAO work to support the **implementation and monitor progress towards its achievement**.

Responsibilities:

States – to outline to ICAO their respective policies, and actions to and **roadmaps, including long-term projections**;

ICAO – to compile the **quantified** information in relation to the achievement of the global aspirational goals including the LTAG of net-zero carbon emissions by 2050;

Update ICAO Guidance Document 9988

Chapter 2 - Action Plans

SCOPE

should incorporate information **and quantified data** on activities that aim to address CO2 emissions from international aviation

CONTENTS: WHAT SHOULD BE INCLUDED IN AN ACTION PLAN?

The five basic elements (described on Box 1 of Doc 9988) and a template with the structure of an Action Plan is provided in **Appendix B**.

Important to recall the information provided in Slide 13 under introduction 2024-ICAO80.ENV.SAPv1.pptx :

- **Reference to LTAG; Link between SAP and LTAG-** *SAPs will play a crucial role for the monitoring of the progress to achieve the LTAG.*
- All States to *outline respective policies, actions* ***and roadmaps, including long-term projections***;"

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Chapter 3: BASELINE SCENARIO — ACCOUNTING FOR CURRENT AND FUTURE FUEL CONSUMPTION, CO2 EMISSIONS AND TRAFFIC DATA (SCENARIO WITHOUT ACTION)

Two main methodologies to account for the CO2 emissions from international flights:

a) *ICAO methodology*: each State reports the CO2 emissions from all international flights, which are operated only by aeroplane operators ***attributed to the State*** ; (attribution shall be determined as per Annex 16, Volume IV, Part II, Chapter 1, 1.2);

b) *IPCC methodology*: each State reports the CO2 emissions from ***all international flights departing from all aerodromes located in the State or its territories.***

Data Sources: use of air transport activity and fuel consumption data collected through ICAO Statistical Forms, e.g. Form M (http://www.icao.int/staforms). Additionally, fuel consumption and CO2 emissions data reported to States through the CORSIA MRV system, considering the CORSIA-specific MRV exemptions.

As the CORSIA MRV system does not require the reporting of the air traffic data, *it is important to* ***gather air traffic data corresponding to the flights*** *that are considered for the purpose of CORSIA* reporting of fuel consumption.

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Chapter 3: BASELINE SCENARIO — ACCOUNTING FOR CURRENT AND FUTURE FUEL CONSUMPTION, CO2 EMISSIONS AND TRAFFIC DATA (SCENARIO WITHOUT ACTION)

States must estimate annual CO2 emissions based on the total amount of fuel used for international aviation as follows:

$$TE = \sum_f FC_f \times CF_f$$

where:
TE = Total annual CO_2 emissions (in tonnes) from international aviation
FC_f = Total annual fuel consumption (in tonnes) for fuel *f*
CF_f = Conversion factor for fuel *f* (3.16 kg CO_2/kg fuel for Jet-A fuel, Jet-A1 fuel, TS-1 fuel, or No. 3 Jet fuel or 3.10 kg CO_2/kg fuel for Jet-A fuel, Jet-A1 fuel, TS-1 fuel, or No. 3 Jet fuel)

If the fuel consumption data is in volume units (for example, in litres), it must first be converted into mass units (kg) before using the above formula.
If the average fuel density is known, it should be used for the conversion; otherwise a default value of **0.8 kg/litre** should be used.

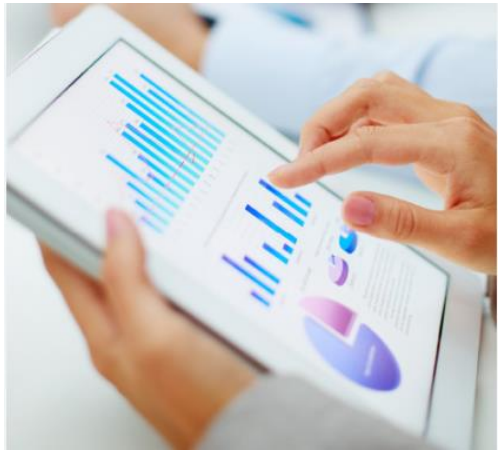
Update ICAO Guidance Document 9988

Chapter 3: BASELINE SCENARIO — ACCOUNTING FOR CURRENT AND FUTURE FUEL CONSUMPTION, CO2 EMISSIONS AND TRAFFIC DATA (SCENARIO WITHOUT ACTION)

Reporting historical data:

in the format shown in Table 3-1 (*Historical international RTK, fuel consumption and CO_2 emissions data*).

States can provide graphical representation of the data if they so wish.



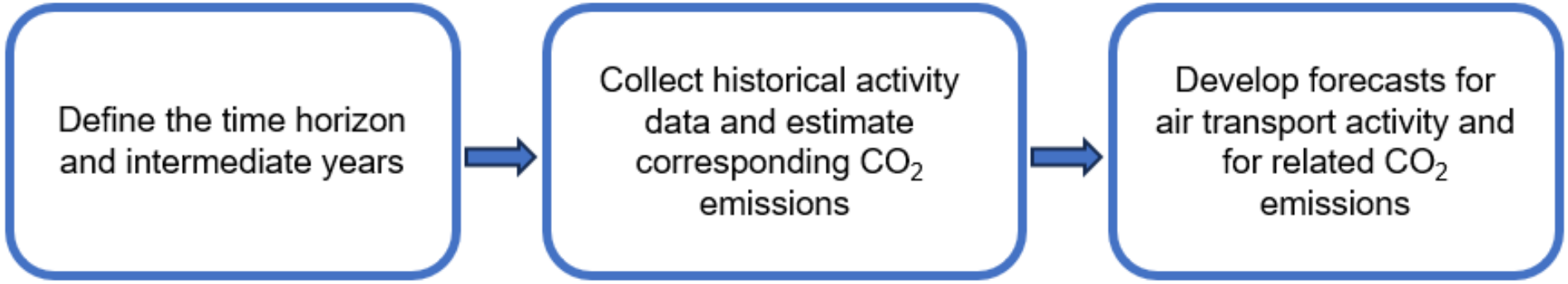
	Data required in order for an Action Plan to be considered complete by ICAO				*Optional Data*			
Year	***International RTK (tonne-kilometres)***	***International fuel consumption (litres)***	***International fuel consumption (metric tonnes)***	***International CO_2 emissions (metric tonnes)***	*Total RTK (tonne-kilometres)*	*Total fuel consumption (litres)*	*Total fuel consumption (metric tonnes)*	*Total CO_2 emissions (metric tonnes)*
Historic year								
Historic year								
Historic year								
Latest year of historical data available								

Note 1– States can report fuel consumption in either liters or metric tons. There is no requirement to report both.
Note 2—"Total" refers to the total number of international and domestic flights.

Update ICAO Guidance Document 9988

Chapter 3: FORECASTING FUTURE BASELINE TRAFFIC AND FUEL CONSUMPTION

Reporting historical data:



a) *Define the time horizon and intermediate years*- should correspond to the time horizon set by ICAO for its aspirational goals (e.g. to 2050 for the LTAG). Encouraged to also provide data for intermediate years (e.g. 2025, 2030, 2035, 2040, 2045) considering any relevant decisions by ICAO.

b) *Collect historical activity data and estimate corresponding emissions*- Historical **fuel consumption and air traffic data** from sources described in section 3.3.

c) *Develop forecasts for air transport activity and for related emissions for the baseline scenario*- ICAO's Manual on Air Traffic Forecasting (Doc 8991) provides guidance on air traffic forecasting techniques. However, States have the option to select the technique that is suitable to them.

Update ICAO Guidance Document 9988

Chapter 3: FORECASTING FUTURE BASELINE TRAFFIC AND FUEL CONSUMPTION

Addition of Table 3-2. Baseline scenario estimation methodology

Necessary that States provide clear descriptions of the **assumptions behind the baseline scenario** to **enable ICAO to compile and aggregate the submitted data**.

Definition used for international flights in the Action Plan	☐ Annex 16, Vol IV definition ☐ Other (please specify)
Does Your State have registered aeroplane operators?	☐ Yes ☐ No
Which methodology used to account for the CO_2 emissions attributed to international flights?	☐ All international flights operated by all aeroplane operators registered in your State (ICAO methodology) ☐ All international flights that depart from your State (IPCC methodology)
Brief explanation of the data collection methodology used including the origin of the fuel consumption and air traffic data.	
Timeframe Historical Data Provided	[From – To]
If EBT tool used for the baseline estimations enter the method selected from the EBT Tool	☐ Method A ☐ Method B ☐ Method C
If Method A selected from the EBT Tool, enter the number of aircrafts	
If other tools or methods used to estimate baseline, provide brief explanation	
Density of fuel used	☐ 0.8 kg/litre ☐ Other (please specify)
CO_2 conversion factor used	For Jet-A fuel, Jet-A1 fuel, TS-1 fuel, or No. 3 Jet fuel ☐ 3.16 kg of CO_2/ kg of Jet fuel ☐ Other (please specify) For AvGas or Jet-B fuel ☐ 3.10 kg of CO_2/ kg of Jet fuel ☐ Other (please specify)
Air Traffic Growth Factor used for estimations (%)	
List any other assumptions made for baseline calculations, if applicable	

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Chapter 3: FORECASTING FUTURE BASELINE TRAFFIC AND FUEL CONSUMPTION

The **Environmental Benefits Tool (EBT**), available on the APER website, can assist States to develop the baseline scenarios using three methods (A, B and C) as described in Section 3.4.9.

Important note:

Use of these methods **assumes that air traffic will continue to grow in a "business as usual" scenario**.

If the State is aware of plans that would lead to changes in the air traffic in the State, e.g introduction of new aeroplane operators or the discontinuation of existing services, *these plans should be accounted for and explained in the Action Plan*.

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Chapter 3: FORECASTING FUTURE BASELINE TRAFFIC AND FUEL CONSUMPTION

	Data required in order for an Action Plan to be considered complete by ICAO				*Optional Data*			
Year	***International RTK (tonne-kilometres)***	***International fuel consumption (litres)***	***International fuel consumption (metric tonnes)***	***International CO_2 emissions (metric tonnes)***	*Total RTK (tonne-kilometres)*	*Total fuel consumption (litres)*	*Total fuel consumption (metric tonnes)*	*Total CO_2 emissions (metric tonnes)*
Historic year								
Historic year								
Future year								
Future year								
Future year								
2050								

Note 1 – Annual data should be provided for all future years up to at least 2050, including the historic years involved in the estimation.
Note 2– States can report fuel consumption in either liters or metric tons. There is no requirement to report both.
Note 3 – If the average fuel density is known, it should be used; otherwise, a conversion factor of 0.8 kg/litre should be assumed for the fuel density.
Note 4 – Grey shaded area shows the data required in order for an Action Plan to be considered complete by ICAO.
Note 5 –"Total" refers to the total number of international and domestic flights.

Once complete, the final baseline scenario should be included into an Action Plan and uploaded onto the APER portal in the format shown in **Table 3-5**.

States could also provide graphical representations of the data in their Action Plans, if they so wish.

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Chapter 3: REVIEW OF DATA

If the source of the fuel consumption and traffic data used for the State Action Plan **has not been subject to auditing, validation or verification**, it is **recommended to conduct an internal review prior to including this data in the Action Plan and submitting to ICAO** .

Examples of data review include:

a) comparison of current data to historical activity data or modelled results;

b) review of the share of international and domestic traffic and fuel consumption;

c) review of trends in efficiency indicators such as fuel per RTK; and

d) cross-check with other available data sources. *E.g. fuel uplift could be cross-checked with jet fuel concessionaires at each airport, or departure data could be checked with the airport authorities or with schedules filed with the CAA of the State.*

In addition, the ICAO Secretariat **will review all data submitted and any inconsistencies will be brought to the attention of the State Action Plan Focal Point**.

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Chapter 4 SELECTION OF MEASURES AND QUANTIFYING THEIR EXPECTED RESULTS

SCOPE

*Action Plans should include **information on the basket of measures considered by States**, reflecting respective national capacities and circumstances, quantified information on the expected environmental benefits from the implementation of the measures chosen from the basket, and information on any specific assistance needs. AR 41-21*

Basket of Measures – Updated in the new Guidance

- **aircraft technology**

States are encouraged to incorporate details in their Action Plans concerning the present implementation status or forthcoming implementation strategies for the technological measures – Including Research and Development, Retrofit and Fleet Modernization Programmes, Technology Roadmap or Strategy, Policies, etc.

Update ICAO Guidance Document 9988

Chapter 4 SELECTION OF MEASURES AND QUANTIFYING THEIR EXPECTED RESULTS

- **sustainable aviation fuels and cleaner energies**

States are encouraged to include their respective policies, actions and roadmaps for the development and deployment of SAF, LCAF and other aviation cleaner energies

This guidance aims at providing the elements that should be included into the Action Plans, which will allow ICAO to monitor progress, and support States in building their national roadmap if needed.

States are encouraged t**o include their respective policies, actions and roadmaps** for the development and deployment of SAF, LCAF and other aviation cleaner energies

Information on the CORSIA Eligible Fuels – Sustainability Criteria for the Fuels – Annex 16 vol.3 and Box 3 of the Guidance

Update ICAO Guidance Document 9988

Chapter 4 SELECTION OF MEASURES AND QUANTIFYING THEIR EXPECTED RESULTS

- **operational improvements**;

Additional information on Airport Operations; Airport Infrastructure Improvements

- **market-based measures and CORSIA**.

In a State's Action Plan, the participation of the State in CORSIA offsetting can be selected as one mitigation measure for the period 2021-2035.

Quantifying the Effects on Fuel Consumption and CO_2 emissions from the Measures Selected

- To facilitate the assessment of the Action Plan by ICAO, States should quantify the expected benefits of each selected mitigation measure
- ***If an existing Action Plan is being updated***, the list of mitigation measures selected and expected results should be updated as well.

Update ICAO Guidance Document 9988

Chapter 5 IMPLEMENTATION, ASSISTANCE AND FINANCING

Implementation: States are encouraged to establishing an **appropriate progress tracking system** for monitoring the implementation of all mitigation measures selected, including tracking any additional new projects to reduce CO2 emissions from international aviation that are planned or started after the Action Plan has been submitted.

- Identifying monitoring and reporting tools
- Ensuring continuous consultation and coordination between stakeholders
- Adopting the appropriate policy and regulatory framework

If an existing Action Plan is being updated; a State should provide information on implementation status and/or rate of selected mitigation measures since the previous submission and emission reductions achieved through the implementation of mitigation measures

Assistance : Since the beginning of Action Plans initiative, ICAO has been providing comprehensive capacity-building and assistance strategy to support Member States.

Tools, guidance documents, disseminating latest information, etc.

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Chapter 5 IMPLEMENTATION, ASSISTANCE AND FINANCING

Assistance : Assistance, Capacity-building and Training (“ACT”) Programmes

ACT CORSIA, ACT SAF and relevant documents and online training courses, ICAO Buddy Partnerships on State Action Plans

facilitating ACCESS to financing : Several financial tools and mechanisms can be utilized to implement aviation CO_2 emission reduction projects.

Reference to the Guidance document on “**Financing Aviation Emissions Reductions** and the ICAO public website on **Climate Change Financing**.

Add a new table with examples of general conditions, requirements and eligibility criteria for decarbonization measures and projects to be accepted by financial institutions

Information on ICAO's role to in facilitating access to financing aviation decarbonization in particular, raising awareness of financial institutions, including on the investments needs to scale-up SAF production capacity

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Appendix B Template for SAP

Template was completely updated to facilitate quantified submissions

- information to provide when developing a baseline
- A draft table for the historical data -Historical international RTK, fuel consumption and CO2 emissions data
- A draft table for the baseline estimation per year
- A new table for the List of mitigation measures selected for implementation – to be quantified
- A draft table for the expected results per year
- A new table to better describe/ categorize the assistance needs

Update ICAO Guidance Document 9988

Appendix D Reference Material

This Appendix includes a set of reference material from various sources that may be relevant for States in the identification, selection and implementation of mitigation measures in their Action Plans

Entirely updated with new material

New sections:

- ICAO Tracker Tools and Stocktaking Events
- Roadmaps for the implementation of measures
- Emissions inventory preparation

Update ICAO Guidance Document 9988

Appendix G - Criteria to assess the quantification level of an action plan

the aim is to ensure that the ICAO Secretariat provides the Action Plan Focal Points with information and feedback pertaining to their State Action Plans, a set of criteria for assessing the quantification level of each Action Plan is developed.

BASELINE SCENARIO SECTION

Fully quantified Baseline should include:

1) Detailed information related to baseline estimation methodology (Please see Table – 2.1 in Appendix B)
2) Table showing the annual historical fuel consumption, CO_2 emissions and traffic data for international aviation (Please see Table – 2.2 in Appendix B) - graphical representation is optional
3) Table showing the annual projected RTK, fuel burn, CO_2 emissions data up to at least 2050 for each year (Please see Table – 2.3 in Appendix B - graphical representation is optional)

Examples of Cases	Quantification Level
All provided	Fully Quantified
If only historical data provided but no projection made	Partially Quantified
If baseline projected with CO_2, fuel burn, and RTK data for each year up to at least 2050 but shown with graph only	Partially Quantified
If baseline is projected but missing any of the CO_2, fuel	Partially Quantified

EXPECTED RESULTS SECTION

Fully quantified Expected Results should include:

1) Table showing the projected fuel consumption, CO_2 emissions and traffic data after the implen selected mitigation measures should be reported in a table for each year up to at least 205(representation is optional). (Please see Table– 4.1 in Appendix B).

Examples of Cases	Quantification Level
All provided	Fully Quantified
If expected results projected but shown with a graphical representation, but without data	Partially Quantified
If the provided data table does not include the data for each year up to at least 2050	Partially Quantified
If expected results missing any of the CO_2, fuel burn, and RTK data	Partially Quantified

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Appendix H Template Feedback Form

Through the State Feedback Form, as provided in this Appendix, the ICAO Secretariat communicates possible areas of improvements,

The **Baseline Scenario**, the **Mitigation Measures**, and the **Expected Results Sections** in the Action Plan need t**o be fully quantified** in order for a State Action Plan to be aligned with the ICAO Guidance Document Doc 9988.

EXPECTED RESULTS SECTION	
Fully quantified Expected Results should include: 1) Table showing the projected fuel consumption, CO_2 emissions and traffic data after the implementation of selected mitigation measures should be reported in a table for each year up to at least 2050 (graphical representation is optional). (Please see Table– 4.1 in Appendix B).	
Examples of Cases	**Quantification Level**
All provided	Fully Quantified
If expected results projected but shown with a graphical representation, but without data	Partially Quantified
If the provided data table does not include the data for each year up to at least 2050	Partially Quantified
If expected results missing any of the CO_2, fuel burn, and RTK data	Partially Quantified

Information provided in State Action Plans

The quantifiable data reported by States within action **plans enables ICAO to assess the collective global contribution of State's individual plan toward the achievement of the global aspirational goals.** For the assessment, ICAO needs to aggregate the quantified data from the action plans. Categorization of action plans:

With Data	Partial Data	No Data
• Quantified data provided for Baseline • Quantified annual fuel burn reduction/CO2 emission reductions from the selected mitigation measure(s) • Quantified data provided for Expected Results	• Only historical data provided • Projected data for only one or two of the following categories: CO_2, fuel burn, and RTK data • With a graphical representation, but without data	• No baseline scenario • No mitigation measures selected • No expected results

After Submission

- Development and submission of an Action Plan is not the end goal
- Key points:
  - ✓ States to set in motion a process to implement the relevant measures in the Action Plan
  - ✓ Continuous consultation and coordination between the various stakeholders is essential for implementation
  - ✓ States to contribute to the achievement of the LTAG in accordance with national circumstances
  - ✓ States to continue to work closely with ICAO to achieve the implementation of the Global Framework for SAF, LCAF and other cleaner energies

- States are invited to update their SAP as soon as possible and contact the Regional Offices for any support

Questions?

Thank you...

Thank You

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